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How to Read the Course Descriptions

This section contains complete information for all UAF courses. Unless otherwise indicated, course frequency refers to the offering of courses at the Fairbanks campus. The courses listed in this catalog are not offered at all UAF sites but may be offered if demand warrants and qualified faculty are available.

Courses are regularly offered at Bristol Bay Campus at Dillingham, Chukchi Campus at Kotzebue, Kuskokwim Campus at Bethel and Northwest Campus at Nome. Through the Interior-Aleutians Campus, courses are available at Fort Yukon, Galena, McGrath, Nenana, Tok and Unalaska. Information about the frequency of courses at these community sites can be obtained from the local UAF representative.

Course Numbers

The first numeral of a course numbered in the hundreds indicates the year in which a student typically takes the course. For example, ENGL F111X is usually for first-year students and ENGL F318 is for third-year students. Freshman and sophomore students are cautioned to register for upper-division (300- and 400-) level courses only if they have adequate preparation and background to undertake advanced study in the field in which those courses are offered.

000-049—Non-credit courses

050-099—Developmental courses

Developmental courses are preparatory courses that do not apply to associate, baccalaureate or graduate degree requirements.

100-299—Lower-division courses

300-499—Upper-division courses

Freshman and sophomore students may be required to obtain special permission to take 300- and 400-level courses unless the courses are required in the first two years of their curriculum as printed in this catalog.

500-599—Post-baccalaureate professional courses

500-level courses are intended as post-baccalaureate experiences for professionals to continue their education at a level distinct from graduate level education. 500-level special topics and independent study courses (593, 595, 597) do not apply toward any degree, certification or credential program. 500-level courses are not interchangeable with 600-level courses for graduate degree programs.

600-699—Graduate Courses

A few well-qualified undergraduates may be admitted to graduate courses with approval of the instructor. Students may not apply such a course to requirements for both a baccalaureate and a graduate degree.

STACKED AND CROSS-LISTED COURSES

Some courses are offered by an interdisciplinary program (such as Women's Studies) with a specific disciplinary content (e.g., History). Some courses containing interdisciplinary content are sponsored by several departments (e.g., Theatre/Art/Music F200X). These courses are "cross-listed" and are designated in the class listings by "*cross-listed with____*."

Courses are also sometimes offered simultaneously at different levels (for example: 100/200 or 400/600) with the higher level credit requiring additional effort and possibly a higher order of prerequisites from students. Such courses are referred to as "stacked" and are designated in the class listings by "*stacked with ___*." In the case of 400/600-level stacked courses, graduate student enrollment and a higher level of effort and performance is required on the part of students earning graduate credit.

Courses simultaneously stacked and cross-listed are designated in the class listing as "*Stacked with____ and cross-listed with____*."

For all stacked courses, the course syllabus (not the catalog) must stipulate course content and requirements for each level. The catalog should indicate the difference in prerequisites for each level.

Graduate students may not take any 600-level courses for credit if they have already received 400-level credit for that course in their undergraduate work. Individual exceptions to this rule include those courses where there has been a major shift in focus, and should be judged by the instructor and the department.

SPECIAL OR RESERVED NUMBERS

Courses with the suffix X (ENGL F111X, MATH F103X), meet specific baccalaureate core requirements. Courses with suffixes W or O meet upper-division writing intensive or oral communication intensive course requirements for the baccalaureate core.

Courses identified with numbers ending in -92 are seminars, covering various topics which may include group discussions and guest speakers; ending in -93 are special topics courses, normally offered one time only; -94, trial courses, offered in anticipation of becoming a permanent course; -95, special topics summer session courses, offered only during the summer; -97, individual study in subject areas not normally available; -98, non-thesis research/project, preparing for professional practice; and -99, thesis/dissertation, preparing for scholarly or research activity.

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Courses identified with these special or reserved numbers may be available at all levels (e.g., 193, 293, 393, etc.) at the discretion of any department, although offerings above the level of approved programs must be approved in advance by the Provost (e.g., 600-level offerings in areas without approved graduate programs or 300- and 400-level courses in areas without approved baccalaureate programs). These courses may be repeated for credit.

Course Credits

One credit represents satisfactory completion of 800 minutes of lecture, 1,600 or 2,400 minutes of laboratory (or studio or other similar activity), whichever is appropriate. (It is understood that an average student will be expected to spend 1,600 minutes of study and preparation outside of class in order to meet the learning objectives for the unit of credit in lecture.)

The following standards establish the minimum requirements for an academic unit of credit:

1. 800 minutes of lecture (plus 1,600 minutes of study)
2. 1,600 or 2,400 minutes of laboratory (or studio or other similar activity)
3. 2,400–4,800 minutes of supervised practicum
4. 2,400–8,000 minutes of internship (or externship, clinical)
5. 2,400–4,800 minutes of supervised scholarly activity

Credit hours may not be divided, except half-credit hours may be granted at the appropriate rate. For short courses and classes of less than one semester in duration, course hours may not be compressed into fewer than three days per credit. Any course compressed to less than six weeks must be approved by the college or school's curriculum council. Furthermore, any core course compressed to less than six weeks must be approved by the core review committee.

Following the title of each course, the number of credits is listed for each semester. Thus "3 credits" means three credits may be earned. Credit may not be given more than once for a course unless the course has been designated as repeatable for credit. Figures in parentheses at the end of course descriptions indicate the number of lecture; laboratory; and practicum, internship or scholarly activity hours the class meets each week for one semester. The first number represents lecture hours; the second, laboratory; and the third, practicum, internship or scholarly activity. For example (2+3) indicates that a class has two hours of lecture and three of laboratory work each week. A designation of (1+0+6) indicates that the course meets for one hour each week of lecture and 6 hours each week of practicum, internship or other scholarly activity.

Identifying Courses

X—The Baccalaureate Core

Courses used to satisfy general baccalaureate core requirements have course numbers ending with the suffix X. For example, English F111X and Communication F141X meet specific core requirements. See baccalaureate core requirements for a listing of other specific courses.

O—Oral Communication Intensive Course
W—Writing Intensive Course

Courses meeting upper-division writing and oral communication intensive requirements for the baccalaureate core are identified in the course description section of the catalog with the suffixes O and W.

Two courses designated O/2 are required to complete the oral communication intensive requirement.

Specific Degree Requirements

Courses that may be used to satisfy specific degree requirements (e.g., humanities elective for the B.A. degree, or natural science elective for the B.S. degree) are identified in the course description section by the following degree requirement designators:

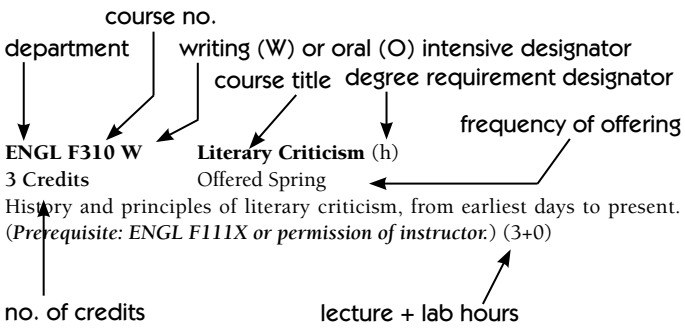
h—humanities
s—social science
m—mathematics
n—natural science

For example, you may use ANTH F309—Arctic Prehistory (s), to satisfy the "social science elective" requirement for a bachelor of arts degree. Some courses, including all special topics and individual study courses, are not given course classifications.

Course Frequency

A frequency of offering designator such as "Offered Fall" or "Offered Alternate Spring" follows many course descriptions. Every effort is made to ensure this designator is correct. However, students should review the current class schedule or check with individual departments for the most accurate and up-to-date information on future course offerings.

A Sample Course Description



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ACCOUNTING

Students enrolling in School of Management courses are expected to have completed the necessary prerequisites for each course.

A per semester student computing facility user fee will be assessed for student enrolling in one or more School oF Management courses (AIS, ACCT, BA and ECON) except ECON F100X. This fee is in addition to any materials fees.

ACCT F261 **Accounting Concepts and Uses I** (s)
3 Credits
An understanding of basic financial statements from a user perspective (investors, managers and creditors) is strongly emphasized. Topical coverage of financial and managerial issues is integrated throughout the semester. Material is presented in a fashion that promotes development of communication skills. The conceptual approach used in this course will sensitize the student to the implications of accounting decisions related to business transactions, while avoiding the detailed procedures that only accountants need to know. ***Prerequisites: Sophomore standing or higher; placement, concurrent enrollment, or completion of MATH at the F100-level or above.*** (3+0)

ACCT F262 **Accounting Concepts and Uses II**
3 Credits
Continuation of ACCT F261 with introduction of advanced topics. ***Prerequisites: ACCT F261.*** (3+0)

ACCT F263 **Accounting Processes**
1 Credit
Laboratory covering processes and procedures of accounting. Includes journals, ledgers and recording techniques, and understanding of contemporary accounting issues. ***Prerequisites: AIS F101; ACCT F261; ACCT F262 or concurrent enrollment in ACCT F262.*** (3+0)

ACCT F330 **Income Tax**
3 Credits Offered Fall or Spring
Survey of basic concepts of federal taxation with emphasis on taxation of individuals and the impact of taxes on business and investment planning. ***Prerequisites: ACCT F262.*** (3+0)

ACCT F342 **Managerial Cost Accounting**
3 Credits Offered Fall or Spring
Cost accounting with managerial emphasis on planning, control and decision making. Topics include cost-volume profit analysis, costing systems, profit planning, flexible budgets, standard costs, responsibility accounting, inventory costing alternatives and relevant costs for decision making. For accounting majors. Note: No credit may be earned for more than one of ACCT F342 or ACCT F352. ***Prerequisites: ACCT F262.*** (3+0)

ACCT F352 **Management Accounting**
3 Credits Offered Fall or Spring
Business policy profit planning, resource planning, control concepts, reporting for management control and impact of public reporting on management decisions. Note: For non-accounting majors only. No credit may be earned for more than one of ACCT F342 or ACCT F352. ***Prerequisites: ACCT F261; ACCT F262.*** (3+0)

ACCT F356 **Internship in Accounting**
1-3 Credits Offered as Demand Warrants
Supervised accounting work experience in an approved position related to the student's career interests. Number of credits earned depends upon the type of position and time worked. No student may count more than 9 internship credits towards an undergraduate degree, with these credits being electives. Internship credits may not be taken as one of the two required senior-level accounting electives. ***Prerequisites: Permission of the SOM advisor.*** (0+6-14)

ACCT F361 **Intermediate Accounting**
3 Credits Offered Fall
Discussions of financial accounting topics from the perspective of both accounting practice and theory. Working capital and fixed asset accounts are emphasized. Ethical and international accounting issues are emphasized throughout the sequence. ***Prerequisites: ACCT F262.*** (3+0)

ACCT F362 **Intermediate Accounting**
3 Credits Offered Spring
Discussion of financial accounting topics from the perspective of both accounting practice and theory. Long-term liabilities and stockholders equity are emphasized. Ethical and international accounting issues are emphasized throughout. ***Prerequisites: ACCT F361.*** (3+0)

ACCT F401 **Advanced Accounting**
3 Credits Offered Fall or Spring
Accounting for business combinations: parent-subsidiary and home office/branch relationships, partnerships and multinational enterprises. ***Prerequisites: ACCT F362.*** (3+0)

ACCT F404 **Advanced Cost Accounting and Controllership**
3 Credits Offered Fall or Spring
Study of the controllership function with emphasis on advanced cost and managerial accounting topics related to contemporary organizations. ***Prerequisites: ACCT F342.*** (3+0)

ACCT F414 **Governmental and Nonprofit Accounting**
3 Credits Offered Fall or Spring
Accounting for governmental units, public schools, colleges and universities, health care providers, voluntary health and welfare organizations and other nonprofit organizations. ***Prerequisites: ACCT F361.*** (3+0)

ACCT F430 **Advanced Taxes**
3 Credits Offered Fall or Spring
Advanced study of income taxation, emphasizing federal taxation of corporations and partnerships. ***Prerequisites: ACCT F330.*** (3+0)

ACCT F452 W **Auditing**
3 Credits Offered Fall or Spring
Introduction to the professional standards and procedures applicable to an auditor's examination of financial statements. Compliance and Operational auditing, ethical and legal responsibilities, and international auditing issues emphasized. ***Prerequisites: ACCT F362; AIS F316; ENGL F111X; ENGL F211X or ENGL F213X.*** (3+0)

ACCT F472 **Advanced Auditing**
3 Credits Offered Fall or Spring
Advanced auditing theory and practice. Audit techniques and internal controls. Evaluation of computer systems. Includes contemporary topics, governmental auditing, federal and state single audits. For auditor practitioners and students without field experience in auditing. ***Prerequisites: ACCT F452.*** (3+0)

ACCT F602 **Accounting for Managers**
3 Credits Offered Fall or Spring
A complete and balanced treatment of the concepts, procedures and uses of financial accounting. Coverage includes the accounting cycle, accounting principles, mass processing of transactions, internal control, inventories and merchandising operations, long-lived assets and liabilities, corporate accounting and reporting, partnership accounting, financial statements, funds flow analysis, cost systems for manufacturing operations, and managerial accounting. ***Prerequisites: Graduate standing; or approval of the M.B.A. director.*** (3+0)

ACCT F605 **Contemporary Topics in Accounting**
3 Credits Offered Fall or Spring, As Demand Warrants
An advanced seminar designed to meet the accounting needs of managers. These topics can range from taxes to management control systems. May be taken twice for credit when topic changes. ***Prerequisites: ACCT F602; graduate standing; or permission of the M.B.A. director.*** (3+0)

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ACCT F656 **Internship in Accounting**
1-3 Credits Offered as Demand Warrants
Supervised accounting experience in an approved position related to the student's career interests. (Note: Number of credits earned depend on the type of position and time worked. No graduate student may count more than six internship credits towards a graduate degree with these credits being electives.) ***Prerequisites: M.B.A. standing or approval of MBA director.*** (0+6-14)

ACCOUNTING AND INFORMATION SYSTEMS

Students enrolling in School of Management courses are expected to have completed the necessary prerequisites for each course.

A per semester student computing facility user fee will be assessed for student enrolling in one or more School of Management courses (AIS, ACCT, BA and ECON) except ECON F100X. This fee is in addition to any materials fees.

AIS F101 **Effective Personal Computer Use**
3 Credits
Using and understanding advanced computing software applications. Course develops conceptual and practical knowledge of advanced presentation/communications software, database programs and operating systems. (3+0)

AIS F224 **Advanced MS Excel**
1 Credit Offered as Demand Warrants
Advanced features of the Microsoft Excel spreadsheet program. Includes spreadsheet design and layout, customized graphics, customized reports using database features, optimization/statistical techniques and programming with the Excel macro language. ***Prerequisites: AIS F101 or permission of instructor. Student is assumed to have basic proficiency with Microsoft Excel.*** (1+0)

AIS F225 **Windows Networking and Administration**
1 Credit Offered as Demand Warrants
Network engineering skills required to implement and support the Microsoft Windows OS. Includes installation, configuration, peer-to-peer networking, interoperability with Novell Netware, tuning and troubleshooting. ***Prerequisites: AIS F101; Experience using the Microsoft Windows OS; or permission of instructor.*** (1+0)

AIS F310 **Management of Information Systems**
3 Credits
The role information technology plays in organizations including its impact on information systems, management and business strategy. A conceptual model of system design is introduced and basic business internal controls are surveyed. ***Prerequisites: AIS F101.*** (3+0)

AIS F312 W **Information Systems Technology**
3 Credits Offered as Demand Warrants
Introduction to the hardware and systems software underlying information systems; provides background to understand computer marketing literature and to select among technology alternatives. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X.*** (3+0)

AIS F316 **Accounting Information Systems**
3 Credits Offered Fall or Spring
Accounting systems for business and public entities. Emphasis on internal control functions and design concepts. ***Prerequisites: AIS F101; ACCT F262.*** (3+0)

AIS F410 **Systems Analysis and Program Design**
3 Credits Offered as Demand Warrants
The system development life cycle for database-oriented information systems in both mainframe and microcomputer environments. Includes programming in one or more fourth-generation languages and a term project. ***Prerequisites: AIS F310 or AIS F312.*** (3+0)

AIS F414 **Database Design for Management Information**
3 Credits Offered as Demand Warrants
Combines advanced systems analysis using modern techniques of data modelling with study of management and administrative problems in coordination and management of organization data resources; focusing on needs of medium-sized and large organizations. ***Prerequisites: AIS F310 or CS F401.*** (3+0)

AIS F673 **Technology Management**
3 Credits Offered as Demand Warrants
Overview of the skills a manager needs to administer an information systems department, including extensive discussions of current trends in management of IS and the IS industry. ***Prerequisites: Graduate standing or approval of the M.B.A. director.*** (3+0)

AIRFRAME AND POWERPLANT

AFPM F111 **General Airframe and Powerplant**
3 Credits Offered as Demand Warrants
Shop practices, basic math, applied physics, FAA regulations, basic electricity, aircraft weight and balance, ground operations and servicing, cleaning and corrosion control, and materials and process. Preparation for the FAA Mechanics Airframe Structures Written, Oral and Practical Exam. Special fees apply. ***Prerequisites: Experience requirements of FAR 65.77 or permission of instructor.*** (3+0)

AFPM F145 **Basic Mathematics**
1 Credit Offered as Demand Warrants
Review of applied and technical mathematics related to the construction and engines of aircrafts. Common, decimal, fractions and mixed numbers; extracting square roots and raising numbers to a given power; solving ratios, proportions and percentage problems; fundamental algebraic operations. Special fees apply. ***Prerequisites: Admission to Airframe & Powerplant program or permission of instructor.*** (1+0)

AFPM F146 **Basic Electricity**
2 Credits Offered as Demand Warrants
Electrical theory and concepts for the aviation mechanic. Ohm's law, electrical circuits, diagrams, batteries and a variety of electrical components. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (2+0)

AFPM F147 **Physics for Mechanics**
0.5 Credit Offered as Demand Warrants
Applications of mechanics; levers, sound, fluid and heat dynamics. Basic aircraft structures and aerodynamics. (Course does not fulfill natural science requirements for any degree.) Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (0.5+0)

AFPM F148 **Aircraft Drawing**
1 Credit Offered as Demand Warrants
Basic drafting. Drawings, symbols and schematic diagrams, sketches of repairs and alterations, blueprint information, graphs and charts. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (1+0)

AFPM F149 **Fluid Lines and Fittings**
0.5 Credit Offered as Demand Warrants
Rigid and flexible fluid lines and fittings, fabrication and installation. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (0.5+0)

AFPM F150 **Materials and Processes**
2 Credits Offered as Demand Warrants
Basic shop practices, including selection, identification and installation of aircraft hardware and materials, precision measuring tools and operations, basic heat treating processes, forms of nondestructive inspections. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (2+0)

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AFPM F151 Cleaning and Corrosion Control
1 Credit Offered as Demand Warrants
Basic aircraft cleaning materials, methods and corrosion control. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (1+0)

AFPM F152 Federal Aviation Regulations
1 Credit Offered as Demand Warrants
Federal Aviation Regulations for maintenance of aircraft. Maintenance forms and records, publications, privileges and limitations of aircraft mechanics. Also available through the Center for Distance Education. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (1+0)

AFPM F153 Weight and Balance
1 Credit Offered as Demand Warrants
Weighing procedures, weight, arms, moments, center of gravity computations and placarding. Aircraft loading, required forms, weighing. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (1+0)

AFPM F154 Ground Operations and Servicing
0.5 Credit Offered as Demand Warrants
Starting, moving, servicing, securing and fueling aircraft. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (0.5+0)

AFPM F205 Airframe Structures
3 Credits Offered as Demand Warrants
Aircraft wood, dope, fabric finishes, welding, sheet metal, assembly and rigging and inspection. Preparation for the FAA Mechanics Airframe Structures written, oral and practical exam. Special fees apply. ***Prerequisites: Experience requirements of FAR 65.77 or permission of instructor.*** (3+0)

AFPM F206 Airframe System and Components
2 Credits Offered as Demand Warrants
Aircraft electrical, hydraulic and pneumatic systems. Landing gear, instruments, fuel, communication and navigation, cabin atmosphere control, and fire protection systems. Inspection, checking, troubleshooting, repair and servicing. Preparation for the FAA Mechanics Airframe Structures written, oral and practical exam. Special fees apply. ***Prerequisites: Experience requirements of FAR 65.77 or permission of instructor.*** (2+0)

AFPM F215 MOS Powerplant Theory/Maintenance
2 Credits Offered as Demand Warrants
Jet engine fundamentals, analysis and testing. Inspecting turbo jets, turbo shaft and turbo fan engines. Overhaul, inspection and fundamentals of reciprocating engines. Preparation for the FAA Mechanics Airframe Structures written, oral and practical exam. Special fees apply. ***Prerequisites: Experience requirements of FAR 65.77 or permission of instructor.*** (2+0)

AFPM F216 MOS Powerplant System/Components
3 Credits Offered as Demand Warrants
Fuel metering, induction systems, propellers, control systems and powerplant electricity. Repair, inspection, service and troubleshooting. Preparation for the FAA Mechanics Airframe Structures written, oral and practical exam. Special fees apply. ***Prerequisites: Experience requirements of FAR 65.77 or permission of instructor.*** (3+0)

AFPM F230 Aircraft Electrical Systems
2.5 Credits Offered as Demand Warrants
Wiring, control, indication and protection devices for AC and DC systems. Inspection, troubleshooting service and repair of these systems. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (2.5+0)

AFPM F231 Powerplant Electrical Systems
1.5 Credits Offered as Demand Warrants
Installation, inspection, testing, servicing engine electrical system wiring, controls, indicators and protective devices. Repair and service of electrical generating systems. Special fees apply. (1.5+0)

AFPM F235 Aircraft Reciprocating Engines
4.5 Credits Offered as Demand Warrants
History and development of the aircraft reciprocating engine. Repair, overhaul and inspection of various types of engines. Operation and troubleshooting of engines. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (4.5+0)

AFPM F240 Turbine Engines
2 Credits Offered as Demand Warrants
Development, theory and operation of turbine engines. Engine design, performance, accessories and subsystems. Engine maintenance and overhaul. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (2+0)

AFPM F244 Lubricating Systems
1.5 Credits Offered as Demand Warrants
Identification and selection of lubricants for aircraft powerplants. Inspection, service, troubleshooting and repair of the lubrication systems and components. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (1.5+0)

AFPM F245 Ignition Systems
2 Credits Offered as Demand Warrants
Overhaul, inspection and troubleshooting of reciprocating and gas turbine ignition systems. Repair and bench testing of components. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (2+0)

AFPM F246 Fuel Metering Systems
2 Credits Offered as Demand Warrants
Fundamental operation of fuel metering systems in aircraft powerplants. Technical data to repair and overhaul carburetors and components. Inspecting, troubleshooting and adjusting turbine engine fuel metering systems and electronic fuel controls. Special fees apply. ***Prerequisites: Admission to the A & P Program or permission of instructor.*** (2+0)

AFPM F248 Induction Systems
0.5 Credit
Operation and service of aircraft induction, preheat, anti-ice and supercharger systems. Special fees apply. (0.5+0)

AFPM F249 Powerplant Cooling Systems
0.5 Credit
Inspection, service and repair of engine cooling systems - both air and liquid cooled installations. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (0.5+0)

AFPM F250 Powerplant Exhaust Systems
0.5 Credit
Inspection, service and repair of engine exhaust systems. Includes operations of turbo compounded engines, thrust reversers and noise suppressors. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (0.5+0)

AFPM F251 Fuel Systems
1.5 Credits Offered as Demand Warrants
Inspection, servicing, troubleshooting and repair of aircraft and engine fuel systems and components. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (1.5+0)

AFPM F252 Propellers
2 Credits Offered as Demand Warrants
Identification and nomenclature of aircraft propellers. Operation, control and repair of both reciprocating and turbine engine installations. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (0+0)

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AFPM F253 **Transport Category Aircraft**
1 Credit Offered as Demand Warrants
Introduction to transport category aircraft systems and components. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (1+0)

AFPM F254 **Ice and Rain Control Systems**
0.5 Credit Offered as Demand Warrants
Inspection, operation and troubleshooting of de-ice and anti-ice systems. Special fees apply. (0.5+0)

AFPM F255 **Fire Protection Systems**
0.5 Credit Offered as Demand Warrants
Inspection, servicing, troubleshooting and repair of aircraft and engine fire detection and extinguishing systems. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (0.5+0)

AFPM F256 **Communications and Navigation Systems**
0.5 Credit Offered as Demand Warrants
Operation of aircraft avionics, autopilots and antennas, including inspection and installation. Special fees apply. (0.5+0)

AFPM F257 **Instrument Systems**
0.5 Credit Offered as Demand Warrants
Inspection, troubleshooting, removal and replacement of aircraft and engine instruments and indicating systems. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (0.5+0)

AFPM F258 **Cabin Atmosphere Control Systems**
1 Credit Offered as Demand Warrants
Aircraft pressurization, air conditioning, heating and oxygen systems. Operation, inspection, troubleshooting, service and repair. Special fees apply. (1+0)

AFPM F259 **Hydraulic and Pneumatic Systems**
1.5 Credits Offered as Demand Warrants
Operation of hydraulic and pneumatic systems and uses in aircraft. Identification of hydraulic fluids, seals, hydraulic and pneumatic control devices, inspection and servicing and troubleshooting. Special fees apply. (1.5+0)

AFPM F260 **Aircraft Landing Gear Systems**
1.5 Credits Offered as Demand Warrants
Simple and complex landing gear systems. Operation, service and repair of mechanical and hydraulic retraction mechanisms. Wheel, tire and brake service. Aircraft speed and configuration warning systems, electric brake controls, anti-skid systems, landing gear position and warning systems. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (1.5+0)

AFPM F261 **Non-Metallic Structures**
1 Credit Offered as Demand Warrants
Inspection, service and repair of wood structures. Preliminary and secondary repair of interior and service of plastic, honeycomb, bonded, and composite and laminated structures. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (1+0)

AFPM F262 **Aircraft Coverings**
1 Credit Offered as Demand Warrants
Selection, application, inspection and testing of fabric and fiberglass coverings and methods of repair. Special fees apply. ***Prerequisites: Admissions to A & P Program or permission of instructor.*** (1+0)

AFPM F263 **Aircraft Finishes**
0.5 Credit Offered as Demand Warrants
Identification and selection of aircraft finishing materials. Application of paints, dopes, primers and trim. Special fees apply. ***Prerequisites: Admission to A & P Program and permission of instructor.*** (0.5+0)

AFPM F264 **Sheet Metal Structures**
3 Credits Offered as Demand Warrants
Aircraft sheet metal fabrication, inspection and repair, including rivets and fasteners. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (3+0)

AFPM F265 **Aircraft Welding**
1.5 Credits Offered as Demand Warrants
Contemporary welding methods on aircraft structures. Oxyacetylene, arc, inert gas and brazing techniques. Inspection of welded structure and safety procedures. Special fees apply. (1.5+0)

AFPM F266 **Assembly and Rigging**
1.5 Credits Offered as Demand Warrants
Aerodynamic theory and function of aircraft control surfaces. Fabrication and installation of control devices for fixed and rotary wing aircraft; jacking and control surface balance. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (1.5+0)

AFPM F267 **Airframe Inspections**
0.5 Credit Offered as Demand Warrants
Inspection and return of aircraft to service. Procedural and legal aspects of 100 hour, annual and periodic inspections. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (0.5+0)

AFPM F270 **Airframe Testing**
0.5 Credit Offered as Demand Warrants
Preparation for the Federal Aviation Administration written, oral and practical exams for the powerplant mechanics' license. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (0.5+0)

AFPM F271 **Powerplant Inspections**
0.5 Credit Offered as Demand Warrants
Methodology and record keeping for inspection of aircraft reciprocating and gas turbine engines. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (0.5+0)

AFPM F272 **Powerplant Testing**
0.5 Credit Offered as Demand Warrants
Preparation for the Federal Aviation Administration written, oral and practical exams for the powerplant mechanics' license. Special fees apply. ***Prerequisites: Admission to A & P Program or permission of instructor.*** (0.5+0)

AFPM F325 **Inspection Authorization Preparation**
2 Credits Offered as Demand Warrants
Technical background training for the working airframe and powerplant mechanic in selecting, reviewing and utilizing the appropriate federal regulatory and advisory information as well as the manufacturer's maintenance information to inspect and return to service aircraft, engines, propellers, appliances and related parts in accordance with FAR Part 65.95. Final exam is the FAA Inspection Authorization exam administered by an FAA airworthiness inspector. ***Prerequisites: FAA A & P Certificate, meet additional requirements of FAR 65.91.*** (1+2)

ALASKA NATIVE LANGUAGES

Note: Two semester-length courses in a single Alaska Native Language or other non-English language taken at the university level may replace 6 credits in the Perspectives on the Human Condition section of the Core. ANL F141-F142 may be used to meet this requirement but then may not be used to meet humanities degree requirement.

ANL F108 **Beginning Athabascan Literacy** (h)
1-3 Credits Offered as Demand Warrants
Introduction to reading and writing in one of the Athabascan languages. For speakers of the language who want to become literate. (1-3+0)

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ANL F121 **Conversational Alaska Native Language** (h)
1-3 Credits Offered Fall
Introduction to speaking and understanding one of the Alaska Native languages. Focus on communication in everyday situations. ***Note: Does not satisfy core curriculum requirements.*** (1-3+0)

ANL F122 **Conversational Alaska Native Language** (h)
1-3 Credits Offered Spring
Introduction to speaking and understanding one of the Alaska Native languages. Focus on communication in everyday situations. ***Prerequisites: ANL F121 in the same language or permission of instructor. Note: Does not satisfy core curriculum requirements.*** (1-3+0)

ANL F141 **Beginning Athabascan-Koyukon or Gwich'in** (h)
5 Credits Offered Fall
Introduction to an Alaska Athabascan language. Class will deal with one of the eleven Athabascan languages spoken in Alaska. Literacy and grammatical analysis for speakers. For non-speakers, a framework for learning to speak, read and write the language. (5+0)

ANL F142 **Beginning Athabascan** (h)
5 Credits Offered Spring
Introduction to an Alaska Athabascan language. Class will deal with one of the eleven Athabascan languages spoken in Alaska. Literacy and grammatical analysis for speakers. For non-speakers, a framework for learning to speak, read and write the language. ***Prerequisites: ANL F141 in the same language or permission of instructor.*** (5+0)

ANL F150 **Interpretive Communication** (s)
1 Credit Offered as Demand Warrants
Communication processes in Yup'ik and English speaking cultures. Solutions to identify problem areas in cross-cultural communication. Situations such as conversations, meetings, translating and interpreting. Interpreting meaning in what is communicated between people of different sociocultural backgrounds. Kuskokwim Campus only. (1+0)

ANL F151 **Interethnic Communications** (s)
3 Credits Offered as Demand Warrants
Understanding differences in cross-cultural interaction. Application of cross-cultural interactions to various communication settings. Concentrates on Yup'ik ways of communication. Kuskokwim Campus only. (3+0)

ANL F199 **Practicum in Native Language Education**
3 Credits Offered as Demand Warrants
Individualized work experience. Variable credit (depending on the quantity and quality of the work experience). Offered on campus and via distance delivery. When offered via distance delivery, a local mentor (usually principal or teacher) must be willing to work with the student on the local level. (3+0)

ANL F208 **Advanced Athabascan Literacy** (h)
1-3 Credits Offered as Demand Warrants
Expository and creative writing for native speakers; reading Athabascan literature; elicitation, transcription and editing of cultural materials from elders. (1-3+0)

ANL F221 **Intermediate Conversational Alaska Native Language** (h)
1-3 Credits Offered as Demand Warrants
Continuation of ANL F121, ANL F122. Focus on conversational skills in a particular Alaska Native language. On completion of this course the student should not only be able to function at a low level of fluency but should also have the skills necessary to increase fluency through continued use of the language. ***Prerequisites: ANL F121; ANL F122; or permission of instructor.*** (1-3+0)

ANL F241 **Intermediate Athabascan-Koyukon or Gwich'in** (h)
3 Credits Offered Fall
Continuation of beginning Athabascan-Koyukon or Gwich'in. One of these two languages will be taught. Development of conversational ability, additional grammar and vocabulary. ***Prerequisites: ANL F141 and ANL F142 in the same language or permission of instructor.*** (3+0)

ANL F242 **Intermediate Athabascan-Koyukon or Gwich'in**
3 Credits Offered Spring
Continuation of beginning Athabaskan-Koyukon or Gwich'in. One of these two languages will be taught. Development of conversational ability, additional grammar and vocabulary. ***Prerequisites: ANL F141 and ANL F142 in the same language or permission of instructor.*** (3+0)

ANL F251 **Introduction to Athabascan Linguistics** (h)
3 Credits Offered Summer, As Demand Warrants
An introduction to the linguistic structure of the Athabascan family of languages, drawing on examples from the Athabascan languages of Alaska. Writing systems, word structure, texts, and language relationships. Techniques for accessing linguistic reference materials and the role of linguistic documentation in language revitalization and language learning. (3+0)

ANL F255 **Introduction to Alaska Native Languages: Eskimo-Aleut**
3 Credits Offered as Demand Warrants
Overview of languages native to Alaska with special attention to the Eskimo-Aleut languages. Focus on a specific language or language area (optional as most relevant to a regional student body). Includes history, present and future of basic language structure, oral, linguistic and educational literature. (3+0)

ANL F256 **Introduction to Alaska Native Languages: History, Status and Maintenance**
3 Credits Offered Spring Even-numbered Years
Overview of languages native to Alaska. Focus on a specific language or language area (optional as most relevant to a regional student body). History, current status and factors affecting the future maintenance of Alaska's languages. Topics include educational policies, lexical development (including corpus planning and standardization), language status (including language maintenance and revival issues). (3+0)

ANL F287 **Teaching Methods for Alaska Native Languages** (h)
3 Credits Offered as Demand Warrants
Methodological approaches and practice in teaching Native language and literacy to both speakers and non-speakers. ***Prerequisites: Knowledge of a Native language.*** (3+0)

ANL F288 **Curriculum and Materials Development for Alaska Native Languages** (h)
3 Credits Offered as Demand Warrants
Preparation and evaluation of curriculum and classroom materials for teaching Native languages. ***Prerequisites: ANL F287; Knowledge of a Native language; or permission of instructor.*** (3+0)

ANL F289 **Practicum in Native Language Education II**
3 or 4 Credits Offered as Demand Warrants
Individualized work experience. Supervised teaching with an experienced teacher overseeing student instructional activities and assisting with the class as needed. Note: Course may be repeated once for credit. Graded Pass/Fail. ***Prerequisites: ANL F199; ANL F287; ANL F288.*** (3 or 4+0+10)

ANL F315 **Alaska Native Languages: Eskimo-Aleut** (h)
3 Credits Offered as Demand Warrants
A survey of the Native languages of Alaska, particularly Eskimo-Aleut: history, present and future, with examples of language structure, present situation and prospects as a cultural force. Open to all students. (3+0)

ANL F316 **Alaska Native Languages: Indian Languages** (h)
3 Credits Offered as Demand Warrants
A survey of all Native languages of Alaska; particularly of the Indian languages: Athabascan-Eyak-Tlingit, Haida and Tsimshian. History, present and future; examples of language structure, present situation and prospects as a cultural force. Open to all students. (3+0)

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ANL F401 **Alaska Native Language Apprenticeship** (h)
5 Credits Offered as Demand Warrants
Structured study of an Alaska Native Language. Select and work intensively with a mentor (a native speaker of the language selected). Choice of mentor requires faculty approval. Meet regularly with mentor (minimum 10 hours per week) and participate in regular training sessions to work toward fluency. Graded Pass/Fail. ***Prerequisites: One year university-level study in language of internship or permission of instructor.*** (0.5+10+10)

ANL F402 **Alaska Native Language Apprenticeship** (h)
5 Credits Offered as Demand Warrants
Structured study of an Alaska Native language. Select and work intensively with a mentor (a native speaker of the language selected). Choice of mentor requires faculty approval. Meet regularly with mentor (minimum 10 hours per week) and participate in regular training sessions to work toward fluency. Graded Pass/Fail. ***Prerequisites: ANL F401.*** (0.5+10+10)

ANL F452 **Principles of Linguistic Analysis for Alaska Native Languages**
3 Credits Offered as Demand Warrants
Systematic principles of phonology, morphology, syntax and semantics for the Athabascan-Eyak-Tlingit, Haida, Tsimshian and Eskimo-Aleut language family. This language family is central to this course; the specific Alaska Native language emphasized will be dependent on student interest. Includes exposure to a variety of references and tools available for research in Alaska Native languages and linguistics. ***Prerequisites: LING F101 or ANL F251.*** (3+0)

ANL F601 **Seminar in Language Revitalization**
3 Credits Offered as Demand Warrants
Language teaching and acquisition strategies appropriate to under-documented and less commonly taught languages. Students write an applied research proposal related to local language endangerment issues and strategies for improving teaching either at the school or community level. Emphasis on students' class presentation and research ideas. ***Prerequisites: LING F450; ANTH F451 or LING F601.*** (3+0)

ANL F608 **Indigenous Knowledge Systems**
3 Credits Offered Fall
A comparative survey and analysis of the epistemological properties, world views and modes of transmission associated with various indigenous knowledge systems. Emphasis on knowledge systems practiced in Alaska. ***Prerequisites: Graduate standing or approval of instructor.*** Cross-listed with CCS F608; ED F608; RD F608. (3+0)

ANL F651 **Topics in Athabascan Linguistics**
3 Credits Offered Fall Even-numbered Years
Graduate-level introduction to important topics in Athabascan linguistics, including both foundational literature and current research. Topics may include laryngeal features; tonogenesis; the syntax-morphology interface; argument structure; lexical semantics; and discourse. Course may be repeated once for credit with permission of instructor. ***Prerequisites: LING F601 or equivalent; graduate standing. Recommended: LING F603; LING F604.*** Cross-listed with LING F651. (3+0)

ANL F690 **Seminar in Cross-Cultural Studies**
3 Credits Offered as Demand Warrants
Investigation of current issues in cross-cultural contexts. Opportunity for students to synthesize their prior graduate studies and research. Seminar is taken near the terminus of a graduate program. ***Prerequisites: Advancement to candidacy and permission of student's graduate committee.*** Cross-listed with CCS F690; ED F690; RD F690. (3+0)

ALASKA NATIVE POLITICS

AKNP F151 **Alaska Native Claims Settlement Act**
3 Credits Offered as Demand Warrants
A general survey of the Alaska Claims Settlement Act of 1971. Historical overview of land claims of various tribes in the Lower 48 and in Alaska. Current status of regional, village and nonprofit Native corporations. Future issues related to implementation of ANCSA. Also available through the Center for Distance Education. (3+0)

AKNP F212 **Duties and Powers of Local Government**
1 Credit Offered as Demand Warrants
Development, operation and improvement of local government in Alaska. Future of local government in bush Alaska. For citizen, practitioner and advocate. (1+0)

AKNP F230 **Federal Indian Law**
3 Credits Offered as Demand Warrants
Principles of federal Indian law and the extent to which these principles apply to Alaska Natives. Foundation of principles that formed the basis of the relationship of the United States to the tribes, and development of this relationship. Legal perspective and land issues. ***Prerequisites: English placement test.*** (3+0)

AKNP F233 **Tribal Government Issues**
1 Credit Offered as Demand Warrants
Tribal governments and related issues. Political status and lawmaking, judicial and regulatory powers. Sovereignty, tribal enrollment and membership. Selected federal statutes and Indian Law affecting Alaska Native tribes. Potential role of tribal governments in planning for Alaska Natives' future defined and discussed. (1+0)

ALASKA NATIVE STUDIES

ANS F100 **Preparing for College and Student Success**
1 Credit
Presentations on time and financial management, test-taking strategies, study techniques, UAF and community resources, GPA calculation, UAF catalog information, core requirements, goal-setting and personal choices. Provides students with the information and skills necessary for a successful UAF experience. Instruction by the staff of Rural Student Services. Native leaders will be invited as regular guest speakers. (1+0)

ANS F101 **Introduction to Alaska Native Studies** (h)
3 Credits Offered as Demand Warrants
Introductory information on the Alaska Native community. Overview of significant Native issues. Review of pertinent literature and resources. (3+0)

ANS F102 **Orientation to Alaska Native Education**
2 Credits
A seminar in issues related to Alaska Native and rural education. Through weekly meetings held both on campus and in Fairbanks schools, students examine and discuss issues with Alaska Native educators on topics related specifically to rural and urban Alaska Native education. Issues include: Native ways of knowing, local control, curriculum development for small/multi-graded/rural schools, cultural differences in teaching and learning, and bilingual programs. Graded Pass/Fail. ***Prerequisites: Permission of instructor.*** Cross-listed with ED F102. (2+0)

ANS F111 **History of Alaska Natives** (s)
3 Credits Offered Fall
The history of Alaska Natives from contact to the signing of the Land Claims Settlement Act. Cross-listed with HIST F110. (3+0)

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ANS F150 **Topics in Alaska Regional Cultural History** (s)
3 Credits Offered as Demand Warrants
Cultural history of the peoples of a selected region of Alaska, which will vary depending on demand and instructor expertise. Methods including physical anthropology, ethnohistory, linguistics, archaeology, social anthropology, ethnography, ecology and climatology will be used. Includes the issues of culture-change due to Alaska Native and Euro-American contacts. ***Recommended: ANS F242.*** (3+0)

ANS F160 **Alaska Native Dance** (h)
1 Credit
Traditional Native Alaskan dancing, singing and drumming of songs from Alaska's major indigenous groups taught by guest Native elders and dancers. If there is sufficient interest, a dance group will be assembled using class members for spring presentations primarily in the Fairbanks area, including the Festival of Native Arts. Graded Pass/Fail. (0+2)

ANS F161 **Introduction to Alaska Native Performance** (h)
3 Credits Offered Fall
For Native and non-Native students with no prior acting or theatre experience. Includes both academic and practical components to examine traditional Alaska Native theatre mythology, ritual, ceremony and performance methods. Application of exercises and developmental scenes drawn from Alaska Native heritage. Cross-listed with THR F161. (3+0)

ANS F202X **Aesthetic Appreciation of Alaska Native Performance** (h)
3 Credits Offered Fall
Understanding and application of the cultural principles of Alaska Native oral narrative performances. Topics are arranged by the five broad Alaska Native regions and include lectures on culture, principles of visual arts analysis of oral narratives, musical expression and hands-on involvement in Alaska Native theatrical arts. ***Prerequisites: Placement in ENGL F111X or higher or permission of instructor.*** (3+0)

ANS F223 **Alaska Native Music** (h)
3 Credits Offered as Demand Warrants
Eskimo and Indian dance and song styles in Alaska. Emphasis on the sound, effect and purpose unique to each and the collection methods, analysis and the development of a broad musical perspective. Cross-listed with MUS F223. (3+0)

ANS F242 **Native Cultures of Alaska** (s)
3 Credits
The traditional Aleut, Eskimo and Indian (Athabascan and Tlingit) cultures of Alaska. Eskimo and Indian cultures in Canada. Linguistic and cultural groupings, population changes, subsistence patterns, social organization and religion in terms of local ecology. Pre-contact interaction between groups. Also available through the Center for Distance Education. Cross-listed with ANTH F242. (3+0)

ANS F250 **Current Alaska Native Leadership Perspectives** (s)
3 Credits Offered as Demand Warrants
Prominent leaders in the Native community are brought into direct classroom contact with students to discuss important issues in rural Alaska and the larger Native community. (3+0)

ANS F251 **Practicum in Native Cultural Expression**
1-3 Credits
Provides individual supervised activities in the formal organization, promotion and expression of Alaskan Native cultural heritage. May be repeated to a maximum of three credits. Graded Pass/Fail. ***Prerequisites: Permission of the department head.*** (1-3+0)

ANS F268 **Beginning Native Art Studio** (h)
3 Credits
Understanding and applying traditional designs and technologies of Native art. Special fees apply. ***Prerequisites: ART F105 or permission of instructor.*** Cross-listed with ART F268. (1+4)

ANS F275 **Yup'ik Practices in Spirituality and Philosophy** (h)
3 Credits Offered as Demand Warrants
Exploration of the processes in Yup'ik natural religion and the underlying philosophy that is the basis for Yup'ik existence in the spiritual realm. Wholeness of Yup'ik existence as it integrates into Western religion and philosophy. (3+0)

ANS F300 W **Alaska Native Writers Workshop** (h)
3 Credits Offered as Demand Warrants
Rhetorical methods of creative expression of the Alaska Native experience. Emphasis on the student's development of expressive abilities in a variety of Native and Western forms. Publication of student work a possibility. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; and permission of instructor.*** (3+0)

ANS F310 **The Alaska Native Lands Settlement** (s)
3 Credits Offered as Demand Warrants
Native corporation goals and methods as they implement the Alaska Native Claims Settlement Act and establish themselves within the larger political economy. Also available through the Center for Distance Education. ***Prerequisites: ANTH F242 or PS F263 or HIST F110; ECON F101; ECON F137; or permission of instructor.*** (3+0)

ANS F315 **Tribal People and Development** (s)
3 Credits Offered Spring Even-numbered Years
Impact of socioeconomic development processes on tribal peoples in less developed world societies. Implications of these processes for Alaska Native people. ***Prerequisites: Junior standing or permission of instructor.*** Cross-listed with RD F315. (3+0)

ANS F320 W **Language and Culture: Applications to Alaska** (s)
3 Credits Offered Spring
Language, ethnicity and their interrelationships. Communicating ethnic identity. Patterns of language use which affect communication between ethnic groups. Applicability of these concepts to Native/non-Native communication patterns. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; LING F101.*** Cross-listed with ANTH F320. (3+0)

ANS F325 **Native Self Government** (s)
3 Credits Offered as Demand Warrants
Indigenous political systems, customary law and justice in Alaska emphasizing the organization of Native governance under federal Indian law and Alaska state-chartered local government. Comparisons between Alaska Native political development and those of tribes in the contiguous 48 states and northern hemisphere tribal people. ***Prerequisites: HIST F110; PS F263; or permission of instructor.*** Cross-listed with PS F325. (3+0)

ANS F330 **Yup'ik Parenting and Child Development** (h)
1-3 Credits Offered as Demand Warrants
Processes, methods and evaluation of Yup'ik child rearing including how it is affected by other cultures and how these can be integrated into the process. Only offered at Kuskokwim Campus. ***Prerequisites: PSY F240 or permission of instructor.*** (1-3+0)

ANS F335 **Native North Americans** (s)
3 Credits Offered as Demand Warrants
Interdisciplinary examination of the ecological, cultural, historical and political experiences of Native Americans. Includes archaeological evidence, ethnographic data and indigenous accounts. Readings selected from all of North America with an emphasis on Alaska Natives. ***Prerequisites: ANS F101; ANS F242; or permission of instructor.*** (3+0)

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ANS F340 **Contemporary Native American Literature** (h)
3 Credits Offered Fall
Contemporary Native American writing in English, including novels, short stories, poetry and plays. Examples of Native American film when related to a written work. Works discussed in relation to cultural contexts and interpretations. ***Prerequisites: ENGL F111X or permission of instructor.*** Cross-listed with ENGL F340. (3+0)

ANS F347 **Voices of Native American Peoples** (h)
3 Credits Offered Spring Even-numbered Years
Exploration of the forms by which Native American peoples have narrated their life experiences. Includes oral narratives, written autobiographies, memoirs and speeches, and an introduction to the social, historical and cultural content surrounding these texts. Readings selected from all of North America with an emphasis on Alaska Natives. ***Prerequisites: ENGL F111X.*** Cross-listed with ENGL F347. (3+0)

ANS F348 W **Native North American Women** (s)
3 Credits Offered as Demand Warrants
Interdisciplinary examination of the relationship between Native American women and their social settings and cross-cultural experiences. Includes issues of political, economic and social solutions as employed by women in a large multi-ethnic nation-state. ***Prerequisites: ANS F101; ANTH F100X; ENGL F111X; ENGL F211X or ENGL F213X; SOC F100X; or permission of instructor.*** Cross-listed with WMS F348. (3+0)

ANS F349 **Narrative Art of Alaska Native Peoples (in English Translation)** (h)
3 Credits Offered Fall Even-numbered Years
Traditional and historical tales by Aleut, Eskimo, Athabascan, Eyak, Tlingit, Haida and Tsimshian storytellers. Bibliography, Alaska Native genres and viewpoints, and structural and thematic features of tales. ***Prerequisites: ENGL F111X or permission of instructor.*** Cross-listed with ENGL F349. (3+0)

ANS F350 W,O **Cross Cultural Communication: Alaskan Perspectives** (s)
3 Credits Offered Fall
Culture influences on communication patterns. Examines how misunderstandings may develop from differently organized ways of speaking and thinking when cultures come in contact. Focus on Alaska, with its diversity of cultures and languages, as a microcosm for examining these issues, particularly as they affect Native and non-Native communication in institutional settings. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** (3+0)

ANS F351 **Practicum in Native Cultural Expression**
1-3 Credits
Individual supervised activities in advanced organization, promotion and expression of Alaskan Native cultural heritage projects (Festival of Native Arts leadership, Tuma Theatre, Theata magazine, etc.). Continuation of ANS F251. Graded Pass/Fail. ***Prerequisites: Permission of instructor.*** (1-3+0)

ANS F360 **Advanced Native Dance** (h)
1 Credit Offered Spring
Advanced dance techniques with emphasis on the cultural meanings of the performance. Graded Pass/Fail. ***Prerequisites: ANS F160 or permission of instructor.*** (1+0+1)

ANS F361 **Advanced Alaska Native Performance** (h)
3 Credits Offered as Demand Warrants
In-depth study of Alaska Native theatre techniques and tradition, including traditional dance, song and drumming techniques, mask characterizations and performance application and presentation of a workshop production developed by the students during the semester. ***Prerequisites: ANS/THR F161.*** Cross-listed with THR F361. (2+3)

ANS F365 **Native Art of Alaska** (h)
3 Credits Offered Fall
Art forms of the Eskimo, Indian and Aleut from prehistory to the present. Changes in forms through the centuries. ***Prerequisites: Advanced standing or permission of instructor.*** Cross-listed with ANTH F365; ART F365. (3+0)

ANS F366 **Northwest Coast Indian Art** (h)
3 Credits Offered as Demand Warrants
Arts of the Northwest Coast Indians and the place of art in their culture. Cross-listed with ANTH F366; ART F366. (3+0)

ANS F367 **Eskimo Art** (h)
3 Credits Offered Spring Even-numbered Years
Eskimo art from Alaska, Canada and Siberia beginning with the earliest known pieces to the beginning of the 20th century. Cross-listed with ANTH F367; ART F367. (3+0)

ANS F368 **Intermediate Native Art Studio** (h)
3 Credits
Understanding and applying advanced traditional designs and technologies of Native art. Special fees apply. ***Prerequisites: ART F268 or permission of instructor.*** Cross-listed with ART F368. (1+4)

ANS F370 **Issues in Alaska Bilingual and Multicultural Education**
1 Credit Offered as Demand Warrants
Current issues related to Alaska bilingual and multicultural education. Students must attend all three days of the annual Alaska Bilingual/Multicultural Education and Equity Conference and write a paper reflecting on how they will use information gained from the conference in their own multicultural education context. Course may be repeated for credit since the content of the conference changes each year. Graded Pass/Fail. ***Prerequisites: Prior course work at the lower-division level.*** Cross-listed with ED F370. (1+0)

ANS F375 **Native American Religion and Philosophy** (h)
3 Credits Offered Spring Even-numbered Years
Philosophical aspects of Native American world views. Systems of belief and knowledge, explanations of natural phenomena, relationship of humans to natural environment through ritual and ceremonial observances. ***Recommended: PHIL F102.*** (3+0)

ANS F381 W **Alaska Natives in Film** (h)
3 Credits Offered Spring Odd-numbered Years
Analysis of the portrayal of Alaska's Inupiaq and Yup'ik peoples (with some on Canada's Inuit) through select films and readings. Learning to critically analyze films and understanding how various film techniques are accomplished while focusing on feature films' treatment and use of Northern peoples in film, as well as looking at the social impact of such films. Also available through the Center for Distance Education. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor. Recommended: ART/MUS/THR F200X.*** Cross-listed with FLM F381. (1.5+2-4)

ANS F401 **Cultural Knowledge of Native Elders** (h)
3 Credits Offered Fall
Study with prominent Native tradition-bearers in Native philosophies, values and oral traditions. Traditional knowledge elicited through the cultural heritage documentation process. Analysis of existing interactions between cultural traditions and contemporary American life as experienced by Native elders. ***Prerequisites: HIST F110; ANTH F242; upper-division standing.*** Cross-listed with RD F401. (3+0)

ANS F420 **Alaska Native Education** (s)
3 Credits Offered Fall
School systems historically serving Native people, current efforts toward local control and the cross-cultural nature of this education. Field experience required. ***Prerequisites: ANTH F242 or permission of instructor.*** Stacked with ED F606. Cross-listed with ED F420. (3+0)

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ANS F425 **Federal Indian Law and Alaska Natives** (s)
3 Credits Offered Fall Even-numbered Years
The special relationship between the federal government and Native Americans based on land transactions and recognition of tribal sovereignty. Federal Indian law and policy evolving from this relationship. Legal rights and status of Alaska Natives. ***Prerequisites: PS F101; HIST F110; or permission of instructor. Recommended: PS F263.*** Cross-listed with PS F425. (3+0)

ANS F450 **Comparative Indigenous Rights and Policies** (s)
3 Credits Offered as Demand Warrants
A case-study approach in assessing aboriginal rights and policies in different nation-state systems. Seven aboriginal situations examined for factors promoting or limiting self-determination. ***Prerequisites: Upper-division standing or permission of instructor.*** Cross-listed with PS F450. (3+0)

ANS F461 **Native Ways of Knowing** (h)
3 Credits Offered Spring
Focus on how culture and worldview shape who we are and influence the way we come to know the world around us. Emphasis on Alaska Native knowledge systems and ways of knowing. ***Prerequisites: Upper-division standing.*** Cross-listed with ED F461. (3+0)

ANS F468 **Advanced Native Art Studio** (h)
3 Credits
Advanced traditional designs and technologies of Native art. Use of contemporary materials to interpret traditional forms. Special fees apply. ***Prerequisites: ART F368 or permission of instructor.*** Cross-listed with ART F468. (3+0)

ANS F472 W **Rural Alaska, Natives and the Press** (h)
3 Credits Offered as Demand Warrants
Analysis of the historical role rural Alaska and Alaska Natives have played in the statewide press, including Native and non-Native journalists/publishers and their impact on Alaska history and the public mind. Analysis of the rural press, portrayal of rural Alaska in the urban press and the role of cultural journalism. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (3+0)

ANS F475 **Alaska Native Social Change** (s)
3 Credits Offered as Demand Warrants
Tradition and change in Native social institutions in contemporary society. Methods of identifying and analyzing significant Native social change processes for public understanding. ***Prerequisites: ANTH F242 or permission of instructor.*** (3+0)

AMERICAN SIGN LANGUAGE

ASLG F101 **American Sign Language I** (h)
3 Credits Offered as Demand Warrants
Visual-gestural language used by most deaf Americans. Acquisition of receptive and expressive conversational skills. Cultural aspects of everyday life experiences of deaf people. (3+0)

ASLG F110 **American Sign Language Practice** (h)
1 Credit Offered as Demand Warrants
Skill development in use of American Sign Language. Conducted entirely in sign language with aspects of deaf culture included. All skill levels. May be repeated twice for credit. Graded Pass/Fail. (1+0)

ASLG F202 **American Sign Language II** (h)
3 Credits Offered as Demand Warrants
Expressive and receptive conversational skills. Understanding the culture that is an integral part of the language. Continuation of American Sign Language I. ***Prerequisites: ASLG F101 or permission of instructor.*** (3+0)

ASLG F203 **American Sign Language III** (h)
3 Credits Offered as Demand Warrants
Grammar, conceptual structure and lexical items of American Sign Language. Cultural awareness and expressive and receptive signing skills for communicating and understanding American Sign Language in diverse contexts. Continuation of ASLG F101 and ASLG F202. ***Prerequisites: ASLG F202 or permission of instructor.*** (3+0)

ASLG F204 **American Sign Language IV** (h)
3 Credits Offered as Demand Warrants
Spontaneous and interactive use of American Sign Language. Grammar, structure and lexical components. Cultural aspects supporting communication in American Sign Language at an advanced level. A continuation of ASLG F203. ***Prerequisites: ASLG F203 or permission of instructor.*** (3+0)

ASLG F205 **American Sign Language V** (h)
3 Credits Offered as Demand Warrants
Highly advanced analysis of American Sign Language, including classifiers, grammar and lexicon. Expanded receptive and expressive skill development based in extensive cultural knowledge of the Deaf community in America. ***Prerequisites: ASLG F204 or permission of instructor.*** (3+0)

ANTHROPOLOGY

ANTH F100X **Individual, Society and Culture** (s)
3 Credits
An examination of the complex social arrangements guiding individual behavior and common human concerns in contrasting cultural contexts. ***Prerequisites: Placement in ENGL F111X or higher or permission of instructor.*** (3+0)

ANTH F101 **Introduction to Anthropology** (s)
3 Credits Offered as Demand Warrants
Human societies and cultures based on the findings of the four subfields of the discipline: archaeological, biological, cultural and linguistic. Also available through the Center for Distance Education. (3+0)

ANTH F105 **Introduction to the History and Culture of the Seward Peninsula**
1 Credit Offered as Demand Warrants
Cultural history of the Seward Peninsula peoples for the last 10,000 years using physical anthropology, ethnography, ethnohistory, linguistics, archaeology, ecology and climatology. Eskimo and Euroamerican cultures which have existed in western Alaska. Cross-listed with HIST F105. (1+0)

ANTH F111 **Ancient Civilizations** (s)
3 Credits Offered Fall
Major civilizations of the Old and New World from a comparative, anthropological perspective. Antecedents and influences of these civilizations on their neighbors. Economics, science, religion and social organization of these civilizations. (3+0)

ANTH F211 **Fundamentals of Archaeology** (s)
3 Credits Offered Fall
Methods and techniques of archaeological field and laboratory research. (2+3)

ANTH F214 **World Prehistory** (s)
3 Credits Offered Spring Even-numbered Years
Explores the archaeological evidence from the Old and New Worlds for the development of human culture, from the very beginning of humankind to the rise of ancient urban societies. ***Prerequisites: ANTH F100X or ANTH F111 or ANTH F211 or permission of instructor.*** (3+0)

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ANTH F215 **Fundamentals of Social/Cultural Anthropology** (s)
3 Credits Offered Spring
Introduction to the basic concepts, subfields and techniques of social/cultural anthropology. Includes non-Western and Western ethnographic topics, and discussion of career options. Recommended: ANTH F211. (3+0)

ANTH F221 **Introduction to Biological Anthropology**
3 Credits Offered Fall
Survey of genetics, evolutionary mechanisms, adaptation, primate studies, the human fossil record and human variation. Provides a basic understanding of humans from a biological, evolutionary and temporal perspective. (3+0)

ANTH F230 **The Oral Tradition: Folklore and Oral History** (h)
3 Credits Offered as Demand Warrants
Study and collection of folklore and oral history. Importance of oral tradition in human communication and the advantages and disadvantages of recording and studying it. Sociocultural anthropology and anthropological linguistics in relation to oral traditions. Methods of folklorists, historians and academicians. Field project required. (3+0)

ANTH F242 **Native Cultures of Alaska** (s)
3 Credits
The traditional Aleut, Eskimo and Indian (Athabascan and Tlingit) cultures of Alaska. Eskimo and Indian cultures in Canada. Linguistic and cultural groupings, population changes, subsistence patterns, social organization and religion in terms of local ecology. Pre-contact interaction between groups. Also available through the Center for Distance Education. Cross-listed with ANS F242. (3+0)

ANTH F245 **Culture and Global Issues** (s)
3 Credits Offered as Demand Warrants
Introduces students to the anthropological study of globalization and global issues including the deterritorialization of culture, global social movements, culture and capital, immigration and culture, and modern and postmodern approaches to the study of culture and society. Begins with the history of global ethnography, but focuses primarily on contemporary issues. ***Prerequisites: ANTH F100X.*** (3+0)

ANTH F301 **World Ethnography** (s)
3 Credits Offered Spring Even-numbered Years
Survey of ethnographic research on peoples and cultures of selected geographic regions of the world, in both historical and contemporary perspective. Content of the course varies and is contingent on available faculty expertise. Course may be repeated once for credit when content varies. ***Prerequisites: ANTH F100X or permission of instructor.*** (3+0)

ANTH F302 **Ethnography of Siberia** (s)
3 Credits Offered as Demand Warrants
Survey of ethnographic research on peoples and cultures of Siberia, including the Russian Far East, in both historical and contemporary perspective. ***Prerequisites: ANTH F100X or permission of instructor.*** (3+0)

ANTH F308 W,O **Language and Gender** (s)
3 Credits Offered Fall Odd-numbered Years
Examination of relationships between language and gender, drawing on both ethnographic and linguistic sources. Topics include power, socialization and sexism. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** Cross-listed with LING F308; WMS F308. (3+0)

ANTH F309 **Circumpolar Archaeology** (s)
3 Credits Offered Fall Odd-numbered Years
Archaeology of the circumpolar world from initial occupations through the historic period. Cultural and chronological variability in human adaptation to high latitudes. Causes and consequences of population movement, environmental change and cultural interaction in the Old and New World, as understood through archaeology. ***Prerequisites: Permission of instructor.*** (3+0)

ANTH F313 **Ethnography of Alaska** (s)
3 Credits Offered Fall Odd-numbered Years
Survey of ethnographic research on peoples and cultures of Alaska, in both historical and contemporary perspective. Content of the course varies and may cover Aleuts and other peoples of the Alaskan Southwest; Inupiaq and Inuit peoples; peoples of the Alaskan Southeast; or Athabascan peoples. ***Prerequisites: ANTH F100X or permission of instructor.*** (3+0)

ANTH F315 **Human Biology** (n)
3 Credits Offered Spring Even-numbered Years
Biology of recent and modern human populations, including systematics, behavior, ecology and inter- and intrapopulation genetic and morphological variations. Human adaptations to heat, cold, high altitudes and changing nutritional and disease patterns. Human skeletal biology, including metrical and non-metrical variation, aging and sexing skeletal remains, and paleopathology. ***Prerequisites: ANTH F221 or BIOL F103X.*** (2+3)

ANTH F317 **Human Growth and Development**
3 Credits Offered as Demand Warrants
Life-span approach to physiological (and cognitive) growth and development in fossil through modern humans. Begins with a summary of human biology and genetics. Proceeds through major phases in life: prenatal, infancy, childhood, adolescence, adult and old age. Includes detailed soft and hard tissue developments in these phases of life. ***Prerequisites: ANTH F221.*** (3+0)

ANTH F320 W **Language and Culture: Applications to Alaska** (s)
3 Credits Offered Spring
Language, ethnicity and their interrelationships. Communicating ethnic identity. Patterns of language use which affect communication between ethnic groups. Applicability of these concepts to Native/non-Native communication patterns. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; LING F101; or permission of instructor.*** Cross-listed with ANS F320. (3+0)

ANTH F360 **Indigenous Art and Culture** (h)
3 Credits Offered as Demand Warrants
Overview of the aesthetic expressions of the cultures of Africa, Oceania and Native North America. Cultural and social factors will be studied through visual art from these areas. Cross-listed with ART F360. (3+0)

ANTH F365 **Native Art of Alaska** (h)
3 Credits Offered Fall
Art forms of the Eskimo, Indian and Aleut from prehistory to the present. Changes in forms through the centuries. ***Prerequisites: Advanced standing or permission of instructor.*** Cross-listed with ANS F365; ART F365. (3+0)

ANTH F366 **Northwest Coast Indian Art** (h)
3 Credits Offered as Demand Warrants
Arts of the Northwest Coast Indians and the place of art in their culture. Cross-listed with ANS F366; ART F366. (3+0)

ANTH F367 **Eskimo Art** (h)
3 Credits Offered Spring Even-numbered Years
Eskimo art from Alaska, Canada and Siberia beginning with the earliest known pieces to the beginning of the 20th century. Cross-listed with ANS F367; ART F367. (3+0)

ANTH F382 **The People of Alaskan Southeast** (s)
3 Credits
Tlingit, Haida and Tsimshian societies in the framework of Northwest Coast culture-area. Impact of Russian penetration and historical factors. ***Prerequisites: ANTH F242 or permission of instructor.*** (3+0)

ANTH F383 **Athabascan Peoples of Alaska and Adjacent Canada** (s)
3 Credits Offered Fall Even-numbered Years
Contemporary conditions and traditional heritage of the Athabascan populations of Alaska and Canada. Impact of Euroamericans on these populations and cultures. ***Prerequisites: ANTH F242 or permission of instructor.*** (3+0)

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ANTH F384 **History of Anthropology**
3 Credits Offered Fall
Major theoretical approaches in anthropology chronologically from formulation of the discipline of anthropology to current theory. Nature of the discipline, its goals and methods, and the relevance of theoretical perspectives to interpretations in anthropology. ***Prerequisites: ANTH F215 or permission of instructor.*** (3+0)

ANTH F402 **Anthropology of Art** (s)
3 Credits Offered as Demand Warrants
Anthropological study of art in cross-cultural perspective. Social context of art production and use and cross-cultural variations in definition of an artist's role. ***Prerequisites: Senior standing or permission of instructor.*** Cross-listed with ART F402. Stacked with ANTH F602. (3+0)

ANTH F403 W,O **Political Anthropology** (s)
3 Credits Offered Spring Odd-numbered Years
Political systems and the law. Case studies from nonindustrial societies, developing nations and parapolitical systems or encapsulated societies, such as Native peoples in the U.S. Political structures and institutions; social conflict, dispute settlement, social control and the law, political competition over critical resources; and ethnicity. ***Prerequisites: ANTH F215; COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** Stacked with ANTH F603. (3+0)

ANTH F405 W **Archaeological Method and Theory** (s)
3 Credits Offered Spring Even-numbered Years
Archaeological methods and analysis as the framework for different perspectives in archaeology. Application to specific research problems. ***Prerequisites: ANTH F211; ENGL F111X; ENGL F211X; or ENGL F213X.*** Stacked with ANTH F605. (3+0)

ANTH F407 **Kinship and Social Organization** (s)
3 Credits Offered Spring Even-numbered Years
Forms and function of family and household organization, kinship and marriage in diverse human sociocultural systems. Case studies from tribal and complex societies including contemporary United States. ***Prerequisites: ANTH F215 or permission of instructor.*** Stacked with ANTH F607. (3+0)

ANTH F409 **Anthropology of Religion** (s)
3 Credits Offered Fall Odd-numbered Years
Religion or supernatural belief from the perspective of anthropology. Religion in the context of "primitive" society as well as its role in complex society. Religious practitioners, ritual, belief systems and the relationship of religious behavior to other aspects of social behavior. ***Prerequisites: ANTH F100X; ANTH F215; or permission of instructor.*** Stacked with ANTH F609. (3+0)

ANTH F411 O **Senior Seminar in Anthropology** (s)
3 Credits Offered Spring
The integrated nature of anthropological inquiry. Includes a four-field approach to anthropology in a discussion-intensive setting. Student may focus on an interdisciplinary theme or a topic other than their own specialization. ***Prerequisites: COMM F131X or COMM F141X, Anthropology major with senior standing, or permission of instructor.*** (3+0)

ANTH F415 **Zooarchaeology and Taphonomy**
3 Credits Offered Fall Even-numbered Years
Identification of bones, how vertebrate bone remains may be used to study archaeological site formation processes, site organization, subsistence practices and animal procurement strategies. Preservation in modern depositional environments, paleoecology, vertebrate mortality profiles and demographic structure, site seasonality, bone breakage, taphonomy and faunal remains, and human land use practices. (2+3)

ANTH F422 **Human Osteology**
3 Credits
Human skeletal analysis: bone biology, skeletal anatomy, aging and sexing, metric and non-metric traits of skeleton and dentition, paleopathology and paleodemography. Inferences on genetic relationships between and patterned behavior within prehistoric groups derived from skeletal material. ***Prerequisites: ANTH F221 or permission of instructor.*** Stacked with ANTH F625. (0+0)

ANTH F423 **Paleoanthropology**
3 Credits Offered Spring Odd-numbered Years
Analysis of the Plio-Pleistocene hominid fossil record, including comparative primate and hominid skeletal and dental anatomy, systematics, taphonomy and long-term biobehavioral adaptations. ***Prerequisites: ANTH F212 or ANTH F221 or permission of instructor.*** Stacked with ANTH F623. (2+3)

ANTH F424 **Analytical Techniques**
3 Credits Offered Fall Even-numbered Years
Classification, sampling, collection and analysis of anthropological data: parametric and nonparametric significance tests and measures of association, analysis of frequency data, estimating resemblance using multiple variables, computer simulations and analysis. ***Prerequisites: ANTH F211 or ANTH F221; any college level mathematics course; or permission of instructor.*** Stacked with ANTH F624. (3+0)

ANTH F426 **Bioarchaeology**
3 Credits Offered Spring Even-numbered Years
Innovative methods for studying past interactions between biological and cultural factors, as revealed through human and faunal skeletal and plant remains. From these data sources, health, diet, social organization and interactions and life histories of past populations, as well as the environments in which they lived, are reconstructed and examined. ***Prerequisites: ANTH F211 or equivalent; ANTH F221.*** Stacked with ANTH F626. (3+0)

ANTH F428 **Ecological Anthropology and Regional Sustainability**
3 Credits Offered Spring Even-numbered Years
Biological, environmental and cultural factors and their interplay in defining the human condition, with examples from the Arctic and other populations. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; junior standing; or permission of instructor.*** (3+0)

ANTH F432 **Field Methods in Descriptive Linguistics** (h)
3 Credits Offered Spring Odd-numbered Years
Introduction to general issues in language field work and to issues specific to working with little studied and/or endangered languages in particular. Focus on introduction to writing systems, making recordings, computers and transcriptions, planning consultant sessions, working with consultants, interviewing and ethics in the field. Projects include making transcriptions of familiar language, and later, working on unfamiliar language with a language consultant, selecting and carrying out a well-defined project, resulting in a term paper. ***Prerequisites: LING F318; LING F320; or permission of instructor.*** Cross-listed with LING F431. Stacked with ANTH F632; LING F631. (3+0)

ANTH F434 **Field Methods in Descriptive Linguistics II**
3 Credits Offered Fall Odd-numbered Years
Second semester of Field Methods sequence. Plan a linguistic field project, including field trip, caring for equipment, data handling, community contacts, intellectual property and repatriation. Course work includes lectures and group elicitation with a speaker of a non-Indo-European language. Projects may involve either the traditional field work involving finding and working with a consultant, or work involving research in archival materials on languages no longer spoken. ***Prerequisites: LING F431 or ANTH F432.*** Cross-listed with LING F434. Stacked with LING F634; ANTH F634. (3+0)

ANTH F445 **Gender in Cross-Cultural Perspective** (s)
3 Credits Offered Spring Even-numbered Years
Gender as both cultural construction and social relationship is examined through readings in comparative ethnographies portraying gender roles in a broad variety of societies, from hunter-gatherer to industrial. New theoretical and methodological approaches in anthropology for exploring and understanding the experiences of women and men in their cultural variety are presented

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Prerequisites: ANTH F215 or WMS F201 or permission of instructor. Cross-listed with WMS F445. Stacked with ANTH F645. (3+0)

ANTH F446 **Economic Anthropology** (s)
3 Credits Offered Fall Even-numbered Years
Relationships between economic and other social relations. Pre-industrial societies. Relevance of formal economics to small-scale societies and developing nations. Exchange, formal and substantive economics, market economics, rationality, political economy and the economics of development. ***Prerequisites: A cultural anthropology class or permission of instructor.*** Stacked with ANTH F646. (3+0)

ANTH F451 **Quaternary Seminar**
3 Credits Offered as Demand Warrants
Discussion of the Quaternary Period (relatively recent past - spanning the past two million years) in order to gain a better understanding of the landscape, biota and climate of the present day. Quaternary studies are concerned with the historical dimension of the natural sciences. This seminar will range widely over diverse interdisciplinary subjects of Quaternary interest, such as paleoclimatology, paleobiogeography, vertebrate paleontology, and sedimentology. ***Prerequisites: GEOS F315; GEOS F304; GEOS F322.*** Cross-listed with GEOS F452. Stacked with ANTH F651; GEOS F651. (3+0)

ANTH F465 **Geoarchaeology**
3 Credits Offered as Demand Warrants
Geological context of archaeological sites and the geologic factors that affect their preservation, with emphasis on Alaska. Includes a one or two-day weekend field trip in late April or early May. Special fees apply. ***Prerequisites: GEOS F101X, an introductory course in archaeology, or permission of instructor.*** Cross-listed with GEOS F465. (3+0)

ANTH F470 **Oral Sources: Issues in Documentation** (h)
3 Credits Offered Fall
Preparation for recording and use of oral resources. Examines how meaning is conveyed through oral traditions and personal narratives and the issues involved with recording and reproducing narratives. Includes management of oral recordings, ethical and legal considerations, issues of interpretation and censorship, and the use of new technologies to access and deliver recordings. ***Prerequisites: At least one undergraduate ANTH course and one undergraduate HIST course, or permission of instructor.*** Cross-listed with NORS F470. Stacked with ANTH F670; NORS F670. (3+0)

ANTH F472 **Culture and History in the North Atlantic** (s)
3 Credits Offered Spring Odd-numbered Years
Ancient Norse culture and society. Includes readings of Old Norse poetry and Icelandic sagas in translation, with secondary analyses and archaeological background. Includes Greenlandic myths and contemporary ethnographic accounts of Iceland, Greenland and the Faroe Islands. ***Prerequisites: ANTH F100X. Recommended: ANTH F215.*** Stacked with ANTH F672; NORS F672. (3+0)

ANTH F602 **Anthropology of Art**
3 Credits Offered as Demand Warrants
Anthropological study of art in a cross-cultural perspective. Social context of art production and use, cross-cultural variations in definition of an artist's role. ***Prerequisites: Senior standing or permission of instructor.*** Stacked with ANTH F402; ART F402. (3+0)

ANTH F603 **Political Anthropology**
3 Credits Offered Spring Odd-numbered Years
Political systems and the law. Case studies from nonindustrial societies, developing nations and parapolitical systems or encapsulated societies, such as Native peoples in the U.S. Political structures and institutions; social conflict, dispute settlement, social control and the law, political competition over critical resources; and ethnicity. ***Prerequisites: Graduate standing.*** Stacked with ANTH F403. (3+0)

ANTH F605 **Archaeological Method and Theory**
3 Credits Offered Spring Even-numbered Years
Archaeological methods and analysis as the framework for different perspectives in archaeology. Application to specific research problems. ***Prerequisites: ANTH F211 or permission of instructor.*** Stacked with ANTH F405. (3+0)

ANTH F606 **Folklore and Mythology: Anthropological Perspective**
3 Credits Offered as Demand Warrants
Intensive introduction to anthropological theory concerning oral traditions and the verbal arts. Attention is paid to classic historical approaches, but discussion of contemporary focus on context and performance is highlighted. Students will research topics of individual interest. ***Prerequisites: Upper-division undergraduate anthropology course or permission of instructor.*** (3+0)

ANTH F607 **Kinship and Social Organization**
3 Credits Offered Spring Even-numbered Years
Forms and function of family and household organization, kinship and marriage in diverse human sociocultural systems. Case studies from tribal and complex societies including contemporary United States. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with ANTH F407. (3+0)

ANTH F609 **Anthropology of Religion**
3 Credits Offered Fall Odd-numbered Years
Religion or supernatural belief from the perspective of anthropology. Religion in the context of "primitive" society as well as its role in complex society. Religious practitioners, ritual, belief systems and the relationship of religious behavior to other aspects of social behavior. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with ANTH F409. (3+0)

ANTH F610 **Northern Indigenous Peoples and Contemporary Issues**
3 Credits Offered Fall Odd-numbered Years
This course examines a number of issues affecting northern indigenous peoples from a comparative perspective, including perspectives from Alaska, Canada, Greenland and the Soviet Union. Issues include the impact of the alienation of land on which these peoples depend; the relationship between their small, rural microeconomies and the larger agroindustrial market economies of which they are a part; education, language loss and cultural transmission; alternative governmental policies towards indigenous peoples; and contrasting world views. ***Prerequisites: Graduate standing or upper-division standing with permission of instructor.*** Cross-listed with NORS F610. (3+0)

ANTH F612 **Paleoecology**
3 Credits Offered as Demand Warrants
Advanced study of Quaternary environments. The influences of climatic change and the interrelationships of physical and biological factors on the distribution and evolution of biota, including humans, will be discussed. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ANTH F616 **Anthropologic Background for Resilience and Adaptation**
1 Credit Offered fall
Provides the anthropological background that is necessary for understanding the role of anthropology in complex systems involving interactions among biological, economic, and social processes. Designed for incoming students of the Resilience and Adaptation Program (RAP), who have not received training in anthropology. ***Prerequisites: Graduate student enrollment or permission of instructor.*** (1+0)

ANTH F617 **Resilience Internship**
2 Credits Offered Fall
Students of the Resilience and Adaptation Program participate in internships to broaden their interdisciplinary training, develop new research tools and build expertise outside their home disciplines. Internships are for eight to ten weeks of full time commitment and take place during the student's first summer in the program. In autumn students meet to discuss their internship experiences and make public presentations. ***Prerequisites: ANTH/BIOL/ECON/NRM F667;***

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ANTH/BIOL/ECON/NRM F668; or permission of instructor. Cross-listed with BIOL F613; ECON F613; NRM F613. (2+0)

ANTH F618 Historical Archaeology
3 Credits Offered as Demand Warrants
Historical archaeology of the Americas examines colonial and frontier archaeology as experienced by Euroamericans, in addition to contact and post contact archaeology of Native North Americans. Current perspectives in American historical archaeology, including a review of goals, problem orientation and the manner in which archaeological and documentary data are used for anthropological interpretation. ***Prerequisites: ANTH F405 or ANTH F605 or permission of instructor.*** (3+0)

ANTH F623 Paleoanthropology
3 Credits Offered Spring Odd-numbered Years
Analysis of the Plio-Pleistocene hominid fossil record, including comparative primate and hominid skeletal and dental anatomy, systematics, taphonomy and long-term biobehavioral adaptations. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with ANTH F423. (2+3)

ANTH F624 Analytical Techniques
3 Credits Offered Fall Even-numbered Years
Classification, sampling, collection and analysis of anthropological data: parametric and nonparametric significance tests and measures of association, analysis of frequency data, estimating resemblance using multiple variables, computer simulations and analysis. ***Prerequisites: Graduate standing in Anthropology.*** Stacked with ANTH F424. (3+0)

ANTH F625 Human Osteology
3 Credits Offered Fall Odd-numbered Years
Human skeletal analysis: bone biology, skeletal anatomy, aging and sexing, metric and non-metric traits of skeleton and dentition, paleopathology, and paleodemography. Inferences on genetic relationships between and patterned behavior within prehistoric groups derived from skeletal material. ***Prerequisites: ANTH F315; graduate standing; or permission of instructor.*** Stacked with ANTH F422. (3+0)

ANTH F626 Bioarchaeology
3 Credits Offered Spring Even-numbered Years
Innovative methods for studying past interactions between biological and cultural factors as revealed through human and faunal skeletal and plant remains. From these data sources, health, diet, social organization and interactions and life histories of past populations, as well as the environments in which they lived, are reconstructed and examined. ***Prerequisites: Graduate standing; or permission of instructor. Recommended: ANTH F415; ANTH F625.*** Stacked with ANTH F426. (3+0)

ANTH F629 Structures of Anthropological Argument
3 Credits Offered Fall
Reading and analysis of examples from various paradigms in anthropology, past and present. Presents a thorough grounding in forms of anthropological argument and preparation for the research and writing process. Includes evolutionary, Boasian, structural-functional, structural as well as subdisciplinary linguistic, archaeological and biological forms of argument. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ANTH F630 Anthropological Field Methods
3 Credits Offered Spring Odd-numbered Years
Concentration on the practical concerns and aspects of conducting anthropological field research. Includes the relevant literature and significant discussions on the different aspects of fieldwork. In addition, students will gain practical experience in the problems, techniques and methods of fieldwork involving people from similar or distinct cultural backgrounds. The preparation of research proposals is also given attention. ***Prerequisites: Graduate standing in Anthropology or permission of instructor.*** (3+0)

ANTH F631 Language and Culture Seminar
3 Credits Offered Spring Even-numbered Years
In-depth examination of the interrelation between language and culture in the context of the theories of human communication, semiotics and maintenance of cultural boundaries. In particular, the influence of the Sapir-Whorf hypothesis in anthropological thinking today and the field of ethnoscience will be examined, as well as language change in contact situations with emphasis on emergence of pidgin and Creole languages and effects of the introduction of writing. ***Prerequisites: Graduate standing; previous credit in anthropological or descriptive linguistics; or permission of instructor.*** (3+0)

ANTH F632 Field Methods in Descriptive Linguistics
3 Credits Offered Spring Odd-numbered Years
Introduction to general issues in language field work and to issues specific to working with little studied and/or endangered languages in particular. Focus on introduction to writing systems, making recordings, computers and transcriptions, planning consultant sessions, working with consultants, interviewing, and ethics in the field. Projects include making transcriptions of familiar language, and later, working on unfamiliar language with a language consultant, selecting and carrying out a well-defined project, resulting in a term paper. ***Prerequisites: LING F318; LING F320; or permission of instructor.*** Cross-listed with LING F631. Stacked with ANTH F432; LING F431. (3+0)

ANTH F634 Field Methods in Descriptive Linguistics II
3 Credits Offered Fall Odd-numbered Years
Second semester of Field Methods sequence. Plan linguistic field project, including field trip, caring for equipment, data handling, community contacts, intellectual property and repatriation. Course work includes lectures and group elicitation with a speaker of non-Indo-European language. Projects may involve either the traditional field work involving finding and working with a consultant, or work involving research of archival materials on languages no longer spoken. ***Prerequisites: ANTH F632 or LING F631.*** Cross-listed with LING F634. Stacked with ANTH F434; LING F434. (3+0)

ANTH F637 Methods in Ethnohistorical Research
3 Credits Offered Spring Even-numbered Years
Students of anthropology are introduced to the methods of historical research, particularly the critical evaluation of written documents, problems of archaic language and paleography, and methods for assessing art and folklorist tradition as sources of history. Oral history and the data of language and archaeology are considered. ***Prerequisites: Graduate standing in anthropology or permission of instructor.*** (3+0)

ANTH F645 Gender in Cross-Cultural Perspective
3 Credits Offered Spring Even-numbered Years
Gender as both cultural construction and social ethnographies relationship is examined through readings in comparative ethnographies portraying gender roles in a broad variety of societies, from hunter-gatherer to industrial. New theoretical and methodological approaches in anthropology for exploring and understanding women's and men's experiences in their cultural variety are presented. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with ANTH F445; WMS F445. (3+0)

ANTH F646 Economic Anthropology
3 Credits Offered Fall Even-numbered Years
Relationships between economic and other social relations. Pre-industrial societies. Relevance of formal economics to small-scale societies and developing nations. Exchange, formal and substantive economics, market economics, rationality, political economy and the economics of development. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with ANTH F446. (3+0)

ANTH F647 Global to Local Sustainability
3 Credits Offered Fall
Explores the basic principles that govern resilience and change of ecological and social systems. Principles are applied across a range of scales from local communities to the globe. Working within and across each of these scales, students address the processes that influence ecological, cultural and economic

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sustainability, with an emphasis on northern examples. ***Prerequisites: Graduate standing and permission of instructor.*** Cross-listed with BIOL F647; ECON F647; NRM F647. (3+0)

ANTH F649 **Integrated Assessment and Adaptive Management**
3 Credits Offered Spring
An interdisciplinary exploration of the theoretical and practical considerations of integrated assessment and adaptive management. Students survey concepts important in understanding societal and professional-level decision-making. Students work as individuals and as a team to undertake case studies with relevance to integrated assessment and adaptive management. Collectively, the class builds a portfolio of cases and conducts an integrated assessment. Note: In case of enrollment limit, priority will be given to graduate students in the Resilience and Adaptation Program in order for them to be able to meet their core requirements. ***Prerequisites: Graduate student standing in a natural science, social science, or interdisciplinary program at UAF or another university or permission of instructor. The course is designed to fit into the sequence of Resilience and Adaptation Program's core courses. It is open to other graduate students interested in and prepared to conduct interdisciplinary studies relating to sustainability. Recommended: ANTH/BIOL/ECON/NRM F647; ANTH/BIOL/ECON/NRM F648; ANTH/BIOL/ECON/NRM F667.*** Cross-listed with BIOL F649; ECON F649; NRM F649. (3+0)

ANTH F652 **Research Design and Professional Development Seminar**
3 Credits Offered Spring
How to develop problem-based research in anthropology and prepare research proposals, grant proposals and publications along with critical evaluations of similar material. Topics include preparation of oral presentations for professional meetings, lectures and seminars; curriculum vitae preparation; and project budgeting. ***Prerequisites: Upper-division anthropology course or permission of instructor.*** (3+0)

ANTH F653 **Current Perspectives in Cultural Resource Management**
3 Credits Offered Fall Odd-numbered Years
Cultural resource management. Includes historic preservation and environmental law. Reviews pertinent legislation pertaining to the protection of historic properties and presents a series of real world problems confronted by archaeologists. Cultural resource management will be treated historically within a context of the development of American archaeology. Emphasis on practical aspects of career development. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ANTH F667 **Resilience Seminar I**
1 Credit Offered Fall
Provides a forum for new students of the Resilience and Adaptation graduate program to explore issues of interdisciplinary research that are relevant to sustainability. A considerable portion of the seminar is student-directed, with students assuming leadership in planning seminar activities with the instructor. Graded Pass/Fail. ***Prerequisites: Enrolled in Resilience and Adaptation Graduate Program or permission of instructor. Recommended: ANTH/BIOL/ECON/NRM F647.*** Cross-listed with BIOL F667; ECON F667; NRM F667. (2+0)

ANTH F668 **Resilience Seminar II**
1 Credit Offered Spring
Provides a forum for new students of the Resilience and Adaptation graduate program to explore issues of interdisciplinary research relevant to sustainability. The seminar provides support to each student planning his/her summer internship and preparing and presenting a thesis research prospectus. Graded Pass/Fail. ***Prerequisites: ANTH/BIOL/ECON/NRM F647; ANTH/BIOL/ECON/NRM F667; or permission of instructor.*** Cross-listed with BIOL F668; ECON F668; NRM F668. (2+0)

ANTH F670 **Oral Sources: Issues in Documentation**
3 Credits Offered Fall
Preparation for recording and use of oral resources. Examines how meaning is conveyed through oral traditions and personal narratives and the issues involved with recording and reproducing narratives. Includes management of oral recordings, ethical and legal considerations, issues of interpretation and censorship and the use of new technologies to access and deliver recordings. ***Prerequisites: At least one undergraduate ANTH course and one undergraduate HIST course, or permission of instructor.*** Cross-listed with NORS F670. Stacked with ANTH F470; NORS F470. (3+0)

ANTH F672 **Culture and History in the North Atlantic**
3 Credits Offered Spring Odd-numbered Years
Study of ancient Norse culture and society. Includes readings of Old Norse poetry and Icelandic sagas in translation, with secondary analyses and archaeological background. Includes Greenlandic myths and contemporary ethnographic accounts of Iceland, Greenland and the Faroe Islands. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with NORS F672. Stacked with ANTH F472. (3+0)

ANTH F675 **Political Ecology of the Oceans**
3 Credits Offered Alternate Spring
Introduction to the field of political ecology in the marine sphere. Topics include the sociology of scientific knowledge, traditional and local ecological knowledge, politics of resource management, processes of marine enclosure, environmental values, marine conservation, environmental justice, and colonialism and economic development. ***Prerequisites: Graduate standing; or permission of instructor.*** Cross-listed with FISH F675. (3+0)

APPLIED ART

APAR F100 **Basic Video Workshop**
1 Credit Offered as Demand Warrants
Basic video equipment operation and elementary equipment maintenance. Camera techniques, portable video recorders, lighting, audio and simple video production. (1+0)

APAR F103 **Editing Videotape**
1 Credit Offered as Demand Warrants
Principles and operations in electronic editing of videotape. Persons completing this course may use Media Center videotape editing facilities. (1+1)

APAR F105 **Community TV Production**
1 Credit Offered as Demand Warrants
Video production for the Nome Public Access Cable Television (NPACT) channel in a ten-week "hands-on" training lab using a variety of video equipment. Each student will produce at least one 30-minute production. Offered at Northwest Campus. (1+1)

APAR F107 **Beading**
1 Credit Offered as Demand Warrants
Application of beads to various materials, three kinds of stitches and use of a bead loom. (1+1)

APAR F140 **Clothing Construction**
1 Credit Offered as Demand Warrants
Techniques of clothing construction for the home sewer. Development of sewing skills necessary to create garments for the beginner as well as the more experienced sewer. (1+0)

APAR F150 **Introduction to Traditional Crafts**
1-3 Credits Offered as Demand Warrants
Introduction to traditional crafts such as basket weaving, birch bark basket-making, beading, carving, canoe or kayak making, etc. Topics vary based on community need and interest and will be identified each semester. Course may be repeated for credit with each new topic. (1-3+0)

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APAR F157 **Skin Sewing**
1-2 Credits Offered as Demand Warrants
Fundamentals of skin sewing. Projects (e.g. slippers, mukluks, mittens, fur hats, vests and ruffs) dependent upon student ability and experience. (1-2+0)

APAR F250 **Intermediate Traditional Crafts**
1-3 Credits Offered as Demand Warrants
Continued development of traditional crafts such as basket weaving, birch bark basket-making, beading, carving, canoe or kayak making, etc. Topics vary based on community need and interest and will be identified each semester. Course may be repeated for credit with each new topic. ***Prerequisites: APAR F150 or permission of instructor.*** (1-3+0)

APPLIED BUSINESS

ABUS F051 **Bookkeeping For Business**
3 Credits Offered as Demand Warrants
Basic concepts and procedures of practical bookkeeping. Recording and reporting financial data for service and merchandising business. Covers businesses owned by one individual only (sole proprietorships.) Special fees apply. (3+0)

ABUS F070 **Job Readiness Skills**
1 Credit
Pre-employment and human relation skills necessary for job success, including how to identify career choices and employment opportunities; how to prepare a resume, job applications, cover and follow-up letters; and how to develop human relation skills. The student will select, prepare and be interviewed for jobs which match his/her skills identified through a self-assessment inventory. Offered at Northwest Campus. Also offered pass/fail as ABUS F070P. Special fees apply. (1+0)

ABUS F101 **Principles of Accounting I**
3 Credits
Accounting concepts and procedures for service businesses and for merchandising businesses owned by a single proprietor. A preparer's approach emphasizes the use of debits and credits to account for the details of business transactions. Also available through the Center for Distance Education. (3+0)

ABUS F102A **Keyboarding: Touch Typing**
1-3 Credits
Instruction in the mastery of alphabetic keyboard touch typing, skill building and document formatting. Skills mastered can be applied to typewriters, CRTs, computer terminals, or other equipment with a keyboard. May be repeated twice for credit. Graded Pass/Fail. (1-3+0)

ABUS F102B **Keyboarding: Skill Building**
1-3 Credits
Instruction in the mastery of alphabetic keyboard touch typing, skill building and document formatting. Skills mastered can be applied to typewriters, CRTs, computer terminals, or other equipment with a keyboard. May be repeated twice for credit. Graded Pass/Fail. (1-3+0)

ABUS F102C **Keyboarding: Document Formatting**
1-3 Credits
Instruction in the mastery of alphabetic keyboard touch typing, skill building and document formatting. Skills mastered can be applied to typewriters, CRTs, computer terminals, or other equipment with a keyboard. May be repeated twice for credit. Graded Pass/Fail. (1-3+0)

ABUS F108 **Keyboarding II/Intermediate Typewriting**
3 Credits Offered as Demand Warrants
Instruction and training to attain at least minimal typing skill, experience and knowledge necessary for a typist beginning an office career. Lab arranged. ***Prerequisites: CIOS F106 or one year high school typing or permission of instructor.*** (3+0)

ABUS F116 **Using 10-Key Calculators**
1 Credit Offered as Demand Warrants
Using the efficient 10-key touch method to solve business problems on a calculator. Emphasis is placed on developing occupational proficiency in the use of calculating machines for initial job placement. (1+0)

ABUS F120 **Personal Finance and Investing**
1-3 Credits Offered as Demand Warrants
Personal financial planning, goal setting and investing. Stocks, bonds, trusts, securities, options, real estate and other investment vehicles. Inflation, taxes, interest rates, retirement and selecting financial planners. Also available through the Center for Distance Education. (1-3+0)

ABUS F130 **Real Estate**
3 Credits Offered as Demand Warrants
Broad social and economic impact of real estate. Buying, selling, leasing and investing in residential and investment real estate. Contracts, deeds, mortgages, leases, title insurance, sales, brokerage and other related subjects. Fundamental preparation for the Real Estate licensing examination. (3+0)

ABUS F134 **Alphabetic Filing**
1 Credit
Mastery and use of ARMA filing rules as they apply to alphabetic, subject, numeric and geographic filing. (0+3)

ABUS F135 **Record Keeping for Business**
3 Credits Offered as Demand Warrants
Skills in keeping business records and banking procedures as a cashier, sales clerk, purchasing agent or payroll clerk. (3+0)

ABUS F141 **Payroll Accounting**
1-3 Credits Offered Fall
Payroll records and laws. Methods to compile and calculate payroll information, earnings, deductions and net wages. City, state and federal tax report forms. For payroll personnel. (1-3+0)

ABUS F142 **Office Accounting I**
1-3 Credits Offered Fall
Basic accounting procedures in retail, service and trade businesses. The complete accounting cycle, including record keeping, posting and preparation of financial statements, bank reconciliation, payroll computations and closing books. Accounts receivable, accounts payable, purchasing, credit and other accounting requirements. ***Recommended: ABUS F101; ABUS F141; concurrent enrollment or completion of ABUS F201; ABUS F220.*** (1-3+0)

ABUS F143 **Office Accounting II**
2 Credits Offered as Demand Warrants
Financial activities of partnerships and corporations with emphasis on accrual basis of accounting. Notes payable, notes receivable, interest transactions, bad debts, partnership equity accounting, corporate stock transactions, corporate earnings, capital transactions, bonds, long term liabilities and investments. (2+0)

ABUS F151 **Village Based Entrepreneurship**
1-3 Credits Offered as Demand Warrants
Technical and personal requirements for establishing and maintaining a small business in a rural village; advantages and disadvantages of operating a small business in a rural village. May be offered in three, 1 credit modules (a, b and c). (1-3+0)

ABUS F154 **Human Relations**
3 Credits
Attitudes, self-concepts, personal communication styles, motivation, interactions, positive reinforcements, team building and leadership development. (3+0)

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ABUS F155 Business Math
1-3 Credits
Review of basic math computation skills applied to various business areas. Emphasis on applications. (1-3+0)

ABUS F158 Introduction to Tourism
1-3 Credits Offered as Demand Warrants
Forces which influence international and domestic hospitality, leisure, travel and recreation industries. Socioeconomic models and measure of regional impact, demand and supply. (1-3+0)

ABUS F160 Principles of Banking
3 Credits Offered as Demand Warrants
Banking in today's economy. Language and documents of banking, check processing, teller functions, deposits, credit and payment functions, loans, investments, trust, the Federal Reserve System and other regulatory agencies. (3+0)

ABUS F161 Personal and Business Finance
3 Credits
Explores the management of personal and family finances, including financial planning, budgeting, time value of money, consumer buying, personal credit, savings and investment, home ownership and mortgages, insurance, estate planning, retirement, consumer fraud, and laws. (3+0)

ABUS F170 Business English
3 Credits Offered as Demand Warrants
Comprehensive review of grammar, punctuation, capitalization and spelling, with emphasis on business and office occupations. ***Recommended: DEVE F070; DEVS F104; placement into ENGL F111X; or departmental/instructor permission.*** (3+0)

ABUS F175 Customer Service
3 Credits Offered Fall
Presents customer service as integral to business success. Preparation for effective interaction with customers. Includes trends, interpretation of trends and development of fundamental skills necessary to achieve excellence. ***Recommended: BA F151; ABUS F154.*** (3+0)

ABUS F178 Business and Professional Presentations
3 Credits Offered Spring
Organizing a message, document design, visual presentations, analyzing audiences, communicating the message and presenting financial information. (3+0)

ABUS F179 Fundamentals of Supervision
3 Credits Offered Spring
Effective supervisory concepts including planning, organizing and staffing functions. Communicating and delegating effectively, morale, productivity, decision making, positive position discipline and performance goals development. (3+0)

ABUS F182 Office Procedures
3 Credits Offered as Demand Warrants
Duties and responsibilities of general office employees including filing, processing mail, telephone communication, meeting the public, office supplies, banking, employment procedures and grooming. (3+0)

ABUS F183 Advanced Job Readiness Skills
1-3 Credits Offered as Demand Warrants
Practical information necessary to help students choose meaningful employment as well as build their own employment portfolio. Materials used will allow students to learn more about themselves, engage in personal assessment and learn how this information relates to different careers. Students will complete target resumes, cover letters, follow-up letters, applications, job search strategies, mock job interviews and a professional portfolio. ***Recommended: Job readiness. This class is designed for students embarking into the job market.*** (1-3+0)

ABUS F188 Personal Income Tax
1 Credit Offered Fall
Taxable income, deductions, credit, exemptions, and computation. Computer use, record keeping methods, tax forms and new tax laws. (1+0)

ABUS F199 Practicum in Applied Business
1-3 Credits
Supervised training and work experience. Analysis of work experience and relationship of the job to career and academic goals. Managerial concepts, problems of working with groups and individuals, organizational structures, communications and planning. ***Prerequisites: Permission of instructor.*** (0+0)

ABUS F201 Principles of Accounting II
3 Credits
Introduction to accounting concepts and procedures for a business. Emphasis is on the accounting cycle and the recording, summarizing and interpretation of accounting data. ***Recommended: Math placement at F100-level or above.*** (3+0)

ABUS F202 Principles of Accounting III
3 Credits Offered Spring
Continuation of elementary accounting concepts and procedures with the introduction of cost accounting principles for manufacturing and service operations. Job order costing, process costing, cost-volume profit, budgeting and variances are introduced. ***Prerequisites: ABUS F201 or permission of instructor. Recommended: Math placement at F100-level or above.*** (3+0)

ABUS F207 Machine Transcription
2 Credits Offered as Demand Warrants
Training in machine transcription with emphasis on mailable copies. Review of language skills and vocabulary included. ***Prerequisites: CIOS F108 or permission of instructor.*** (2+0)

ABUS F208 Medical Machine Transcription
2 Credits Offered as Demand Warrants
Instruction and practice in formatting medical papers including Medicare and admission forms, a dental report, preparing patient histories, medical reports, file cards and other medical documents. Practice in transcribing from machine dictation and in using medical terminology correctly. ***Prerequisites: ABUS F108; ABUS F207.*** (2+0)

ABUS F209 Legal Machine Transcription
2 Credits Offered as Demand Warrants
Instruction and practice in formatting legal papers including a lease, bill of sale, subpoena, stipulations, interrogatories, notices and various types of orders. Transcription from machine dictation; using the language of the law correctly. (2+0)

ABUS F210 Income Tax
3 Credits
Income tax fundamentals. Includes how to complete basic income tax forms/schedules for individuals and small business owners. Covers taxable income, deductions, credits, exemptions, computation, record keeping methods, new tax laws and strategies to reduce taxes. (3+0)

ABUS F220 Microcomputer Accounting: QuickBooks
3 Credits
Basic microcomputer principles. Includes entering transactions, analyzing results, correcting errors and organizing business finances. QuickBooks is a widely used accounting software application. Also available through the Center for Distance Education. ***Prerequisites: ABUS F101 or permission of instructor.*** (3+0)

ABUS F221 Microcomputer Accounting
3 Credits
Computer processing of accounting transactions. Software packages, microcomputer systems and hardware, computer terminology, system analysis and

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actual computer operations in accounting. ***Prerequisites: ACCT F261; ABUS F142.*** (3+0)

ABUS F223 Real Estate Law
3 Credits Offered as Demand Warrants
Deeds and conveyances, mortgages, liens, rentals, appraisals and other transactions in real estate and law. Also available through the Center for Distance Education. (3+0)

ABUS F230 Applied Intermediate Accounting
3 Credits Offered Spring
Review of accounting principles with emphasis on working capital, plant assets, intangible assets and financial statement presentation. Current accounting pronouncements. (3+0)

ABUS F231 Introduction to Personnel
1-3 Credits Offered as Demand Warrants
Company organizational structure, job analysis, staffing and organization, employee growth and development, employee supervision and developing leadership skills. May be offered in three one credit modules. (1-3+0)

ABUS F232 Contemporary Management Issues
3 Credits Offered Fall
Management functions, including planning, organizing, staffing, directing and controlling, human aspects of management, and decision making. ***Prerequisites: BA F151 or permission of instructor.*** (3+0)

ABUS F233 Financial Management
3 Credits Offered Spring
Internal financial controls, fraud, and internal audit. ***Recommended: Completion of BA F151; ABUS F101 or ACCT F261.*** (3+0)

ABUS F234 Introduction to Investing
3 Credits Offered Fall
An in-depth study of investment for personal use. The overall investment environment is described and conceptual tools needed by investors are presented. Popular investment vehicles such as common stocks, bonds, preferred stocks, convertible securities, and mutual funds are addressed. ***Recommended: ABUS F161.*** (3+0)

ABUS F235 Fund Accounting for Non-Profits
3 Credits Offered Fall
Accounting for nonprofit organizations, governmental units, health care providers, voluntary health and welfare organizations, public schools, colleges, universities and other organizations using fund accounting. ***Prerequisites: ABUS F101.*** (3+0)

ABUS F241 Applied Business Law I
3 Credits Offered Fall
Legal aspects of business problems. Principles, institutions and administration of law in contracts, agency, employment, personal sales and property ownership. Also available through the Center for Distance Education. ***Prerequisites: BA F151.*** (3+0)

ABUS F242 Employment Law
3 Credits Offered as Demand Warrants
Labor and employment law with emphasis on case analysis. ***Recommended: BA F151.*** (3+0)

ABUS F255 Marketing in Tourism
3 Credits Offered as Demand Warrants
Basic principles of marketing for the tourism industry. Emphasis on Alaska as the tourist destination. (3+0)

ABUS F256 Small Hotel, Bed and Breakfast, and Lodge Operations
1-3 Credits Offered as Demand Warrants
Introduction to hospitality industry focusing on the development and operation of small hotels, bed and breakfast accommodations, and lodge operations. May be offered in three 1 credit modules. (1-3+0)

ABUS F260 Marketing Practices
3 Credits
Designed to give students a real-world view of basic marketing principles and practices. Emphasizes planning strategy and application of marketing concepts in analysis of case studies. Examines nature of marketing and its environment, selecting target markets and developing a market mix: product, price, promotion and distribution. (3+0)

ABUS F263 Public Relations
3 Credits Offered Spring
Public relations is image making, repairing and promoting. PR involves promotion, selling, advertising and creating public, corporate, government, church and other institutional images. Public relations professionals need skills in psychology, writing, mass media theory, image construction, persuasion and audience analysis. Introduces public relations and the role it plays in our world and society. ***Recommended: BA F151.*** (3+0)

ABUS F264 Filing/Records Management
3 Credits Offered as Demand Warrants
Instruction in basic alphabetic storage with filing rules and cross-referencing and procedures for retrieving records manually. Includes adaptations of the alphabetic storage method including geographic, numeric and subject; storing and retrieving special records (card files, visible records, microrecords); organization and operation of records management programs and control of records systems. (3+0)

ABUS F265 Seminar in Applied Marketing
3 Credits Offered Spring
Analysis of the managerial relevance of current issues in marketing as found in the professional and/or popular marketing literature. A historical perspective will be provided through classic readings from the literature. Students will be expected to read, analyze and discuss assigned readings in a seminar atmosphere with a view toward understanding the rationale of applied marketing management practices such as theory, marketing mix and ethics. The relation and role of marketing, relative to other functional areas of the firm, will be explored. ***Prerequisites: ABUS F260 or permission of instructor.*** (3+0)

ABUS F267 Transportation and Logistics Management
1-3 Credits Offered as Demand Warrants
Understanding of issues and challenges concerning structure and management of air, sea, rail and highway transportation systems. Emphasis on effective management of the transporting of people and goods intra-Alaska and to destinations that are served from Alaska. ***Prerequisites: ABUS F158 or permission of instructor.*** (1-3+0)

ABUS F269 Food and Beverage Management
1-3 Credits Offered as Demand Warrants
Development of a successful food and beverage system from its inception to operation. Menu planning, purchasing, preparation, service and food/beverage cost control. ***Prerequisites: ABUS F158 or permission of instructor.*** (1-3+0)

ABUS F271 Business Communications
3 Credits Offered as Demand Warrants
Composition and evaluation of various kinds of common communications between a business person and associates, customers and dealers. Included are interoffice memos, letters, reports and oral communications. ***Prerequisites: ABUS F170 or permission of instructor.*** (3+0)

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ABUS F272 **Small Business Planning**
3 Credits Offered Spring
Elements of small business planning processes including the components of a written business plan. (3+0)

ABUS F273 **Managing A Small Business**
3 Credits Offered Spring
Entrepreneurship and management, starting a new business, buying an existing business or franchise. Managing, marketing, staffing, financing, budgeting, pricing, operational analysis and controls. (3+0)

ABUS F274 **E-commerce**
1-3 Credits Offered Fall
Exploration of trends in Internet commerce. Analysis of the elements needed to build and manage a successful e-commerce business. Website planning and creation include information design, navigation design and site presentation. ***Recommended: ABUS F273, BA F151 and CIOS F150.*** (1-3+0)

ABUS F275 **Applied International Business**
3 Credits Offered Spring
Case study and research-oriented approach to cultural, economic, political, social, logistical and other business issues in the ever-changing international business environment. ***Recommended: ABUS F273 and BA F151.*** (3+0)

ABUS F288 **Professional Certification Preparation**
1-3 Credits Offered as Demand Warrants
Prepares students for national or industry specific certification examination. Course may be taken three times for a maximum of 4 credits. Graded Pass/Fail. ***Recommended: Experience or course work in exam area. Course is intended as preparation for certification exam.*** (1-3+0)

ABUS F299 **Practicum in Applied Business**
1-9 Credits
Supervised training and work experience (local or foreign study abroad). Analysis of work experience and relationship of the job to career and academic goals. Managerial concepts, problems of working with groups and individuals, organizational structures, communications and planning. ***Prerequisites: Permission of instructor.*** (0+0)

APPLIED PHOTOGRAPHY

APHO F073 **Process and Print Color Slides**
1 Credit Offered as Demand Warrants
Development of color film, preparation of projection slides, color prints and enlargements, mixing color filters for special effects, and setting up a small home darkroom. Students must have a camera and obtain their own film and film processing. (1+0)

APHO F074 **Process/Print Color Negatives**
1 Credit Offered as Demand Warrants
Developing print film using the Kodak Flexicolor C-41 and Hobby-pac processes. Making proof sheets and enlargements using Extaprint 2, Hobby-pac and Ektaflex processes. Students must have a camera and two rolls of film. (1+0)

ARABIC

ARAB F100A **Elementary Arabic 1A** (h)
3 Credits Offered as Demand Warrants
Designed for beginning students of the Arabic language and culture, with emphasis on the fundamentals of the spoken language, vocabulary and grammatical structure. Does not meet Perspectives on the Human Condition requirements, or Foreign Language major or minor requirements. (3+0)

ARAB F100B **Elementary Arabic 1B** (h)
3 Credits Offered as Demand Warrants
Continuation of ARAB F100A. Increasing emphasis on the fundamentals of the spoken language, vocabulary and grammatical structure, and expanded information on culture. Does not meet Perspectives on the Human Condition requirements, or Foreign Language major or minor requirements. ***Prerequisites: ARAB F100A or permission of instructor.*** (3+0)

ARCTIC SKILLS

A per semester fee for equipment upgrade will be assessed for one or more ARSK, EMS and FIRE courses.

ARSK F147A **Arctic Survival**
1-2 Credits Offered as Demand Warrants
Designed for those individuals traveling for work or recreation in the Arctic. The focus is on preparation and development of knowledge and skills to cope effectively with the difficulties and dangers to which travelers are frequently exposed. Topics include appropriate survival kits, clothing options, nutrition and hydration needs, shelter construction, signal development, cold weather injuries and safety issues related to modes of transportation. The two credit option includes two field practicums. May be repeated for a maximum of 4 credits. Graded Pass/Fail. ***Recommended: College level reading skills.*** (1-2+0)

ARSK F147B **Arctic Survival**
1-2 Credits Offered as Demand Warrants
Designed for those individuals traveling for work or recreation in the Arctic. The focus is on preparation and development of knowledge and skills to cope effectively with the difficulties and dangers to which travelers are frequently exposed. Topics include appropriate survival kits, clothing options, nutrition and hydration needs, shelter construction, signal development, cold weather injuries and safety issues related to modes of transportation. The two credit option includes two field practicums. May be repeated for a maximum of 4 credits. Graded Pass/Fail. ***Recommended: College level reading skills.*** (1-2+0)

ARSK F170 **EMT: Emergency Medical Technician I**
6 Credits
How to provide basic life support such as splinting, hemorrhage control, oxygen therapy, suction, CPR and use of automated external defibrillators (AEDs). EMT I is the foundation of all emergency medical training. Mastering of EMT I level knowledge and techniques must occur before moving on to advanced levels. Special fees apply. Cross-listed with EMS F170. (4+4)

ART

ART F100 **Art Exploration**
3 Credits Offered as Demand Warrants
Exposure to design, printmaking, weaving and sculpture. Individual studio projects, lectures, and field trips introduce areas for further study. (3+0)

ART F101 **Introduction to Ceramics**
3 Credits Offered as Demand Warrants
Making and firing clay objects. Study of clay methods, forming decorations, glazing and firing. For beginning students only. (3+0)

ART F104 **Introduction to Drawing**
1-3 Credits Offered as Demand Warrants
Still life, portrait, interior and landscape compositions using basic drawing materials. Emphasizes self-expression by developing spontaneous artistic ideas into a more focused style. For the student with little or no training in drawing to explore his or her drawing abilities. (1-3+0)

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ART F105 **Beginning Drawing** (h)
3 Credits
Basic elements in drawing. Emphasis on a variety of techniques and media. Special fees apply. (1+4)

ART F113 **Introduction to Painting**
1-3 Credits Offered as Demand Warrants
Investigation of basic materials, various media and techniques available for painting. (1-3+2)

ART F122 **Introduction to Stained Glass** (h)
1-3 Credits Offered as Demand Warrants
Fundamental skills to construct stained glass pieces. Basics of glass cutting, leading and soldering. Each student completes a one square-foot window, a large group project and a sun catcher. (2+4)

ART F125 **Aleut Basketry Practicum** (h)
1 Credit Offered as Demand Warrants
Introduction to techniques of Aleut basketry, including design elements and Attu, Atka and Unalaska style lids and knobs. Historical and artistic overview of the art form. Offered at Aleutian/Regional Center only. (0+3)

ART F127 **Introduction to Weaving** (h)
3 Credits
Fundamentals of weaving taught through basic techniques and processes for four-shaft loom woven structures. Includes loom terminology and function, warping and threading, basic pattern drafting and designing, color and texture. Introduces tapestry techniques. (1+4)

ART F161 **Two-Dimensional Design** (h)
3 Credits
Fundamentals of pictorial form; principles of composition, organization, and structure. Special fees apply. (1+4)

ART F162 **Color and Design** (h)
3 Credits
Fundamentals of color principles and interactions. Emphasis on two dimensions. Special fees apply. (1+4)

ART F163 **Three-Dimensional Design** (h)
3 Credits
Provides an introduction to fundamental concepts and organization of three-dimensional forms, which include but are not limited to the applied arts and industrial design. Various materials such as clay, glass, metal and wood will be utilized. Special fees apply. (1+4)

ART F200X **Aesthetic Appreciation: Interrelation of Art, Drama, and Music** (h)
3 Credits
Understanding and appreciation of art, drama, and music through an exploration of their relationships. Topics include the creative process, structure, cultural application and diversity, the role of the artist in society, and popular movements and trends. ***Prerequisites: placement in ENGL F111X or higher; sophomore standing; or permission of instructor.*** Cross-listed with MUS F200X; THR F200X. (3+0)

ART F201 **Beginning Ceramics** (h)
3 Credits
Foundation experience with clay. Overview of the medium of ceramics and its possibilities. Special fees apply. ***Prerequisites: ART F105; ART F161 or ART F162 or ART F163; or permission of instructor.*** (1+4)

ART F205 **Intermediate Drawing** (h)
3 Credits
Exploration of pictorial composition and creative interpretation of subjects. Special fees apply. ***Prerequisites: ART F105.*** (1+4)

ART F207 **Beginning Printmaking** (h)
3 Credits
Concepts and techniques of printmaking. Subject areas taken from relief, intaglio, serigraphy and lithography. Special fees apply. ***Prerequisites: ART F105; ART F161 or ART F162 or ART F163; or permission of instructor.*** (1+4)

ART F209 **Beginning Metalsmithing and Jewelry** (h)
3 Credits
Basic techniques of fine metalsmithing and jewelry. Special fees apply. ***Prerequisites: ART F105; ART F161 or ART F162 or ART F163; or permission of instructor.*** (1+4)

ART F211 **Beginning Sculpture** (h)
3 Credits
Basic sculpture techniques and principles. Special fees apply. ***Prerequisites: ART F105; ART F161 or ART F162 or ART F163; or permission of instructor.*** (1+4)

ART F213 **Beginning Painting (Acrylic or Oil)** (h)
3 Credits
Basic materials and techniques in either medium. Pictorial principles and organization of paintings. ***Prerequisites: ART F105; ART F161 or ART F162 or ART F163; or permission of instructor.*** (1+4)

ART F223 **Watercolor Painting** (h)
3 Credits Offered as Demand Warrants
Painting in various transparent and opaque media (watercolor, tempera, polymer, casein). Emphasis on techniques and subjects. ***Prerequisites: ART F105; ART F161 or ART F162 or ART F163; or permission of instructor.*** (1+4)

ART F227 **Woven Fabric Design** (h)
3 Credits
Continuation of ART F127. Exploration of color and texture in loom structures. Includes basic fiber technology and color theory. Topics vary each semester and include blocks, units, laces, twills and R.A.G.S. recycle. Course may be repeated for credit when topic changes. ***Prerequisites: ART F127.*** (1+4)

ART F233 **Beginning Field Painting** (h)
1 Credit Offered as Demand Warrants
Introductory course consists of three or four days painting at outdoor locations, usually in the summer. Lectures and directed study are used to establish student understanding of landscape painting from drawing and/or small painted studies to finished oil and acrylic paintings. Use of basic painting and drawing materials will be covered. Concepts of space, light, color, composition, scale and specific elements of landscape paintings such as water, reflections, skies, aerial and linear perspective will be addressed. Sessions will be in the field with some supporting sessions in the studio. Courses in the past have been held at Denali, McCarthy, Brooks Range, Valdez and Cordova. ***Recommended: ART F105; ART F213.*** (0.5+1.5)

ART F247 **Introduction to Theatrical Design** (h)
3 Credits Offered Fall
Introduction to all the design elements used in the theatre. Analysis of line, texture, color, and how they relate to designing for the theatre including costumes, scenery and lighting. Cross-listed with THR F247. (3+0)

ART F261 **History of World Art** (h)
3 Credits Offered Spring
Origins of art and its development from the beginning through contemporary painting, sculpture and architecture. ART F261-262 may be taken in reverse order; however, course content is presented in a chronological sequence beginning with fall semester. ***Prerequisites: Sophomore standing.*** (3+0)

ART F262 **History of World Art** (h)
3 Credits Offered Spring
Origins of art and its development from the beginning through contemporary painting, sculpture and architecture. ART F261-262 may be taken in reverse

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order; however, course content is presented in a chronological sequence beginning with fall semester. ***Prerequisites: Sophomore standing.*** (3+0)

ART F268 **Beginning Native Art Studio** (h)
3 Credits
Understanding and applying the traditional designs and technologies of Native art. Special fees apply. ***Prerequisites: ART F105 or permission of instructor.*** Cross-listed with ANS F268. (1+4)

ART F301 **Intermediate Ceramics** (h)
3 Credits
Continuation of beginning ceramics. Emphasis on developing proficiency in ceramic studio practices and processes. Special fees apply. ***Prerequisites: ART F201 or permission of instructor.*** (1+4)

ART F305 **Advanced Drawing** (h)
3 Credits Offered Spring
Development and refinement of individual problems in drawing. Can be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F205 or permission of instructor.*** (1+4)

ART F307 **Intermediate Printmaking** (h)
3 Credits
Continuation of ART F207 with emphasis on refinement of technique and color printing. Special fees apply. ***Prerequisites: ART F207 or permission of instructor.*** (1+4)

ART F309 **Intermediate Metalsmithing and Jewelry** (h)
3 Credits
Further investigation of material processes and techniques; some emphasis on design. Special fees apply. ***Prerequisites: ART F209 or permission of instructor.*** (1+4)

ART F311 **Intermediate Sculpture** (h)
3 Credits
Exploration in materials and concepts of sculpture. Emphasis on personal creativity and skill development. Special fees apply. ***Prerequisites: ART F211 or permission of instructor.*** (1+4)

ART F313 O **Intermediate Painting** (h)
3 Credits
Continued development of expressive skills in painting in any media. Emphasis on pictorial and conceptual problems. ***Prerequisites: ART F213; COMM F131X or COMM F141X.*** (1+4)

ART F324 **Watercolor Painting and Composition** (h)
3 Credits Offered Every Third Spring
Development of individual approach to watercolor media. Can be repeated for credit with permission of instructor. ***Prerequisites: ART F223.*** (1+4)

ART F333 **Intermediate Field Painting** (h)
1 Credit Offered as Demand Warrants
Intermediate course consists of three or four days painting at outdoor locations, usually in the summer. Lectures and directed study are used to broaden student understanding of landscape painting from drawings and/or small painted studies to finished oil and acrylic paintings. Concepts of space, light, color, composition, scale and specific elements of landscape paintings such as water, reflections, skies, aerial and linear perspective will be addressed. Sessions will be in the field with some supporting sessions in the studio. Courses in the past have been held at Denali, McCarthy, Brooks Range, Valdez and Cordova. ***Prerequisites: ART F213 or ART F233. Recommended: ART F105; ART F205.*** (0.5+1.5)

ART F347 O **Lighting Design** (h)
3 Credits Offered Fall Even-numbered Years
Principles and techniques of theatrical lighting design. The student will conduct practical experiments and design projects applying the experience gained. Student will spend approximately $40 for materials for this class. Also available through the Center for Distance Education. ***Prerequisites: COMM F131X or COMM F141X; THR F343; or permission of instructor. May be taken concurrently with THR F343.*** Cross-listed with FLM F347; JRN F347; THR F347. (3+0)

ART F360 **Indigenous Art and Culture** (h)
3 Credits Offered as Demand Warrants
Overview of the aesthetic expressions of the cultures of Africa, Oceania and Native North America. Cultural and social factors will be studied through the visual art from these areas. Cross-listed with ANTH F360. (3+0)

ART F363 W **History of Modern Art** (h)
3 Credits Offered Spring Odd-numbered Years
Development of modern art forms and theories in the visual arts from the late 19th century to the present. Concentration on the artistic pluralism of 20th century art forms: Cubism, Futurism, Surrealism, Expressionism, Constructivism, Nonobjective Art, Abstract Expressionism, Pop Art, Realism and many other "isms." ***Prerequisites: ART F262; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (3+0)

ART F364 W **Italian Renaissance Art** (h)
3 Credits Offered Spring Even-numbered Years
Development of the Renaissance from early Florentine to the High Renaissance of Venice. Study of art by Massacio, Michelangelo, DaVinci, Titian, etc. ***Prerequisites: ART F261; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (3+0)

ART F365 W **Native Art of Alaska** (h)
3 Credits Offered Fall
Art forms of the Eskimo, Indian and Aleut from prehistory to the present. Changes in forms through the centuries. ***Prerequisites: Advanced standing or permission of instructor.*** Cross-listed with ANS F365; ANTH F365. (3+0)

ART F366 **Northwest Coast Indian Art** (h)
3 Credits Offered as Demand Warrants
Arts of the Northwest Coast Indians and the place of art in their culture. Cross-listed with ANS F366; ANTH F366. (3+0)

ART F367 **Eskimo Art** (h)
3 Credits Offered Spring Even-numbered Years
Eskimo art from Alaska, Canada and Siberia beginning with the earliest known pieces to the beginning of the 20th century. Cross-listed with ANS F367; ANTH F367. (3+0)

ART F368 **Intermediate Native Art Studio** (h)
3 Credits
Understanding and applying advanced traditional designs and technologies of Native art. Special fees apply. ***Prerequisites: ART F268 or permission of instructor.*** Cross-listed with ANS F368. (1+4)

ART F371 O **Digital Photography and Pixel Painting**
3 Credits
An introduction to the world of digital imaging with applications in fine and commercial art. It is expected that students will become competent at creating real-looking images of impossible subjects as well as detecting their creation by others. The varied ethical issues engendered by this expertise will be addressed in depth. Students will be required to gain proficiency in visual design for electronic and print publication. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; Macintosh OS or Windows OS experience with graphic applications; one college level studio art course.*** Cross-listed with JRN F371; FLM F371. (1+4)

ART F401 **Advanced Ceramics** (h)
3 Credits
Emphasis on developing as aesthetically perceptive and technically proficient ceramic artist. Individual and group projects include kiln firings. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F301 or permission of instructor.*** (1+4)

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ART F402 **Anthropology of Art** (s)
3 Credits Offered as Demand Warrants
Anthropological study of art in cross-cultural perspective. Social context of art production and use, cross-cultural variations in definition of an artist's role. ***Prerequisites: Senior standing or permission of instructor.*** Cross-listed with ANTH F402. Stacked with ANTH F602. (3+0)

ART F407 O **Advanced Printmaking** (h)
3 Credits
Individual development of technical and creative processes. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F307; COMM F131X or COMM F141X.*** (1+4)

ART F409 **Advanced Metalsmithing and Jewelry** (h)
3 Credits
Materials and processes; introduction to holloware skills and forging. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F309 or permission of instructor.*** (1+4)

ART F411 **Advanced Sculpture** (h)
3 Credits
Principles, practices and concepts of sculpture. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F311 or permission of instructor.*** (1+4)

ART F413 O **Advanced Painting** (h)
3 Credits
Individual experimentation and technical/conceptual development in painting. Can be repeated for credit with permission of instructor. ***Prerequisites: ART F313; COMM F131X or COMM F141X.*** (1+4)

ART F417 **Lithography** (h)
3 Credits Offered Every Third Spring
An exploration of stone and metal plate lithography. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F105; ART F207; or permission of instructor.*** (1+4)

ART F419 **Life Drawing** (h)
3 Credits
Drawing from life; study of artistic anatomy. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F305 or permission of instructor.*** (1+4)

ART F424 O **Field Artists of the North** (h)
3 Credits Offered as Demand Warrants
Study of field artists and their work, from the explorer artists of yesteryear to today's field artists using a variety of traditional and contemporary media in their creations. Students will conceive and conduct their own study projects, producing a body of work that will demonstrate the principles and practice of a field artist. ***Prerequisites: ART F105; a studio art course (ART F161, ART F162, ART F163, ART F205, ART F211, ART F213 or JRN F203); COMM F131X or COMM F141X.*** Stacked with ART F624; NORS F624. (3+0)

ART F425 W **Visual Images of the North**
3 Credits
Examination of the imagery of the people and landscapes of the polar regions, centering on such issues as depiction of arctic peoples and customs by Europeans, documentary versus artistic goals, translations from original sketches to published images, relationship of polar imagery to prevailing historical styles and the influence of changing world views on modes of polar representation between the 16th and 20th centuries. ***Prerequisites: ENGL F111X; ENGL F211X or F213X; or permission of instructor.*** Cross-listed with NORS F425. (3+0)

ART F427 **Relief** (h)
3 Credits Offered Every Third Fall
Woodcut and monotype with emphasis on color. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F105; ART F207; ART F213; or permission of instructor.*** (1+4)

ART F433 **Advanced Field Painting** (h)
1 Credit Offered as Demand Warrants
Advanced course consists of three or four days painting at outdoor locations, usually in the summer. Lectures and directed study are used to broaden and develop student understanding of landscape painting from drawings and/or small painted studies to finished oil and acrylic paintings. Concepts of space, light, color, composition, scale and specific elements of landscape paintings such as water, reflections, skies, aerial and linear perspective will be addressed. Emphasis will be on individual experimentation and technical/conceptual development. Sessions will be in the field with some supporting sessions in the studio. Courses in the past have been held at Denali, McCarthy, Brooks Range, Valdez and Cordova. ***Prerequisites: ART F313 or ART F333.*** (0.5+1.5)

ART F437 **Intaglio** (h)
3 Credits
Intaglio printmaking with emphasis on experimentation and color photo intaglio printing. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F105; ART F162; ART F207; or permission of instructor.*** (1+4)

ART F441 **Lost Wax Casting** (h)
3 Credits Offered Every Third Spring
Design and execution of jewelry and other small metal objects by lost wax casting. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F409 or permission of instructor.*** (1+4)

ART F442 **Nonferrous Forging** (h)
3 Credits Offered Every Third Spring
Design and execution of hammer-forged nonferrous metal objects. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F409 or permission of instructor.*** (1+4)

ART F447 **Silkscreen** (h)
3 Credits Offered as Demand Warrants
Silkscreen printing with photo process. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F105; ART F162; ART F207; or permission of instructor.*** (1+4)

ART F450 **Raku Pottery** (h)
3 Credits Offered as Demand Warrants
Raku clay bodies, glazes and decorations. Kiln building. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F201 or permission of instructor.*** (1+4)

ART F451 **Earthenware** (h)
3 Credits Offered as Demand Warrants
Earthenware clay bodies, glazes, decorations and firing techniques. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F201 or permission of instructor.*** (1+4)

ART F452 **Porcelain** (h)
3-12 Credits Offered as Demand Warrants
Porcelain clay bodies, glazes, decorations and firing techniques. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F201 or permission of instructor.*** (1+4)

ART F453 **Kiln Design and Construction** (h)
3 Credits Offered as Demand Warrants
Kiln design and construction including building and firing a kiln. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F201 or permission of instructor.*** (1+4)

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ART F457 O **Papermaking** (h)
3 Credits Offered as Demand Warrants
Production of paper from rags and linters for use as an end in itself as well as a support for art. Two- and three-dimensional projects are required. Experimentation is encouraged. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F105; ART F207; ART F163 or ART F211; COMM F131X or COMM F141X; or permission of instructor.*** (1+4)

ART F458 O **Elementary Internship**
3-15 Credits
Supervised teaching in elementary schools approved by the School of Education. Students should expect to be involved in the school setting for some or all of the school day (depending on the number of credits taken) for the entire university semester. The School of Education may limit enrollment, determine assignments and cancel the registration of students doing unsatisfactory work. Graded Pass/Fail. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; successful completion of methods practicum and methods course-work with a C or better. Post-baccalaureate students must be admitted to the Art K-12 licensure program. Passing Praxis I scores.*** Cross-listed with ED F452. (1+0+42)

ART F459 O **Secondary Internship**
3-15 Credits
Supervised teaching in secondary schools approved by the School of Education. Students should expect to be involved in the school setting for some or all of the school day (depending upon number of credits taken) for the entire university semester. The School of Education may limit enrollment, determine assignments and cancel the registration of students doing unsatisfactory work. Graded Pass/Fail. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; successful completion of methods practicum and methods course work with a C or better. Post-baccalaureate students must be admitted to K-12 Art licensure program. Passing Praxis I scores.*** Cross-listed with ED F453. (1+0+42)

ART F463 **Seminar in Art History** (h)
3 Credits Offered Fall Odd-numbered Years
A seminar providing a forum for discussion of a particular historical period or art historical idea. Topics vary each semester and will not be repeated during a two-year period. Topics include: art since 1945, women in twentieth-century art, the American landscape tradition, etc. Stacked with ART F663. (3+0)

ART F467 **Photoprocess Printmaking** (h)
3 Credits Offered Every Third Spring
Production of etchings, lithographs and silkscreen prints using photo mechanical processes. Elements of electrophotography and desktop publishing explored. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F105; ART F262; ART F207; or permission of instructor.*** (1+4)

ART F468 **Advanced Native Art Studio** (h)
3 Credits
Advanced traditional designs and technologies of Native art. Use of contemporary materials to interpret traditional forms. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F368 or permission of instructor.*** Cross-listed with ANS F468. (1+4)

ART F469 W **Architecture: Art, Design, Technology and Social Impact** (h)
3 Credits Offered Spring Even-numbered Years
Concepts of environmental, urban and industrial design. Relationship of human and natural environment is stressed in this history of architecture with special attention given to contemporary conditions in urban areas and effects of industrialization and mechanization on human living and working spaces, artistic design and aesthetics. ***Prerequisites: ART F261 and ART F262 or HUM F201X and HUM F202; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** Cross-listed with HUM F469. (3+0)

ART F471 O **Advanced Digital Design** (h)
3 Credits Offered Spring
Project-oriented class in graphic design with applications from journalism to fine and commercial art. Students will be expected to have a background in programs likely to include web design, digital photography and graphic design. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; JRN F250; JRN F350 or ART F371 or JRN F371; one college level studio art course.*** Cross-listed with JRN F471. (1+4)

ART F472 O **Visualization and Animation** (h)
3 Credits Offered Fall
An introduction to visualization and animation with applications in fine and commercial art and science. Students will produce a series of three dimensional animation projects which will introduce them to the tools and concepts used by animation and visualization professionals. Note: May be repeated for credit. Special fees apply. ***Prerequisites: ART F371 or equivalent; COMM F131X or COMM F141X.*** Cross-listed with FLM F472; JRN F472. (1+4)

ART F474 W **History of the Role of the Artist** (h)
3 Credits Offered Spring Even-numbered Years
Survey of theory and practices of professional training and education of the artist in relationship to political, social and philosophical conditions. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor. Recommended: ART F261; ART F262.*** Stacked with ART F673. (3+0)

ART F475 **Digital Video Compositing** (h)
3 Credits Offered as Demand Warrants
Digital compositing techniques for creating moving imagery. The course covers video manipulation, layering images, synthesizing realistic video imagery, integration of live action and computer generated animation. Course can be repeated for a total of nine credits with permission of instructor. ***Prerequisites: ART F472 or JRN F472 or FLM F472 or equivalent.*** Cross-listed with FLM F475. (1+4)

ART F477 **Monotypes and Monoprints** (h)
3 Credits Offered as Demand Warrants
Exploration and practice of creating singular, unique prints, which are not expected to be editioned. Contemporary and traditional techniques practiced with an emphasis on drawing, color and design in the finished print compositions. Special fees apply. ***Prerequisites: ART F105. Recommended: ART F161 or ART F162; ART F207.*** (1+4)

ART F484 **Multimedia Theory and Practice** (h)
3 Credits Offered Spring
Study of techniques needed to produce multimedia with a special project for a university or community agency as the required final project. For the purpose of this course multimedia is defined as computer-based, user-driven products with audio, visual and text components and also video or film where appropriate. Primary program is Flash. Special fees apply. ***Prerequisites: Understanding of computer graphics [programs like Illustrator, Freehand, etc.] plus some mastery of a specialty like writing, art, or television production.*** Cross-listed with JRN F484. Stacked with ART F684; JRN F684. (3+3)

ART F490 **Current Problems**
3 Credits Offered Fall Even-numbered Years
A forum for discussion of those aesthetic and professional problems confronted by artists. Topics are agreed upon by instructor and students, and students research and lead discussion on these topics. Topics may include: approaches to figuration of contemporary painting and sculpture, health hazards for the professional artist, portfolio development and access to galleries, making art far from major cultural centers, etc. Stacked with ART F690. (3+0)

ART F499 **Thesis Project**
1-3 Credits
Directed work toward individual exhibition; completed outside regularly scheduled classes. Required for B.F.A. candidates. ***Prerequisites: Senior standing.*** (0+0)

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ART F601 **Ceramics**
1-6 Credits Offered as Demand Warrants
Exploration of selected topics in ceramics with lectures, demonstrations, independent research and production of ceramics at a level commensurate with graduate standing. May be repeated for credit. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** (0+0)

ART F603 **Graduate Photography**
2-6 Credits Offered as Demand Warrants
Exploration of selected topics in photography, with lectures, demonstrations, independent research and production of photography at a level commensurate with graduate standing. May be repeated for credit. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** (1+2-8)

ART F605 **Drawing**
1-6 Credits Offered as Demand Warrants
Exploration of topic in general drawing with lectures, demonstrations and independent research and production of drawing at a level commensurate with graduate standing. May be repeated for credit. ***Prerequisites: ART F305 or equivalent; and graduate standing.*** (0+0)

ART F607 **Printmaking**
1-6 Credits Offered as Demand Warrants
Exploration of selected topics in printmaking with lectures, demonstrations, independent research and production of printmaking at a level commensurate with graduate standing. May be repeated for credit. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** (0+0)

ART F609 **Metalsmithing**
1-6 Credits Offered as Demand Warrants
Exploration of selected topics in metalcraft with lectures, demonstrations, independent research and production of metalcraft at a level commensurate with graduate standing. May be repeated for credit. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** (0+0)

ART F611 **Sculpture**
1-6 Credits Offered as Demand Warrants
Exploration of selected topics in sculpture with lectures, demonstrations, independent research and production of sculpture at a level commensurate with graduate standing. May be repeated for credit. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** (0+0)

ART F613 **Painting**
1-6 Credits Offered as Demand Warrants
Exploration of selected topics in painting with lectures, demonstrations, independent research and production of painting at a level commensurate with graduate standing. May be repeated for credit. ***Prerequisites: Graduate standing or permission of instructor.*** (0+0)

ART F619 **Life Drawing**
1-6 Credits
Exploration of selected topics in drawing with lectures, demonstrations, independent research and production of drawing at a level commensurate with graduate standing. May be repeated for credit. ***Prerequisites: Graduate standing or permission of instructor.*** (0+0)

ART F624 **Field Artists of the North**
3 Credits Offered as Demand Warrants
Study of field artists and their work, from the explorer artists of yesteryear to today's field artists using a variety of traditional and contemporary media in their creations. Students will conceive and conduct their own study projects, producing a body of work that will demonstrate the principles and practice of a field artist. ***Prerequisites: ART F105 and a studio art course (ART F161, ART F162, ART F163, ART F205, ART F211, ART F213 or JRN F203.)*** Cross-listed with NORS F624. Stacked with ART F424. (3+0)

ART F625 **Visual Images of the North**
3 Credits Offered Spring Odd-numbered Years
Examination of the two-dimensional imagery of the people and landscapes of the polar regions, centering on such issues as depiction of arctic peoples and customs by Europeans, documentary vs. artistic goals, translations from original sketches to published images, relationship of polar imagery to prevailing historical styles, and the influence of changing world views on modes of polar representation between the 16th and 20th centuries. Cross-listed with NORS F625. (3+0)

ART F633 **Graduate Field Painting** (h)
1 Credit
Consists of three or four days painting at outdoor locations, usually in the summer. Lectures and directed study are used to further develop understanding of landscape painting from drawings and/or small painted studies to finished oil and acrylic paintings. Concepts of space, light, color, composition, scale and specific elements of landscape paintings such as water, reflections, skies, aerial and linear perspective will be addressed. Emphasis will be on individual experimentation and technical/ conceptual development consistent with graduate level art courses. Sessions will be in the field with some supporting sessions in the studio. Courses have been held at Denali, McCarthy, Brooks Range, Valdez and Cordova ***Prerequisites: ART F413; ART F433; or permission of instructor.*** (6+21)

ART F648 **Native Arts**
1-6 Credits
Advanced traditional designs and technologies of Native art. Use of contemporary materials to interpret traditional forms. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ART F468; graduate standing; or permission of instructor.*** (0+0)

ART F661 **Mentored Teaching in Art**
1 Credit Offered as Demand Warrants
Mentored teaching provides consistent contact of course-related issues between teaching assistants and mentoring faculty. Graduates are required to be enrolled in a mentored teaching section while teaching. Graded Pass/ Fail. ***Prerequisites: Graduate standing or permission of instructor. Note: May be repeated for credit.*** (1+0)

ART F663 **Seminar in Art History**
3 Credits Offered Fall Odd-numbered Years
A forum for discussion of a particular historical period or art historical idea. Topics vary each semester and will not be repeated during a two-year period. Topics include art since 1945, women in twentieth-century art, the American landscape tradition, etc. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with ART F463. (3+0)

ART F671 **Two -and Three-Dimensional Computer Design**
1-6 Credits
Visualization and animation with applications to two- and three-dimensional computer design and typography. Emphasis on visual design for electronic and print publication. Includes animation of the components of 3-D models. May be repeated for credit. Special fees apply. ***Prerequisites: ART F471; graduate standing; or permission of instructor.*** (0+0)

ART F672 **Advanced Computer Visualization in Art**
1-6 Credits Offered as Demand Warrants
Computer visualization in art with production and reproduction of projects chosen from a wide range of topics. Includes lectures, demonstrations and laboratory experience. May be repeated for credit. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** (0+0)

ART F673 **History of the Role of the Artist**
3 Credits Offered Spring Even-numbered Years
Survey of theory and practices of professional training and education of the artist in relationship to political, social and philosophical conditions. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with ART F474. (3+0)

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ART F684 **Multimedia Theory and Practice**
3 Credits Offered Spring
Study of techniques needed to produce multimedia with a special project for some university or community agency as the required final project. For the purpose of this course multimedia is defined as computer based, user-driven products with audio, visual and text components, and also video or film where appropriate. Primary program is Flash. Special fees apply. ***Prerequisites: Understanding of computer graphics (programs like Illustrator, Freehand, etc.) plus some mastery of a specialty like writing, art, or television production.*** Cross-listed with JRN F684. Stacked with ART F484; JRN F484. (3+0)

ART F690 **Current Problems**
3 Credits Offered Fall Even-numbered Years
A forum for discussion of aesthetic and professional problems confronted by artists. Topics are agreed upon by instructor and students, and students research and lead discussion on these topics. Topics may include: approaches to figuration of contemporary painting and sculpture, health hazards for the professional artist, portfolio development and access to galleries, making art far from major cultural centers, etc. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with ART F490. (3+0)

ATMOSPHERIC SCIENCE

ATM F101X **Weather and Climate of Alaska** (n)
4 Credits Offered Spring
Focus on the Alaska atmosphere as an important part of our environment. Includes fundamental laws of physics and chemistry, the behavior of atmospheres on rotating planets, clouds, precipitation and weather systems. Includes societal impacts of weather worldwide and investigations into global climate change. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+3)

ATM F401 **Introduction to Atmospheric Science**
3 Credits Offered Fall
Fundamentals of atmospheric science. Includes energy and mass conservation, internal energy and entropy, atmospheric water vapor, cloud microphysics, equations of motion, hydrostatics, phase oxidation, heterogeneous chemistry, the ozone layer, fundamentals of biogeochemical cycles, solar and terrestrial radiation and radiative-convective equilibrium. Also includes molecular, cloud and aerosol absorption and scattering. ***Prerequisites: CHEM F105X; CHEM F106X; MATH F302; PHYS F212X.*** Stacked with ATM F601; CHEM F601. (3+0)

ATM F413 **Atmospheric Radiation**
3 Credits Offered Fall Odd-numbered Years
Atmospheric radiation including the fundamentals of blackbody radiation theory and radiative properties of atmospheric constituents. Discussion of gaseous absorption including line absorption, broadening effects and radiative transfer. Includes scattering, radiative properties of clouds and radiation climatology. ***Prerequisites/Co-requisites: ATM F401.*** Stacked with ATM F613. (3+0)

ATM F444 **Synoptic Analysis and Forecasting**
3 Credits Offered Spring Even-numbered Years
Weather systems and the techniques used to understand and predict their behavior. Topics include atmospheric observations, synoptic analysis techniques, satellite image interpretation, kinematics, fronts and frontogenesis, life cycles of extratropical cyclones, mesoscale phenomena, numerical weather prediction and interpretation of forecast products. ***Prerequisites: ATM F401; ATM F445.*** Stacked with ATM F644. (3+0)

ATM F445 **Atmospheric Dynamics**
3 Credits Offered Fall Even-numbered Years
Fundamentals of equations of motion, conservation laws, balance relationships and coordinate systems. Vorticity dynamics includes vortex filaments and tubes, vorticity equations, Rossby-Haurwitz waves, Ertel's PV principle for the potential vorticity, EPV in isentropic coordinates. Includes balance and quasi-geostrophy, QG theory, scaling of the QG system, the w equation, QG and numerical modeling. ***Prerequisites/co-requisites: ATM F401.*** Stacked with ATM F645. (3+0)

ATM F456 **Climate and Climate Change**
3 Credits Offered Fall Odd-numbered Years
The climate of planet Earth and its changes with time. Radiative fluxes, greenhouse effects, energy budget, hydrological cycle, the atmospheric composition and climatic zones. Physical and chemical reasons for climatic change. ***Prerequisites: Any 400 level Physics or Chemistry course or ATM F401 or permission of instructor; basic computer skills.*** (3+0)

ATM F488 **Undergraduate Research**
1-3 Credits
Advanced research topics from outside the usual undergraduate requirements. ***Prerequisites: Permission of instructor. Recommended: A substantial level of technical/scientific background.*** (0+0)

ATM F601 **Introduction to Atmospheric Science**
3 Credits Offered Fall
Fundamentals of atmospheric science. Includes energy and mass conservation, internal energy and entropy, atmospheric water vapor, cloud microphysics, equations of motion, hydrostatics, phase oxidation, heterogeneous chemistry, the ozone layer, fundamentals of biogeochemical cycles, solar and terrestrial radiation and radiative-convective equilibrium. Also includes molecular, cloud and aerosol absorption and scattering. ***Prerequisites: Graduate standing.*** Cross-listed with CHEM F601. Stacked with ATM F401. (3+0)

ATM F606 **Atmospheric Chemistry**
3 Credits Offered Spring Odd-numbered Years
Chemistry of the lower atmosphere (troposphere and stratosphere) including photo chemistry, kinetics, thermodynamics, box modeling, biogeochemical cycles and measurements techniques for atmospheric pollutants. Study of important impacts to the atmosphere which result from anthropogenic emissions of pollutants, including acid rain, the "greenhouse" effect, urban smog and stratospheric ozone depletion. ***Prerequisites/co-requisites: ATM F601 or permission of instructor.*** Cross-listed with CHEM F606. Stacked with CHEM F406. (3+0)

ATM F613 **Atmospheric Radiation**
3 Credits Offered Fall Odd-numbered Years
Fundamentals of blackbody radiation theory and radiative properties of atmospheric constituents. Discussion of gaseous absorption including line absorption, broadening effects and radiative transfer. Includes scattering, radiative properties of clouds, and radiation climatology. ***Prerequisites/co-requisites: ATM F601; graduate standing.*** Stacked with ATM F413. (3+0)

ATM F615 **Cloud Physics**
3 Credits Offered Spring Even-numbered Years
Basic properties of condensed water vapor in the atmosphere. Formation and behavior of clouds including the nature of atmospheric aerosols, nucleation and growth of water droplets and ice crystals, the development of precipitation, nature of mixed-phase (water and ice) clouds, how transfer of radiation depends on the character of clouds, and how humans are modifying clouds and precipitation both intentionally and unintentionally. Field trips will collect data at the Arctic Facility for Atmospheric Remote Sensing (AFARS). Microscopic examination and have available for use of a sophisticated cloud model. ***Prerequisites: ATM F601; graduate standing; or permission of instructor.*** (3+0)

ATM F620 **Climate Journal Club Seminar**
1 Credit Offered Spring
The "Climate Group" is in informal meeting for researchers and graduate students. The seminars alternate between progress reports on ongoing research and journal club contributions. The main interests articles, formal and informal presentation by locals and visitors will be on the agenda. Participating students will be exposed to a free format discussion of modern ideas in climate related disciplines. All students are encouraged to contribute and students

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taking the course for credit are required to lead the discussion for one session. This may include the presentation of a research plan/results, or a discussion of a journal article. Students will be graded on at least one presentation and participation in the class. Graded Pass/Fail. ***Prerequisites: Graduate standing or permission of instructor.*** (1+0)

ATM F621 **Introduction to Computational Meteorology**
1 Credit Offered Fall
Introduce the basic knowledge on how to apply software related to atmospheric sciences problems. This includes knowledge of UNIX/LINUX, FORTRAN90, IDL, ncl, Mathlab and how to read NetCDF files, grib-files, etc., which are special data formats in which climate data are available. Students will learn how to run given software products on UNIX/LINUX and other platforms and basic tools to modify these programs for their purposes. ***Prerequisites: Graduate standing*** (1+0)

ATM F624 **Oceanic-Atmospheric Gravity Waves**
3 Credits Offered Spring; As Demands Warrants
An introduction to the dynamics of surface and internal gravity waves in non-rotating and rotating fluids including, derivation/solutions of the wave equation, approximations to the governing equations, particle motions and wave energetics, dispersion relationships, phase and group velocities, normal mode and WKB theory, refraction, reflection, critical layer absorption, wave instabilities. ***Prerequisites: MSL F620; MATH F302; or permission of instructor.*** Cross-listed with MSL F624. (3+0)

ATM F631 **Environmental Fate and Transport**
3 Credits Offered Spring Even-numbered Years
Examination of the physical properties that govern the behavior, fate and transport of contaminants released into the environment. Topics include air-water partitioning and exchange, organic solvent-water partitioning, diffusion, sorption, chemical and biological transformation reactions, and modeling concepts. Cross-listed with CHEM F631. (3+0)

ATM F644 **Synoptic Analysis and Forecasting**
3 Credits Offered Spring Even-numbered Years
Weather systems and the techniques used to understand and predict their behavior. Topics include atmospheric observations, synoptic analysis techniques, satellite image interpretation, kinematics, fronts and frontogenesis, life cycles of extratropical cyclones, mesoscale phenomena, numerical weather prediction and interpretation of forecast products. ***Prerequisites: ATM F601; ATM F645.*** Stacked with ATM F444. (3+0)

ATM F645 **Atmospheric Dynamics**
3 Credits Offered Fall Even-numbered Years
Examination of the fundamental forces and basic conservation laws that govern the motion of the atmosphere. Topics include momentum, continuity equations, circulation, vorticity, thermodynamics, the planetary boundary layer and synoptic scale motions in mid-latitudes. ***Prerequisites/co-requisites: ATM F601; graduate standing.*** Stacked with ATM F445. (3+0)

ATM F646 **Atmospheric Dynamics II**
3 Credits Offered Spring Odd-numbered Years
Continuation of ATM F645. Includes geophysical fluid dynamics as applied to the atmosphere. Topics include linear perturbation theory, gravity waves, Rossby waves, numerical weather prediction, baroclinic instability, frontogenesis, general circulation, stratospheric and tropical dynamics. ***Prerequisites: Graduate standing.*** (3+0)

ATM F656 **Climate and Climate Change**
3 Credits Offered Fall Odd-numbered Years
The climate of planet Earth and its changes with time. Radiative fluxes, greenhouse effects, energy budget, hydrological cycle, the atmospheric composition and climatic zones. Physical and chemical reasons for climatic change. ***Prerequisites: Graduate standing; calculus, physics or related courses at F400-level, basic computer skills. Recommended: ATM F601 or ATM F401; basic computer knowledge to plot and analyze climate data.*** (3+0)

ATM F662 **Numerical Modeling and Parameterization Methods**
3 Credits Offered Spring Even-numbered Years
Construction of models from fundamental equations and the necessity of parametrizations. Simplification and discretization of equations, numerical methods, model-grids, analytical modeling, boundary and initial conditions, parametrizations and evaluation of model results. Scale-dependency, limitations of parametrizations and coupled modeling are elucidated. Students apply and code aspects of models themselves. ***Prerequisites: Graduate standing; calculus, physics or related F400-level basic computer skills. Recommended: ATM F601; basic knowledge in Fortran and UNIX/LINUX.*** (3+0)

ATM F688 **Atmospheric Science Informal Seminar**
1 Credit Offered Spring
Review of ongoing research in atmospheric science to learn about research results, ideas and direction long before they are published in journals. Presentations cover the broad range of atmospheric sciences and links to other disciplines as required to answer questions on global variability, climate change and assessment studies. Graded Pass/Fail. ***Prerequisites: Graduate standing in physical sciences or permission of instructor.*** (1+0)

AUTOMOTIVE

AUTO F080 **Driver and Safety Education**
2 Credits Offered as Demand Warrants
Driver education for the beginning driver. Alaska Driver's Manual, material necessary to gain an Alaska Driver's Permit. Defensive driving methods for accident- free driving and basic mechanical information. (2+0)

AUTO F081 **Behind-the-Wheel Training**
1 Credit Offered as Demand Warrants
Practical driver training in actual situations. Expected student outcome is obtaining a State of Alaska driver's license. ***Prerequisites: Must have a valid Alaska Driver's Permit.*** (0+3)

AUTO F100 **Introduction to Small Engine Repair**
1 Credit Offered as Demand Warrants
Parts and functions of a small engine and its electrical system. Dismantling procedures, cleaning and reassembly techniques, gasket-making, lubrication, troubleshooting, and minor repairs. (1+0)

AUTO F102 **Introduction to Automotive Technology**
3 Credits Offered as Demand Warrants
Provides career information in the automotive industry. Shop safety, hand tools, fasteners, fittings, and an introduction to the major automotive systems. Special fees apply. (2+2)

AUTO F106 **Auto/Diesel Engine Cooling and Climate Control Systems**
4 Credits Offered as Demand Warrants
Theory, diagnostics and repair of motor vehicle A/C, heating, engine cooling and automatic temperature control systems. Covers R-12 and R-143 refrigerant recovery, and related EPA regulations. Special fees apply. ***Recommended: AUTO F110.*** (3+3)

AUTO F110 **Basic Electrical Systems**
3 Credits Offered as Demand Warrants
The history and origins of electrical theory, the generation of electricity and diagnosis, minor repair and general servicing of alternators, starters and batteries. Special fees apply. (2+2)

AUTO F113 **Gasoline Fuel Delivery Systems**
4 Credits Offered as Demand Warrants
Basics of carburation and electronic fuel injection. Emphasis on theory, diagnostic/repair skills, inputs and outputs of the PCM, engine performance, use

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of on-board diagnostic data (OBD II) and special test equipment. Special fees apply. ***Recommended: AUTO F110.*** (2+2)

AUTO F122 Engine Theory and Diagnosis
3 Credits Offered as Demand Warrants
Introduction to fundamental aspects of engine design, general diagnosis and engine related service, to include combustion process, engine noise, basics of exhaust emissions, vacuum/pressure, compression, intake and exhaust systems, valve and ignition timing. Special fees apply. ***Prerequisites: AUTO F102 or instructor permission. Recommended: AUTO F110.*** (2+2)

AUTO F131 Automotive Electrical II
3 Credits Offered as Demand Warrants.
Theory, diagnosis and repair of automotive electrical/electronic systems to include testing tools, schematics and on-board computers. Special fees apply. ***Prerequisites: AUTO F110 or permission of instructor. Recommended: AUTO F102.*** (2+2)

AUTO F150 Brake Systems
4 Credits Offered as Demand Warrants
Theory, diagnosis and servicing of light- and heavy-duty vehicle hydraulic break and traction control systems. Includes discussion and tasks on disc brakes, drum brakes, power assist systems and anti-lock/traction controls. Special fees apply. ***Prerequisite: AUTO F110.*** (3+3)

AUTO F162 Suspension Alignment
4 Credits Offered as Demand Warrants
Theory, diagnosis and repair of suspension, steering and wheel alignment of automobiles and trucks. Special fees apply. (3+3)

AUTO F170 Snowmachine Maintenance and Repair
1 Credit Offered as Demand Warrants
Fundamental skills for operation and repair. Engine tune-up, lubrication, belt and track repair, alignment and basic problems encountered during operation. Graded Pass/Fail. Special fees apply. (1+0)

AUTO F172 All-Terrain Vehicle Maintenance and Repair
1 Credit Offered as Demand Warrants
Teaches fundamental skills for maintenance and repair of an All-Terrain Vehicle. Only one type of ATV will be the focus of the class, examples being: 4-wheelers, dirt bikes, hovercrafts. Engine tune-up, lubrication, clutch and belt, if applicable, transmission troubleshooting, tire and wheel repair, alignment and other basic problems encountered during operation along with safe shop procedures. Graded Pass/Fail. Graded Pass/Fail. (1+0)

AUTO F190 Automotive Practicum I
1-6 Credits Offered as Demand Warrants.
Provides supervised workplace experience in selected industry settings. Integrates knowledge and practice to achieve competencies in basic skills. A maximum of 6 credits may be earned. ***Prerequisites: Advisor approval required.*** (0+0+1-6)

AUTO F202 Auto Fuel and Emissions Systems
4 Credits Offered as Demand Warrants
Builds on the skills and knowledge gained in AUTO F122. Combustion chemistry, volumetric efficiency, design and function of emission control devices, laws and regulations concerning vehicle emissions are covered, with an emphasis on interfacing with on-board computers, automotive computer networking, and four and five gas analysis. Special fees apply. ***Prerequisites: AUTO F102; AUTO F122.*** (3+2)

AUTO F209 Automatic Transmissions and Transaxles
5 Credits Offered as Demand Warrants
Automatic transmissions and transaxles. Includes the operation, diagnosis and repair of planetary gears, clutches, pumps, hydraulic controls and electronic shifting controls. Study and hands-on tasks. Special fees apply. ***Recommended: AUTO F110 strongly recommended.*** (4+3)

AUTO F215 Engine Analyzer, Scopes and Scan Tools
4 Credits Offered as Demand Warrants
Use and interpretation of diagnostic analyzers for spark ignition engines, digital data, fault code and input/output information retrieval, scan tool usage and other diagnostic tools used in the vehicle repair industry. Special fees apply. ***Recommended: AUTO F110.*** (3+3)

AUTO F219 The Auto/Diesel Repair Business
2 Credits Offered as Demand Warrants
Overview of practices common in the vehicle repair industry. Includes flat rate, repair order write-up, customer relations, repair industry related OSHA and EPA regulations, and financing and acquiring a repair business. Special fees apply. (2+0)

AUTO F222 Automotive Engine Performance
3 Credits Offered as Demand Warrants
Builds on skills and knowledge gained in AUTO F122 and AUTO F202. Applies strategies for diagnosing fuel and ignition systems, automotive computers and multiplexing. Includes communication strategies, on-board diagnostics, testing and diagnosis of engine performance-related components. Special fees apply. ***Prerequisites: AUTO F122; AUTO F202; or permission of instructor.*** (2+2)

AUTO F227 Automotive Electrical III
3 Credits Offered as Demand Warrants
The theory, diagnosis and repair of automotive electrical and electronic systems to include accessories. Special fees apply. ***Prerequisites: AUTO F131.*** (2+2)

AVIATION TECHNOLOGY

AVTY F100 Private Pilot Ground School
4 Credits Offered as Demand Warrants
Study of aircraft and engine operation and limitations, aircraft flight instruments, navigation, navigation computers, national weather information and dissemination services. Federal aviation regulations, flight information publications, radio communications and navigation. Preparation for FAA private pilot-airplane written exam. Also available through the Center for Distance Education. (4+0)

AVTY F101 Private Pilot Flight Training
2 Credits Offered as Demand Warrants
Flight instruction is arranged by student through approved pilot school or independent flight instructor. Training will meet federal aviation regulations. Course completion requires awarding of private pilot certificate. ***Prerequisites: Department approval required.*** (2+0)

AVTY F102 Commercial Ground Instruction
3 Credits Offered as Demand Warrants
Advanced study of aircraft performance, airplane systems (including complex single engine, multi-engine and turboprop aircraft), navigation, regulations and meteorology. Employment considerations for commercial pilots surveyed. Preparation for the FAA commercial pilot-airplane written exam. (3+0)

AVTY F103 Commercial Flight Training
2 Credits Offered as Demand Warrants
Flight instruction is arranged by student through approved pilot school or independent flight instructor. Training will meet federal aviation regulations. Course completion requires awarding of commercial pilot certificate. ***Prerequisites: Private Pilot certificate, AVTY F102 or concurrent enrollment, or passing score on FAA Commercial Pilot written exam, department approval required.*** (2+0)

AVTY F105 Seaplane Flight Training
1 Credit Offered as Demand Warrants
Flight instruction is arranged by student through approved pilot school or independent flight instructor. Training will meet federal aviation regulations.

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Course completion requires awarding of single-engine sea rating. ***Prerequisites: Private pilot certificate or higher, department approval required.*** (1+0)

AVTY F107 Multi-Engine Flight Training
1 Credit Offered as Demand Warrants
Flight instruction is arranged by student through approved pilot school or independent flight instructor. Training will meet federal aviation regulations. Course completion requires awarding of multi-engine rating. ***Prerequisites: Private pilot certificate or higher, department approval required.*** (1+0)

AVTY F108 Introduction to Skis
1 Credit Offered as Demand Warrants
Pilot instruction with a certified flight instructor or flight school in techniques of ski-plane operation and cold weather maintenance. The student is responsible for making arrangements for an appropriate aircraft, instructor and financing. ***Prerequisites: Private pilot certificate.*** (1+0)

AVTY F109 Glider Flight Training
1 Credit Offered as Demand Warrants
Flight instruction is arranged by student through approved pilot school or independent flight instructor. Training will meet federal aviation regulations. Course completion requires awarding of glider and private or commercial pilot certificate with a glider category rating. ***Prerequisites: Department approval.*** (1+0)

AVTY F111 Fundamentals of Aviation
3 Credits
Basic concepts associated with the aircraft and its environment. Aircraft and its components, including basic systems, Federal Aviation Administration regulations, airports and airspace utilization, aeronautical charts, navigation, weather theory, medical and emergency factors. (3+0)

AVTY F116 Aviation History
3 Credits Offered as Demand Warrants
Aviation from its early days to the present. People, places and machines contributing to the development of Alaskan aviation. (3+0)

AVTY F121 Introduction to Aviation Safety
2 Credits Offered as Demand Warrants
An introduction to aviation safety designed to develop a positive attitude toward safety, refresh aeronautical knowledge and improve aeronautical skills. ***Prerequisites: Pilot's Certificate or enrollment in Aviation program. Proof required first day of class.*** (2+0)

AVTY F155 Preventive Maintenance
1-3 Credits Offered as Demand Warrants
Mechanics of the airplane, its powerplant and systems to enable the student to evaluate malfunctions and make maintenance decisions. Designed for the pilot-owner. Special fees apply. ***Prerequisites: Pilot's Certificate or enrollment in Aviation program. Proof required first day of class.*** (1-3+0)

AVTY F200 Instrument Ground School
4 Credits Offered as Demand Warrants
Instrument flight operations in detail, altitude instrument flying, air traffic control and navigation facilities, pilot responsibilities. IFR enroute charts, instrument approach procedures. Federal Aviation Regulations, flight planning, human factors and meteorology. Includes optional visits to FAA, RAPCO and ARTCC facilities. ***Prerequisites: Pilot's Certificate or enrollment in Aviation program. Proof required first day of class.*** (3+3)

AVTY F201 Instrument Pilot Training
2 Credits Offered as Demand Warrants
Flight instruction is arranged by student through approved pilot school or independent flight instructor. Cost of flight instruction varies with location of instruction. Training will be in accordance with current Federal Aviation Regulations. Course completion requires awarding of instrument rating. ***Prerequisites: Private or Commercial Pilot Certificate or AVTY F200 or concurrent enrollment or passing score on FAA Private or Commercial Pilot written exam, or permission of instructor; department approval.*** (2+0)

AVTY F202 Flight Instructor Ground School
3 Credits Offered as Demand Warrants
Preparation for the FAA certified flight instructor or advanced ground instructor written exam. ***Prerequisites: Commercial pilot certificate or permission of instructor.*** (3+0)

AVTY F203 Flight Instructor Flight Training
2 Credits Offered as Demand Warrants
Flight instruction is arranged by student through approved pilot school or independent flight instructor. Training meets federal aviation regulations. Course completion requires awarding of certified flight instructor certificate. ***Prerequisites: Commercial pilot certificate with instrument rating; AVTY F202; or concurrent enrollment; or passing score on FAA flight instructor written exams; department approval.*** (2+0)

AVTY F205 Instrument Instructor Flying
3 Credits Offered as Demand Warrants
Preparation for certification as an instrument flight instructor. ***Prerequisites: Commercial flight instructor certificate and department approval.*** (3+0)

AVTY F206 ATP Ground Instruction
4 Credits Offered as Demand Warrants
Preparation for the FAA airline transport pilot written exam. ***Prerequisites: Compliance with FAR 61.151 and 61.155 or department permission.*** (4+0)

AVTY F207 ATP Flying
2 Credits Offered as Demand Warrants
Qualification for single- or multi-engine FAA airline transport pilot certificate. ***Prerequisites: Commercial pilot certificate, 1500 hours of flight time as pilot or equivalent as described in FAR 61.155; AVTY F206 or passing score on FAA airline transport pilot written exam; current FAA first class medical certificate.*** (2+0)

AVTY F220 Basic Flight Physiology
3 Credits Offered as Demand Warrants
Understanding the physiology of flight and using this knowledge to explain why certain phenomena occur to the mind and body during flight. ***Prerequisites: Pilot's Certificate or enrollment in Aviation program. Proof required first day of class.*** (3+0)

AVTY F226 Flight Engineer Ground School
4 Credits Offered as Demand Warrants
A comprehensive examination of the major systems of one of the following aircraft: turbojet (B-727, DC-8, B-707); turboprop (L-382, L-188); or reciprocating (DC-6). Preparation for the FAA flight engineer written exam. ***Prerequisites: FAA commercial pilot license and instrument rating or equivalent; department approval.*** (4+0)

AVTY F231 Arctic Survival
3 Credits Offered as Demand Warrants
Use of principles, procedures, techniques and equipment to survive extreme arctic conditions and assist in safe recovery. Lab required. Special fees apply. Cross-listed with EMS F257. (3+0)

AVTY F232 Aviation Astronomy and Navigation
3 Credits Offered as Demand Warrants
Air navigation and astronomy, including charts, equipment, star and constellation identification, and calculations. (3+0)

AVTY F235 Elements of Weather
3 Credits Offered as Demand Warrants
Weather as it affects aircraft operators with an emphasis on interior Alaska. (3+0)

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AVTY F239 **Aircraft Dispatcher**
4 Credits Offered as Demand Warrants
Coordinating functions involving the aircraft and other departments of an airline business. Those wanting to be eligible for aircraft dispatcher certificate must be 23 years of age. (4+0)

AVTY F402 **Aircraft Management**
3 Credits Offered as Demand Warrants
Securing, dispatching and monitoring aircraft operations. Safety, security, community relations, cost-effective scheduling and personnel management for mission scheduling. (3+0)

AVTY F405 **Advanced Aircraft Operations**
3 Credits Offered as Demand Warrants
Techniques and requirements associated with the operation of turbine-powered aircraft, remotely piloted aircraft, helicopters and STOL aircraft for pilots and air workers; safety; systems; aerodynamics; operating characteristics. ***Prerequisites: AVTY F100 or AVTY F111 or AVTY F301 or permission of instructor.*** (3+0)

AVTY F410 **Techniques of Bush Flying**
2 Credits Offered as Demand Warrants
Flight training emphasizing emergency procedures in remote locations, off-airport operations, critical flight attitudes, low-level flight, terrain flying, special maneuvers and unique soft and short field takeoffs and landings. ***Prerequisites: AVTY F231; AVTY F235; AVTY F301; commercial rating; 20 hours taildragger time.*** (1+2)

BIOLOGY

BIOL F100X **Human Biology** (n)
4 Credits Offered Fall; As Demand Warrants
Introduction to scientific methodology and biological principles with a focus on humans as biological organisms. Topics include organization of the human body, human genetics, human development and the relationship between our bodies and health. Includes lecture, discussion, lab and projects. Offered through distance education. Offered at the Northwest campus as demand warrants. May not be used as biology elective credit for a major in biological sciences. Note: Intended for non-science majors and those seeking preliminary instruction before beginning study in health-related areas. Offered through Tanana Valley Campus and Rural campuses as demand warrants. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+3)

BIOL F103L **Biology and Society Laboratory**
1 Credit Offered Spring
A laboratory section only of BIOL 103X designed for transfer students that are non-science majors who have completed a natural science course with no laboratory at another institution. This lab cannot be used as a biology elective by biological science majors. Special fees apply. ***Prerequisites: A natural science course with no laboratory and permission of instructor.*** (0+3)

BIOL F103X **Biology and Society** (n)
4 Credits Offered Spring; Fall at Northwest Campus
Fundamental principles of biology; emphasis on their application to humans in the modern world. Lectures, laboratory demonstrations, experiments and discussions of contemporary biological topics. For non-science majors; cannot be used as a biology elective by biological science majors. Special fees apply. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+3)

BIOL F104 **Natural History of Alaska**
3 Credits Offered Fall
The physical environment peculiar to the North and important in determining the biological setting; major ecosystem concepts to develop an appreciation for land use and wildlife management problems in both terrestrial and aquatic situations. May not be used as biology elective credit for a major in biological science. Offered Spring and Fall via Independent Learning. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+0)

BIOL F104L **Natural History of Alaska Laboratory**
1 Credit Offered Fall
A laboratory section only of BIOL 104X designed for transfer students that are non-science majors who have completed a natural science course with no laboratory at another institution. This lab cannot be used as a biology elective by biological science majors. Special fees apply. ***Prerequisites: A natural science course with no laboratory and permission of instructor.*** (0+3)

BIOL F104X **Natural History of Alaska** (n)
4 Credits Offered Fall
The physical environment peculiar to the North and important in determining the biological setting; major ecosystem concepts to develop an appreciation for land use and wildlife management problems in both terrestrial and aquatic situations. May not be used as biology elective credit for a major in biological science. Special fees apply. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+3)

BIOL F111X **Human Anatomy and Physiology I** (n)
4 Credits Offered Fall
Integrated view of human structure and function for students in pre-professional allied health programs, biology, physical education, psychology and art. Covers cells, tissues and organs, skeletal and muscle systems, the nervous system, and integument. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor. Recommended: High school biology; High school algebra CHEM F105X-CHEM F106X or CHEM F103X-CHEM F104X.*** (3+3)

BIOL F112X **Human Anatomy and Physiology II** (n)
4 Credits Offered Spring
Integrated view of human structure and function for students in pre-professional allied health programs, biology, physical education, psychology and art. Examines circulatory, respiratory, digestive, excretory, endocrine and reproductive systems. Special fees apply. ***Prerequisites: BIOL F111X; placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor. Recommended: High school biology, high school algebra, CHEM F105X- CHEM F106X or CHEM F103X-CHEM F104X; ENGL F111X.*** (3+3)

BIOL F115X **Fundamentals of Biology I** (n)
4 Credits Offered Fall
Introduction to the principles of biology for science majors, with emphasis on chemistry of life, cell structure, metabolism, genetics and animal form and function. Students for whom this course is required for their major will be given preference when space is limited. Special fees apply. ***Prerequisites: Placement in ENGL F111X or higher; placement in MATH F107X or higher; or permission of instructor. Prerequisite/co-requisite: CHEM F105X or permission of instructor. Recommended: High school biology.*** (3+3)

BIOL F116X **Fundamentals of Biology II** (n)
4 Credits Offered Spring
Continuation of topics addressed in BIOL F115X, with emphasis on evolutionary biology, diversity of life, plant form and function and ecology. Students for whom this course is required for their major will be given preference when space is limited. Special fees apply. ***Prerequisite: BIOL F115X.*** (3+3)

BIOL F135 **The Third Kingdom: Mushrooms and other Fungi**
3 Credits Offered Fall Even-numbered Years
Introduction to fungi of the world with an emphasis on Alaska arctic, subarctic and subantarctic environs. Designed to encourage more in-depth study, but is primarily for traditionally non-science orientations. Form, function, symbiosis, taxa, social, industrial and technological applications are emphasized. (3+0)

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BIOL F150 Introduction to Marine Biology
3 Credits
Survey of marine organisms, evolution of marine life, habitats and communities of ocean zones, productivity and marine resources. For non-science majors; may not be used as biology elective credit for a major in biological science. Available via Independent Learning only. (3+0)

BIOL F233 Biology of the Non-Vascular Plants
3 Credits Offered as Demand Warrants
Structure, function, comparative development, taxonomy, phylogeny and life histories of non-vascular cryptogams (blue-green algae, algae, fungi, lichens, mosses, liverworts and horn worts). Special fees apply. ***Prerequisites: BIOL F115X; BIOL F116X.*** (2+3)

BIOL F239 Introduction to Plant Biology (n)
4 Credits Offered Fall
Plant biology including plant form and function (morphology, physiology and development), ecology (including interactions with herbivores, pollinators and microbes), conservation, evolution and economic botany. Emphasis on vascular plants (particularly angiosperms) but includes comparisons with nonvascular plants. ***Prerequisites: BIOL F115X; BIOL F116X.*** (3+3)

BIOL F240 Beginnings in Microbiology
4 Credits Offered as Demand Warrants
Fundamentals of microbiology. Survey of the microbial world, interactions between microbes and host, microbial human diseases, the environmental and economic impact of microorganisms. Provides background in basic and applied microbiology with emphasis on the role microorganisms play in human health and life. Offered at Tanana Valley Campus. Special fees apply. ***Prerequisites: One course in high school or college-level biology required, or permission of the instructor. Recommended: One course in chemistry. Note: May not be used as biology elective credit for a major in biological sciences.*** (3+3)

BIOL F261 Introduction to Cell and Molecular Biology (n)
4 Credits
An introduction to the structure and function of cells. Topics include: the structure and function of cellular components, including proteins, membranes and organelles; understanding how cells communicate; and how information is processed in the cell via DNA replication, transcription and translation. Special fees apply. ***Prerequisites: BIOL F115X; BIOL F116X; CHEM F105X; CHEM F106X or concurrent enrollment.*** Cross-listed with CHEM F261. (3+3)

BIOL F271 Principles of Ecology (n)
4 Credits
Basic principles in physiological, ecosystem, population and community ecology. Environmental factors and their influence on plants and animals. Structure, growth and regulation of populations. The ecosystem concept, biogeochemical cycles, and the structure and function of major terrestrial biomes. Special fees apply. ***Prerequisites: BIOL F115X; BIOL F116X; LS F100 or LS F101 or successful completion of library skills competency test; or permission of instructor.*** (3+3)

BIOL F277 Introduction to Conservation Biology
3 Credits Offered Spring
Introduction to the basic ecological, genetic, management, legal and historical developments in conservation biology, and focused efforts to manage biological diversity resources, with a status review of important habitats and endangered species. ***Prerequisites: BIOL F115X, BIOL F116X.*** Cross-listed with NRM F277. (3+0)

BIOL F288 Marine and Freshwater Fishes of Alaska
3 Credits Offered Spring Even-numbered Years
Biology of the marine and freshwater fishes of Alaska including their evolutionary relationships, biogeography, life-history, ecology, behavior and importance to people. ***Prerequisites: FISH F101 or permission of instructor.*** Cross-listed with FISH F288. (3+0)

BIOL F303 Principles of Metabolism and Biochemistry
4 Credits Offered Fall
Introduction to metabolism at the molecular level. Topics include structure and function of proteins, allostery and feedback, biological regulation and the major pathways of carbon and nitrogen metabolism. Presented in an evolutionary and ecological context. ***Prerequisites: BIOL F115X; BIOL F116X; CHEM F105X; CHEM F106X.*** (3+3)

BIOL F305 Invertebrate Zoology (n)
4 Credits Offered Spring Even-numbered Years
Classification, structure, function, evolution and life histories of invertebrate animals. Special fees apply. ***Prerequisites: BIOL F115X; BIOL F116X; BIOL F271.*** (3+3)

BIOL F310 Animal Physiology (n)
4 Credits Offered Fall
Animal function, including respiration, digestion, circulation, nerve and muscle function, hormones and reproduction. Special fees apply. ***Prerequisites: BIOL F115X; BIOL F116X; CHEM F105X; CHEM 106X.*** (3+3)

BIOL F317 Comparative Anatomy of Vertebrates (n)
4 Credits Offered Spring
Anatomy, phylogeny and evolution of the vertebrates. Special fees apply. ***Prerequisites: BIOL F115X; BIOL F116X.*** (2+6)

BIOL F328 O Biology of Marine Organisms
3 Credits Offered Spring
Marine organisms: ocean as a habitat, distribution, classification, functional morphology, and general biology of the major biological groups; man and the oceans. ***Prerequisites: COMM F131X or COMM F141X; upper-division standing in a biologically oriented major.*** (3+0)

BIOL F331 Systematic Botany (n)
4 Credits Offered Spring
Classification of flowering plants with emphasis on Alaskan flora; taxonomic principles, classical and experimental methods of research. Preregistration is required to ensure that each student will prepare a plant collection. Special fees apply. ***Prerequisites: BIOL F239 or permission of instructor. Recommended: BIOL F362.*** (2+6)

BIOL F334 W Structure and Function in Vascular Plants (n)
4 Credits Offered Spring Odd-numbered Years
Morphology, anatomy and physiology of vascular plants, stressing the interrelationships between development, anatomy, growth, water relations, photosynthesis, transport and metabolism. ***Prerequisites: BIOL F239; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** (3+3)

BIOL F342 Microbiology (n)
4 Credits Offered Spring
Morphology and physiology of microorganisms. The role of these organisms in the environment and their relationship to humans. Concepts of immunology. Laboratory stresses aseptic techniques for handling microorganisms. Special fees apply. ***Prerequisites: BIOL F115X; BIOL F116X; CHEM F105X.*** (3+3)

BIOL F362 Principles of Genetics (n)
4 Credits
Principles of inheritance; physiochemical properties of genetic systems. Special fees apply. ***Prerequisites: BIOL F115X; BIOL F116X; CHEM F105X; MATH F107X or higher.*** (3+3)

BIOL F402 W Biomedical and Research Ethics (h)
3 Credits Offered Fall
Issues in biomedical ethics. Topics will vary but include discussion of moral principles and problems of research ethics and medical ethics, such as: animal and human experimentation; data management; informed consent; therapeutic and non-therapeutic research; physician/patient relationship; autonomy; assisted reproductive technologies; euthanasia; organ transplantation; and allocation of scarce medical resources. ***Prerequisites: ENGL F111X; either***

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ENGL F211X or ENGL F213X; junior or senior standing; a course in philosophy, science, or nursing; permission of instructor. Recommended: A course in philosophy, science or nursing. Cross-listed with PHIL F402. (3+0)

BIOL F406 **Entomology** (n)
4 Credits Offered Spring Odd-numbered Years
Biology of insects and related arthropods, with emphasis on evolution, ecology, behavior, biodiversity, morphology and systematics. Lab emphasizes identification and collection. ***Prerequisites: BIOL F115X; BIOL F116X; BIOL F271; or permission of instructor.*** (3+3)

BIOL F417 O **Neurobiology**
3 Credits Offered Spring Even-numbered Years
Organization and function of the vertebrate nervous system from the subcellular to the organismal levels. Neural bases of sensations, specific behaviors and homeostasis. Applications of basic neurobiological research to pathological conditions. Examples taken mostly from the recent vertebrate literature. ***Prerequisites: BIOL F310; COMM F131X or COMM F141X; or permission of instructor.*** Stacked with BIOL F617. (3+0)

BIOL F422 **Physiological Ecology of Overwintering**
3 Credits Offered as Demand Warrants
Investigation of physiological and behavioral responses of animals and plants to winter in northern environments. Analysis of biologically relevant environmental changes that accompany winter, and comparison of alternative strategies that organisms use to cope with winter including: photoperiodism, acclimatization, arctic endurance, migration, hibernation, supercooling and freeze tolerance. Includes principles of thermoregulation, conductance and fattening. Includes field studies of overwintering of insects and amphibians. ***Prerequisites: BIOL F310 or permission of instructor.*** Stacked with BIOL F623. (2+3)

BIOL F425 **Mammalogy** (n)
3 Credits Offered Fall
Variety of mammals, their behavior, life histories, identification, phylogeny and systematics, morphology, distribution and zoogeography. ***Prerequisites: BIOL F317 or permission of instructor; junior standing or above.*** (2+3)

BIOL F426 W,O/2 **Ornithology** (n)
3 Credits Offered Spring
Evolution, anatomy, physiology, distribution, migration, breeding biology of birds, their classification and identification. ***Prerequisites: BIOL F115X; BIOL F116X; COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (2+3)

BIOL F427 **Ichthyology** (n)
4 Credits Offered Spring
Major groups of fishes, emphasizing fishes of northwestern North America. Classification structure, evolution, general biology and importance to man. Cross-listed with FISH F427. (3+3)

BIOL F433 **Conservation Genetics**
3 Credits Offered Spring
Concepts of population genetics, phylogenetics, pedigree analysis, systematics and taxonomy as they apply to conservation of species. Evaluating the impact of small population size, population fragmentation, inbreeding, hybridization, taxonomic uncertainties and other factors on viability and management of species. ***Prerequisites: BIOL F271 or equivalent; BIOL F362 or equivalent; or permission of instructor. Recommended: BIOL F277; NRM F277.*** Cross-listed with WLF F433. Stacked with BIOL F633; WLF F633. (3+0)

BIOL F441 W,O/2 **Animal Behavior** (n)
3 Credits Offered Fall
Genetic and physiological bases of behavior, evolutionary and ecological principles of individual and social behavior, sociobiology and techniques of behavioral observation and analysis. ***Prerequisites: BIOL F271; BIOL F310; COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (2+3)

BIOL F443 W **Microbial Ecology**
3 Credits Offered Fall Odd-numbered Years
Interactions of microorganisms with their environment, emphasizing microbial responses to the environment, microbial processes such as nutrient cycling and pollutant biodegradation, and microbial interactions with each other, plants and animals. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; BIOL F271 or BIOL F342; or permission of instructor.*** (3+0)

BIOL F445 W,O **Molecular Ecology and Evolution** (s)
3 Credits Offered Fall Odd-numbered Years
An introduction to theory and computational techniques used to analyze and interpret DNA sequence variation among populations and closely related species. Special fees apply. ***Prerequisites: BIOL F362; BIOL F481.*** Stacked with BIOL F645. (2+3)

BIOL F450 W,O **Women and Science**
3 Credits Offered Spring Odd-numbered Years
The historical contributions and participation of women in science with an emphasis on the biological sciences. Discussion of the factors affecting female participation in the sciences and how participation of women in science affects the manner in which science is concluded. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; junior standing in the natural sciences; or permission of instructor.*** (3+0)

BIOL F453 O/2 **Molecular Biology**
4 Credits Offered Fall Even-numbered Years
Provides in-depth coverage of eukaryotic and prokaryotic gene function, including the applications of recombinant DNA technology to the biological sciences. ***Prerequisites: BIOL F362 or CHEM F321 or BIOL F303; COMM F131X or COMM F141X; or permission of instructor.*** Cross-listed with CHEM F453. Stacked with BIOL F653; CHEM F653. (3+3)

BIOL F455 W,O **Environmental Toxicology**
3 Credits Offered Spring Even-numbered Years
Environmental toxicology will focus on the general properties and principles of persistent and/or poisonous (toxic) chemicals commonly encountered in air, water, fish and wildlife. Numerous natural and synthetic chemicals in the environment will be discussed from a global perspective with some bias towards arctic and subarctic regions. Special fees apply. ***Prerequisites: CHEM F451 or BIOL F303; or one semester each of organic chemistry and cell or molecular biology; or permission of instructor.*** Cross-listed with CHEM F455. (0+0)

BIOL F458 **Vertebrate Endocrinology**
3 Credits Offered Fall Odd-numbered Years
Introduction to the mechanisms of action and the roles of the main hormonal systems that operate in vertebrates. Hormone effects at the organ, tissue and (sub)cellular levels. Hormonal control of homeostasis and of specific behaviors. Examples to be taken mostly from recent comparative studies. ***Prerequisites: BIOL F310 or permission of instructor.*** Cross-listed with WLF F458. (3+0)

BIOL F459 O/2 **Wildlife Nutrition**
4 Credits Offered Fall
The energy nutrient requirements of vertebrate animals in relation to their ecology, physiology and life history. Concepts and techniques used by wildlife biologists to understand relationships between wild animals and their habitats. Techniques for constructing energy and nutrient budgets of wild animals and applications of these budgets to population-level processes and habitat management. ***Prerequisites: COMM F131X or COMM F141X; BIOL F310; BIOL F271; or permission of instructor.*** Cross-listed with WLF F460. Stacked with BIOL F659; WLF F660. (3+3)

BIOL F462 O **Concepts of Infectious Disease**
3 Credits Offered Spring
Covers infectious disease biology using examples of different pathogens and exploring the concepts of their biology and the implication of these principles on pathology, epidemiology and sociology of infectious diseases. ***Prerequisites:***

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BIOL F261 or BIOL F342; or permission of instructor. Stacked with BIOL F662. (3+0)

BIOL F465 **Immunology**
3 Credits Offered Spring Odd-numbered Years
Adaptive immune response including its components and activation from cells to molecules, clonal selection, antigen recognition, and discrimination between foreign and self. Concepts applied on the level of intact organisms addressing allergies, autoimmunity, transplantation, tumors and disease (AIDS). ***Prerequisites: BIOL F115X and BIOL F116X and BIOL F310; or BIOL F111X and BIOL F112X; or permission of instructor.*** (3+0)

BIOL F467 **Ecosystems of Alaska** (n)
3 Credits Offered Summer Even-numbered Years; As Demand Warrants
Focus on the application of ecological principles to field research. Emphasis on the integration of ecology with climatology, geology and hydrology to understand the functioning of ecosystems at local and regional scales. One week of intensive lecture and library research followed by 10 days of field research in the major ecosystems of Alaska. Special fees apply. ***Prerequisites: An undergraduate course in ecology, geology, hydrology or climatology and permission of instructor.*** (2+3)

BIOL F469 O **Landscape Ecology and Wildlife Habitat**
3 Credits Offered Spring
A problem-based learning and critical thinking approach to modern methods in landscape ecology, including geographic information systems, remote sensing, modeling, software and the Internet. Graduate students are expected to help undergraduates with occurring problems and questions. Special fees apply. ***Prerequisites: BIOL F271 or equivalent; COMM F131X or COMM F141X.*** Cross-listed with WLF F469. Stacked with BIOL F669; WLF F669. (2+3)

BIOL F471 **Population Ecology** (n)
3 Credits Offered Spring
Biology of populations of plants and animals, including population structure, natality, mortality, population growth, regulation of population size, population interactions in competition, herbivory, predation and parasitism. ***Prerequisites: A calculus course, BIOL F271 for biology majors; WLF F201 for wildlife majors; either course for others.*** (2+3)

BIOL F472 W **Community Ecology** (n)
3 Credits Offered Fall Even-numbered Years
Structure of plant and animal communities and their organization. Structuring forces of competition, predation, herbivory, mutualisms, and the flow of energy and nutrients. Latitudinal gradients in species richness and biogeography. ***Prerequisites: BIOL F271; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** (2+3)

BIOL F473 W **Limnology**
4 Credits Offered Fall
The ecology of inland waters emphasizing lakes and rivers. Lecture provides graphically oriented view of concepts. Workshops provide role-playing exercises for integrating social, economic and ecological aspects of managing freshwater systems. Laboratory involves team- based original research from proposal to manuscript. Special fees apply. ***Prerequisites: BIOL F115X; BIOL F116X; BIOL F271; CHEM F105X; CHEM F106X; ENGL F111X; ENGL F211X or F213X or permission of instructor.*** (2+3+2)

BIOL F474 **Plant Ecology** (n)
4 Credits Offered Spring Even-numbered Years
Principles and contemporary topics in plant ecology. Autoecology, community ecology, ecosystem ecology and evolutionary ecology. ***Prerequisites: BIOL F239, BIOL F271, STAT F200X.*** (3+3)

BIOL F475 **Vegetation Description and Analysis**
2 Credits Offered Fall Even-numbered Years
Methods of vegetation science including sampling, classification, gradient analysis, ordination, field description and mapping. Field trips to the plant communities of interior Alaska. Special fees apply. ***Prerequisites: BIOL F474 or other general ecology course; permission of instructor.*** (1+3)

BIOL F476 **Ecosystem Ecology**
3 Credits Offered Fall Odd-numbered Years
Focus on the biological and physical principles that govern functioning of terrestrial ecosystems. Emphasis on how plants, animals and microorganisms control the movement of water, carbon and nutrients through ecosystems. Discussion of how changes in these processes have altered global cycles of carbon, water and nutrients and sustainability of the world's ecosystems. ***Prerequisites: BIOL F271 or BIOL F239 or permission of instructor.*** (3+0)

BIOL F481 **Principles of Evolution**
4 Credits
Patterns and processes of evolutionary change are used to explore the unifying principles of the biological sciences. Basic models of population genetics, quantitative genetics, development, phylogenetics and systematics are used to build a conceptual framework for study of living systems. Special fees apply. ***Prerequisites: BIOL F271; BIOL F362; STAT F200X; junior standing; or permission of instructor. Note: STAT F200X may be taken concurrently.*** Stacked with BIOL F681. (3+3)

BIOL F483 **Stream Ecology**
3 Credits Offered Spring
The ecology of streams and rivers focusing on physical, chemical and biological processes. ***Prerequisites: BIOL F115X; BIOL F116X; BIOL F271. Recommended: CHEM F105X; CHEM F106X.*** (3+0)

BIOL F485 **Global Change Biology**
3 Credits Offered Fall Odd-numbered Years
Contemporary science and policy concerns of global change that involve biological processes. Includes structural and functional responses and sensitivities of biological processes to environmental changes (such as climate and human uses of land and biological resources); implications of biological responses to global change for conservation and management of biological resources; and the social and economic consequences of biological responses to global change. ***Prerequisites: BIOL F271; CHEM F105X; CHEM F106X.*** Cross-listed with WLF F485. (3+0)

BIOL F486 **Vertebrate Paleontology** (n)
3 Credits Offered Spring Odd-numbered Years
The study of vertebrate evolution through geologic time. Covers the temporal range, diversity and systematics of major vertebrate groups as documented in the fossil record, with an emphasis on current problems in vertebrate evolutionary pattern and process. Labs emphasize comparative morphology and identification of major vertebrate groups. ***Prerequisites: BIOL F310; or BIOL F317; or GEOS F315; or permission of instructor.*** Cross-listed with GEOS F486. Stacked with GEOS F686; BIOL F686. (2+3)

BIOL F487 **Conceptual Issues in Evolutionary Biology**
3 Credits Offered Spring Odd-numbered Years
Analysis of some of the main models which explain evolutionary change, followed by consideration of the practical implications these models have on the study of biological phenomena in general. Cross-listed with PHIL F487. Stacked with BIOL F687; PHIL F687. (3+0)

BIOL F602 **Research Design**
3 Credits Offered Fall
An introduction to the philosophy, performance and evaluation of hypothetical/deductive research in the biological sciences, with emphasis on hypothesis formulation and testing. Each student will develop a research proposal. ***Prerequisite: Graduate standing or permission of instructor.*** Cross-listed with WLF F602. (3+0)

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BIOL F604 **Scientific Writing, Editing, and Revising in the Biological Sciences**
3 Credits Offered Spring
For students who are ready to produce a manuscript or thesis chapter. Topics include the publishing process (e.g., the role of editors and reviewers), preparing to write (selecting a journal, authorship), the components of the scientific paper, revising and editing manuscripts, and responding to reviews. Students will produce a complete manuscript. ***Prerequisites: Graduate standing in Biology or related discipline and permission of instructor.*** (3+0)

BIOL F605 **Animal Stable Isotope Ecology**
3 Credits Offered Spring Odd-numbered Years
Recent primary literature in stable isotope ecology, which uses naturally occurring variation in stable isotopes of carbon, nitrogen, oxygen, hydrogen and sulphur as markers of organismal and ecological processes. The focus will be on animal studies, including diet reconstruction, mixing models, food web, metabolism, nutrient allocation and migration. ***Prerequisite: Graduate standing; or permission of instructor.*** (3+0)

BIOL F611 **Fish Physiology**
3 Credits Offered in Juneau, As Demand Warrants
Physiology of the living fishes. ***Prerequisites: BIOL F310 [BIOL S310-J]; BIOL F427.*** (3+0)

BIOL F613 **Resilience Internship**
2 Credits Offered Fall
Students of the Resilience and Adaptation Program participate in internships to broaden their interdisciplinary training, develop new research tools, and build expertise outside their home disciplines. Internships are for eight to ten weeks of full time commitment and take place during the student's first summer in the program. In the autumn students meet to discuss their internship experiences and make public presentations. ***Prerequisites: ANTH/BIOL/ECON/NRM F667; ANTH/BIOL/ECON/NRM F668; or permission of instructor.*** Cross-listed with ANTH F617; ECON F613; NRM F613. (2+0)

BIOL F614 **Foraging Ecology**
2 Credits Offered Fall Even-numbered Years
The dynamics of herbivory, emphasizing the foraging process, and including mechanisms of feeding, feeding behavior, habitat and plant selection, physiological influences on feeding, plant and community level responses, plant defenses against herbivory and management of plant-herbivore systems. ***Prerequisites: Graduate standing or approval of instructor.*** Cross-listed with WLF F614. (2+0)

BIOL F615 **Systematic and Comparative Biology**
3 Credits Offered Fall Even-numbered Years
Concepts of systematic biology basic to a rigorous and complete understanding of modern evolutionary theory. Systematics provides the historical framework critical to a variety of comparative analyses in biology. Recent innovations in phylogenetic analyses will be explored. ***Prerequisites: Graduate standing in biology or permission of instructor.*** (3+0)

BIOL F616 **Ecological Background for Resilience and Adaptation**
1 Credit Offered Fall
Provides the ecological background that is necessary for understanding the role of ecology in complex systems involving interactions among biological, economic, and social processes. Designed for incoming students of the Resilience and Adaptation Program (RAP), who have not received training in ecology. ***Prerequisites: Graduate student enrollment or permission of instructor.*** Cross-listed with NRM F616. (1+0)

BIOL F617 **Neurobiology**
3 Credits Offered Spring Even-numbered Years
Organization and function of the vertebrate nervous system from the subcellular to organismal levels. Neural bases of sensations, specific behaviors and homeostasis. Applications of basic neurobiological research to pathological conditions. Examples taken mostly from the recent vertebrate literature. ***Prerequisites: BIOL F310 and graduate standing; or permission of instructor.*** Stacked with BIOL F417. (3+0)

BIOL F618 **Biogeography**
3 Credits Offered Spring
Spatial and temporal geography of plant and animal groups; emphasis on environmental and historical features controlling present patterns of distribution. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

BIOL F622 **Current Issues in Conservation Biology**
3 Credits Offered Spring Odd-numbered Years
Critical discussion of contemporary issues concerning extinction patterns, population viability and the preservation, design and management of habitats for populations/species of concern. Stresses integration of principles and policies into strategies for biological conservation. ***Prerequisites: Graduate standing; BIOL F471 or WLF F410; or permission of instructor.*** Cross-listed with WLF F622. (3+0)

BIOL F623 **Physiological Ecology of Overwintering**
3 Credits Offered as Demand Warrants
Investigation of physiological and behavioral responses of animals and plants to winter in northern environments. Analysis of biologically relevant environmental changes that accompany winter, and comparison of alternative strategies that organisms use to cope with winter including: photoperiodism, acclimatization, arctic endurance, migration, hibernation, supercooling and freeze tolerance. Includes principles of thermoregulation, conductance and fattening. Includes field studies of overwintering of insects and amphibians. ***Prerequisites: BIOL F310 or permission of instructor.*** Stacked with BIOL F422. (2+3)

BIOL F629 **Advanced Animal Behavior**
3 Credits Offered Fall Even-numbered Years
Adaptive nature of behavior in relation to the physical, biological and social environment. Focus on mechanistic (endocrinological and molecular) approaches to studying behavior. ***Prerequisites: BIOL F441 and graduate standing; or permission of instructor.*** (3+0)

BIOL F633 **Conservation Genetics**
3 Credits Offered Spring
Concepts of population genetics, phylogenetics, pedigree analysis, systematics and taxonomy as they apply to conservation of species. Evaluating the impact of small population size, population fragmentation, inbreeding, hybridization, taxonomic uncertainties and other factors on viability and management of species. ***Prerequisites: BIOL F271 and BIOL F362 or equivalent or permission of instructor. Recommended: BIOL F277; NRM F277.*** Cross-listed with WLF F633. Stacked with BIOL F433; WLF F433. (3+0)

BIOL F644 **Advanced Topics in Evolution**
3 Credits Offered Spring
Modern theory and subdisciplinary directions in the expanding field of evolutionary biology. Topics include adaptation, speciation, reinforcement, comparative method, group selection, phylogeography, advanced systematics, geographic variation and the role of evolutionary biology in society. May be repeated for credit when content varies. ***Prerequisites: Undergraduate course in evolution or permission of instructor.*** (3+0)

BIOL F645 W,O **Molecular Ecology and Evolution** (s)
3 Credits Offered Fall Odd-numbered Years
An introduction to theory and computational techniques used to analyze and interpret DNA sequence variation among populations and closely related species. Special fees apply. ***Prerequisites: BIOL F362; BIOL F481; graduate standing or permission of instructor.*** Stacked with BIOL F445. (2+3)

BIOL F647 **Global to Local Sustainability**
3 Credits Offered Fall
Explores basic principles that govern resilience and change of ecological and social systems. Principles are applied across a range of scales from local communities to the globe. Working within and across each of these scales, students

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address the processes that influence ecological, cultural and economic sustainability, with an emphasis on northern examples. ***Prerequisites: Graduate standing in a natural science, social science, humanities, or interdisciplinary program at UAF; and permission of instructor.*** Cross-listed with ANTH F647; ECON F647; NRM F647. (3+0)

BIOL F649 **Integrated Assessment and Adaptive Management**
3 Credits Offered Spring
Interdisciplinary exploration of the theoretical and practical considerations of integrated assessment and adaptive management. Students survey concepts important in understanding societal and professional-level decision-making. Students work as individuals and as a team to undertake case studies with relevance to integrated assessment and adaptive management. The class builds a portfolio of cases and conducts an integrated assessment. Note: In case of enrollment limit, priority will be given to graduate students in the Resilience and Adaptation Program in order for them to be able to meet their core requirements. ***Prerequisites: Graduate student standing in a natural science, social science, humanities or interdisciplinary program at UAF or another university; or permission of instructor. The course is designed to fit into the sequence of Resilience and Adaptation Program's core courses. It is open to other graduate students interested in and prepared to conduct interdisciplinary studies relating to sustainability. Recommended: ANTH/BIOL/ECON/NRM F647; ANTH/BIOL/ECON/NRM F667. In case of enrollment limits, priority will be given to graduate students in the Resilience and Adaptation program in order for them to be able to meet their core requirement.*** Cross-listed with ANTH F649; ECON F649; NRM F649. (3+0)

BIOL F650 **Fish Ecology**
3 Credits Offered Fall Odd-numbered Years
The ecology of fish is examined from the community aspect. Current literature on inter- and intraspecific relationships, influence of the environment on community structure, behavior and production is emphasized. ***Prerequisites: BIOL F473 [BIOL S423-J]; FISH F400.*** Cross-listed with FISH F650. (2+3)

BIOL F653 **Molecular Biology**
4 Credits Offered Fall Odd-numbered Years
In-depth coverage of eukaryotic and prokaryotic gene function, including the applications of recombinant DNA technology to the biological sciences. ***Prerequisites: Graduate standing; BIOL F303 or BIOL F362 or CHEM F321; or permission of instructor.*** Cross-listed with CHEM F653. Stacked with BIOL F453; CHEM F453. (3+3)

BIOL F656 **Environmental Toxicology**
3 Credits Offered Spring Even-numbered Years
Environmental toxicology will focus on the general properties and principles of persistent and/or poisonous (toxic) chemicals commonly encountered in air, water, fish and wildlife. Numerous natural and synthetic chemicals in the environment will be discussed from a global perspective with some bias towards arctic and subarctic regions. Special fees apply. ***Prerequisites: CHEM F451; BIOL F303; or one semester each of organic chemistry and cell or molecular biology or permission of instructor.*** Cross-listed with BIOL F655. Stacked with BIOL F455; CHEM F455. (3+0)

BIOL F659 **Wildlife Nutrition**
4 Credits Offered Fall
The energy nutrient requirements of vertebrate animals in relation to their ecology, physiology and life history. Concepts and techniques used by wildlife biologists to understand relationships between wild animals and their habitats. Techniques for constructing energy and nutrient budgets of wild animals and applications of these budgets to population-level processes and habitat management. Special fees apply. ***Prerequisites: BIOL F310; BIOL F271; graduate standing; or permission of instructor.*** Cross-listed with WLF F660. Stacked with BIOL F459; WLF F460. (3+3)

BIOL F662 **Concepts of Infectious Disease**
3 Credits Offered Spring
Covers infectious disease biology using examples of different pathogens and exploring the concepts of their biology and the implication of these principles on pathology, epidemiology and sociology of infectious diseases. ***Prerequisites: Graduate standing; BIOL F261 or BIOL F342; or permission of instructor.*** Stacked with BIOL F462. (3+0)

BIOL F665 **Aquatic Entomology**
2 Credits Offered Fall
Aquatic invertebrate taxonomy, mostly to the family level, and ecology. Includes field trips to learn collecting techniques and habitats. ***Prerequisites: Graduate standing or permission of instructor; students must be able to safely wade in streams and wetlands.*** Cross-listed with FISH F665. (1+3)

BIOL F667 **Resilience Seminar I**
1 Credit Offered Fall
Provides a forum for new students of the Resilience and Adaptation graduate program to explore issues of interdisciplinary research that are relevant to sustainability. A considerable portion of the seminar is student-directed, with students assuming leadership in planning seminar activities with the instructor. Graded Pass/Fail. ***Prerequisites: Student must be enrolled in Resilience and Adaptation graduate program or permission of instructor. Recommended: ANTH/BIOL/ECON/NRM F647 (taken concurrently).*** Cross-listed with ANTH F667; ECON F667; NRM F667. (2+0)

BIOL F668 **Resilience Seminar II**
1 Credit Offered Spring
Provides a forum for new students of the Resilience and Adaptation graduate program to explore issues of interdisciplinary research that are relevant to sustainability. The seminar provides support to each student planning his/her summer internship and preparing and presenting a thesis research prospectus. Graded Pass/Fail. ***Prerequisites: ANTH/BIOL/ECON/NRM F647; ANTH/BIOL/ECON/NRM F667; or permission of instructor.*** Cross-listed with ANTH F668; ECON F668; NRM F668. (2+0)

BIOL F669 **Landscape Ecology and Wildlife Habitat**
3 Credits Offered Spring
A problem based learning and critical thinking approach to modern methods in landscape ecology, including geographic information systems, remote sensing, modeling, software and the Internet. Graduate students are expected to help undergraduates with occurring problems and questions. Special fees apply. ***Prerequisites: Graduate standing.*** Cross-listed with WLF F669. Stacked with BIOL F469; WLF F469. (2+3)

BIOL F672 **Ecosystem Processes**
3 Credits Offered Fall Odd-numbered Years
A comparative approach to the structural and functional components of terrestrial ecosystems, emphasizing primary and secondary production and the dynamics of nutrient cycling processes. Interactions between producers, consumers and decomposition processes, and effects on the efficiencies of nutrient and energy transfers. ***Prerequisites: Graduate standing or permission of instructor.*** (2+2)

BIOL F675 **Plant Physiological Ecology**
3 Credits Offered Fall Even-numbered Years
Physiological ecology of dormancy, germination, growth, photosynthesis, water relations and nutrition with an emphasis on northern and other stressful environments; relationship to community and ecosystem processes. ***Prerequisites: Graduate standing; BIOL F239; BIOL F334; BIOL F474; or permission of instructor.*** Cross-listed with ECON F675. (2+3)

BIOL F676 **Interdisciplinary Modeling of High Latitude Global Change**
4 Credits Offered Fall Even-numbered Years
Introduces students to approaches to modeling how regional and global environmental change influences biological and social systems in high latitudes and how the responses of these systems influence the regional and global functioning of the earth system. ***Prerequisites: STAT F200X or equivalent; graduate standing; or permission of instructor.*** Cross-listed with NRM F676. (3+3)

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BIOL F677 **Advanced Topics in Plant Ecology and Systematics**
3 Credits Offered Spring
One of four topics is covered each year: 1) Current issues and concepts in plant population and community ecology. 2) Reproductive ecology — pollination, seed dispersal, breeding systems and coevolution. 3) Plant families of the world. 4) Plant-animal interactions — evolution and ecology. Note: May be repeated for credit when topic differs. ***Prerequisites: BIOL F474; graduate standing; or permission of instructor.*** (3+0)

BIOL F679 **Cellular and Molecular Neuroscience**
3 Credits Offered Fall
This 3 credit course is team-taught by neuroscience faculty in Chemistry and Biology. The course goal is to provide a comprehensive overview of the molecular and cellular aspects of the adult and developing nervous system in vertebrates, particularly humans. Topics addressed will include neuroanatomy, electrophysiology and synaptic transmission, cellular neuroscience, neuropharmacology, and neurodevelopment. ***Prerequisites: Two F300-level courses in BIOL or CHEM or PSY F345 or permission of instructor.*** Cross-listed with CHEM F470; CHEM F670. (3+0)

BIOL F680 **Data Analysis in Biology**
3 Credits Offered Fall Even-numbered Years
Biological applications of nonparametric statistics, including tests based on binomial and Poisson distributions, analysis of two-way and multiway contingency tables, and tests based on ranks; multivariate statistics, including principal component analysis, ordination techniques, cluster analysis, and discriminate analysis; and time-series analysis. Introduction to the use of the computer and use of statistical packages. Each student will analyze a data set appropriate to the student's research interests. ***Prerequisites: STAT F200X; STAT F401; either graduate standing in a biologically oriented field; or permission of instructor.*** Cross-listed with WLF F680. (2+3)

BIOL F681 **Principles of Evolution**
4 Credits
Patterns and processes of evolutionary change are used to explore the unifying principles of the biological sciences. Basic models of population genetics, quantitative genetics, development, phylogenetics and systematics are used to build a conceptual framework for study of living systems. Special fees apply. ***Prerequisites: Graduate standing with courses in genetics, ecology and statistics; or permission of instructor.*** Stacked with BIOL F481. (3+3)

BIOL F686 **Vertebrate Paleontology**
3 Credits Offered Spring Odd-numbered Years
The study of vertebrate evolution through geologic time. Covers the temporal range, diversity and systematics of major vertebrate groups as documented in the fossil record, with an emphasis on current problems in vertebrate evolutionary pattern and process. Labs emphasize comparative morphology and identification of major vertebrate groups. ***Prerequisites: BIOL F310; or BIOL F317; or GEOS F315; or permission of instructor.*** Cross-listed with BIOL F486; GEOS F486. Stacked with GEOS F686. (2+3)

BIOL F687 **Conceptual Issues in Evolutionary Biology**
3 Credits Offered Spring Odd-numbered Years
Analysis of some of the main models which explain evolutionary change followed by consideration of the practical implications these models have on the study of biological phenomena in general. Cross-listed with PHIL F687. Stacked with BIOL F487; PHIL F487. (3+0)

BUSINESS ADMINISTRATION

Students enrolling in School of Management courses are expected to have completed the necessary prerequisites for each course.

A per semester student computing facility user fee will be assessed for student enrolling in one or more Management courses (AIS, ACCT, BA and ECON) except ECON F100X. This fee is in addition to any materials fees.

BA F151 **Introduction to Business** (s)
3 Credits
Business organization, nature of major business functions such as management, finance, accounting, marketing, personnel administration. Opportunities and requirements for professional business careers. Also available through the Center for Distance Education. (3+0)

BA F241 **Advertising, Sales and Promotion**
3 Credits Offered Fall or Spring
Advertising, publicity, sales management, sales promotion, direct marketing and the interrelationships necessary for effective promotions in domestic or international, small or large, goods or services, and for-profit or nonprofit organizations. (3+0)

BA F253 **Internship in Business**
1-3 Credits
Supervised work experience in an approved position related to the student's career interests or objectives. Number of credits depends on type of position and time worked. No student can count more than eight internship credits towards a degree. ***Prerequisites: Approval of program or department head.*** (1-3+1-3)

BA F254 **Personal Finance**
3 Credits
Emphasis on personal investments and financial management. (3+0)

BA F280 **Sports Leadership**
3 Credits Offered as Demand Warrants
Provides leadership theory and develop leadership skills for application internal and external to their sport. Focus on the identification and development of leadership skills/abilities and application within the classroom, a sport and for an on-campus project. (3+0)

BA F281 **Sports Management**
3 Credits Offered as Demand Warrants
Provides a basic understanding of managing amateur and professional sports organizations and the legal issues involved. Topics such as stadium financing, risk management contracts and human resource management, public versus private sector labor laws, collective bargaining and drug testing will be examined. ***Prerequisites: Sophomore standing.*** (3+0)

BA F305 **Leadership Alaska: Making a Difference** (s)
4 Credits Offered Spring
A leadership seminar and practicum which will involve building community, developing networks, learning leadership theories, understanding civic responsibility, and creating an action project through which the student becomes a leader. ***Prerequisites: Either be an Alaska Scholar; an Honors student; a member of the National Society of Collegiate Scholars; have a 3.25 GPA; or permission of instructor.*** (4+0)

BA F307 **Introductory Human Resources Management**
3 Credits
Introduction to management principles and personnel practice in industry, analysis of labor-management problems, methods and administration of recruiting, selecting, training and compensating employees, and labor laws and their applications. Also available through the Center for Distance Education. (3+0)

BA F317 W **Employment Law**
3 Credits Offered Fall or Spring
Basic personnel and human resource management law, including labor law and current management practices in administering collective bargaining agreements. Emphasis on the major federal and Alaska state laws affecting personnel management. ***Prerequisites: BA F307 or concurrent enrollment; ENGL F111X; ENGL F211X or ENGL F213X.*** (3+0)

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BA F323X **Business Ethics** (h)
3 Credits Offered Fall, Spring, Summer; As Demand Warrants
A grounding in ethical theories and basic issues of moral thought, with examples which highlight the pitfalls in practical ethics which future managers are likely to face, and the need to design organizations so as to promote ethical behavior. (3+0)

BA F325 **Financial Management**
3 Credits Offered Fall or Spring
Time value of money, bond and stock valuation, capital budgeting, risk-return trade-offs and option pricing. ***Prerequisites: ACCT F261; ECON F200; MATH F262X; STAT F200X.*** (3+0)

BA F330 **The Legal Environment of Business**
4 Credits
The judicial system, legal processes, administrative procedures, law of torts, contract and agency government regulation of business, business ethics, corporate social responsibility and the uniform commercial code. Also available through the Center for Distance Education. (4+0)

BA F343 **Principles of Marketing**
3 Credits
Management of a firm's marketing effort focusing on products, distribution, pricing and promotion to targeted consumers. Practices appropriate to domestic or international, small or large, goods or services, and for-profit or nonprofit organizations included. Also available through the Center for Distance Education. (3+0)

BA F360 **Operations Management**
3 Credits
Operations management with an emphasis on systematic planning, design and operation of the processes that produce goods and deliver services that customers recognize to be of superior quality. Topics include operations strategy, process design, quality control, statistical process control, project scheduling, material requirements planning and just-in-time systems. ***Prerequisites: AIS F101; STAT F200X.*** (3+0)

BA F390 **Organizational Theory and Behavior**
3 Credits
Understanding how and why organizations behave as they do, assessing whether the behavior is functional or dysfunctional, and learning to understand and change motivation, leadership, communications, group dynamics, conflict management, layout, technology, structure and policies to create high-functioning organizations. (3+0)

BA F423 W **Investment Analysis**
3 Credits Offered Spring
Introduction to investment analysis. Presents an understanding of the investment environment and analytical tools in investing. Intended for undergraduate students. ***Prerequisites: BA F325; ENGL F111X; ENGL F211X or ENGL F213X.*** (3+0)

BA F424 **Real Estate and Alternative Investments**
3 Credits Offered Spring
Develop skills required to value and finance residential and commercial real estate. Financing instruments, markets and taxation issues specific to real estate are covered in the first half; alternative investments such as REITs will be presented in the second half of the course. ***Prerequisites: BA F325.*** (3+0)

BA F436 **Consumer Behavior** (s)
3 Credits Offered Fall or Spring
Effects of nationality, culture, social class, family, personality, symbolism and persuasion on consumptive behavior. Qualitative methodologies such as focus groups covered. ***Prerequisites: BA F343 or PSY/SOC F330.*** (3+0)

BA F445 W **Marketing Research**
3 Credits Offered Fall or Spring
Basic processes and tools of marketing research with emphasis on utilization of research findings as an integral part of the managerial decision-making process. Techniques of qualitative and quantitative data-gathering and analysis to solve a marketing problem. Practices appropriate to domestic or international, small or large, goods or services, and for-profit or nonprofit organizations. ***Prerequisites: BA F343; ECON F227; ENGL F111X; ENGL F211X or ENGL F213X; upper division B.B.A. standing; or permission of the SOM advisor.*** (3+0)

BA F447 W,O **Compensation Management**
3 Credits Offered Fall or Spring
Theory and practice of wage and salary, benefits and risk management. Planning, administration, auditing, adjusting and budgeting for compensation and risk. ***Prerequisites: BA F307; COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X.*** (3+0)

BA F452 W **Internship in Emergency Management**
3 Credits Offered as Demand Warrants
A supervised practical work experience to enable students to apply their course work in a fire department or closely related field of emergency services. Admission dependent upon approved sponsorship arrangements. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; B.E.M. degree major; upper division standing; permission of instructor. Recommended: Four semesters of bachelor core; business administration courses.*** (0+6)

BA F453 **Internship in Business Administration**
1-3 Credits Offered as Demand Warrants
A supervised practical work experience to enable students to apply their coursework in a business environment. Admission dependent upon approved sponsorship arrangements. Repeated for a maximum of six credits. ***Prerequisites: Accumulative 3.0 GPA in ACCT and BA courses.*** (0+2-9)

BA F454 O **Student Investment Fund**
3 Credits
Hands-on experience in portfolio management. Students will be making investment and diversification decisions affecting the $500,000 Student Investment Fund. ***Prerequisites: COMM F131X or COMM F141X; BA F325 or equivalent; upper division B.B.A. standing; permission of the SOM advisor or instructor.*** (3+0)

BA F455 **Portfolio Management**
3 Credits
The second course involved with the hands-on management of the $500,000 Student Investment Fund. Students will carry out the duties of officers of the fund and will be responsible for portfolio diversification and management decisions affecting the fund. ***Prerequisites: BA F454; upper division B.B.A. standing; permission of the SOM advisor or instructor.*** (3+0)

BA F456 W **Small Business Management**
3 Credits Offered Fall or Spring
Operations and special problems of the small business with emphasis on both existing firms and new ventures. Starting new businesses, buying going concerns, acquiring and operating franchises, establishing lines of credit, management, legal matters, profit planning, pricing, inventory levels, record systems, tax regulations and employee supervision. ***Prerequisites: ACCT F261; ACCT F262; ENGL F111X; ENGL F211X or ENGL F213X.*** (3+0)

BA F457 **Training and Management Development**
3 Credits Offered Fall or Spring
Theory and practice of employee training programs, needs assessments, learning theories, instructional design, training techniques and evaluation, management development and career development techniques and practices. ***Prerequisites: BA F307.*** (3+0)

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BA F460 O **International Business**
3 Credits Offered Fall or Spring
Relationships among nations with particular emphasis on the business, economic, and sociocultural institutions that influence the performance of managers. Formulation of objectives, strategies and organizational structures within the context of international diversity. ***Prerequisites: COMM F131X or COMM F141X. Recommended: Senior standing.*** (3+0)

BA F461 **International Finance**
3 Credits Offered Fall or Spring
Development of analytical skills, logical thought processes and information literacy necessary to make and implement investment decisions in a global setting. ***Prerequisites: BA F325.*** (3+0)

BA F462 O **Corporate Strategy**
3 Credits
An integrative approach to strategy formation and implementation to achieve organization goals. Students will be introduced to theoretical perspectives and associated methodologies directed toward resolving the unstructured problems and opportunities which confront general managers at the highest levels of an organization. ***Prerequisites: COMM F131X or COMM F141X; ACCT F352 or ACCT F342; BA F325; BA F343; BA F360; BA F390; ECON F321 or ECON F322 or ECON F324 or ECON F350; upper division B.B.A. standing; or permission of the SOM advisor. Exception: B.B.A. economics majors do not need ACCT F352 or ACCT F342.*** (3+0)

BA F467 **Current Topics in Management**
3 Credits Offered Fall or Spring
Examines current management trends with regard to major theories and practices in the field. Topics of interest could include organizational development, performance appraisal, personnel selection and international human resources management. ***Prerequisites: BA 307; BA 390.*** (3+0)

BA F490 **Services Marketing**
3 Credits Offered Fall or Spring
Marketing principles in the service sector with special emphasis on such service industries as banking, healthcare, recreation, retailing and tourism. Includes practices appropriate to domestic or international, small or large, and for-profit organizations. ***Prerequisites: BA F343.*** (3+0)

BA F491 **Current Topics in Marketing**
3 Credits Offered Fall or Spring
Examines current marketing trends with regard to production, distribution, promotion, pricing and target markets. Focus on trends in Alaska, the U.S. and worldwide. ***Prerequisites: BA F343.*** (3+0)

BA F607 **Human Resources Management**
3 Credits Offered Fall or Spring, As Demand Warrants
The study of the effective management of human resources in organizations to include employee planning and recruiting, selection and orientation, training and career development, performance evaluation, compensation, EEO, occupational safety and health, and labor relations. ***Prerequisites: Graduate standing or permission of M.B.A. director.*** (3+0)

BA F617 **Organizational Theory for Managers**
3 Credits Offered Fall or Spring
Overview of the history, concepts, literature and applications in organizational theory. Emphasis on applications and cases applying organizational theory concepts to management. ***Prerequisites: Graduate standing or permission of M.B.A. director.*** (3+0)

BA F620 **Portfolio Theory and Asset Pricing**
3 Credits Offered as Demand Warrants
Examination of modern normative portfolio theory and asset pricing. Includes mathematics of portfolio analysis, single-period risk and return measures, and the process of optimal portfolio selection. ***Prerequisites: M.B.A. standing.*** (3+0)

BA F630 **Derivative Securities**
3 Credits Offered as Demand Warrants
Derivative securities including options strategies, binomial and Black-Scholes pricing models, commodity and interest-rate futures, hedging strategies using options and futures, and risk management. ***Prerequisites: M.B.A. standing.*** (3+0)

BA F643 **Marketing Management**
3 Credits Offered Fall or Spring
Provides managerial approach to examining processes for identifying prospective opportunities, as well as review of marketing mix elements relating to planning, developing and implementing marketing plans. Topics include market segmentation, buyer behavior, product policy and strategy, pricing, promotion and sales force management, distribution channel policy, competitive behavior, market research and marketing ethics. ***Prerequisites: Graduate standing or permission of M.B.A. director.*** (3+0)

BA F652 **Fundamentals of Business**
3 Credits Offered Fall
Introduction to business and management. Class sessions will be used to overview all functional business disciplines and to discuss the disciplines in relation to one another. ***Graduate standing; or permission of M.B.A. Director.*** (3+0)

BA F675 **Quantitative Methods for Managers**
3 Credits Offered Fall or Spring
An in-depth treatment of quantitative research methods in an applied context. The usefulness of those techniques to the managerial decision-making process. Research skills are presented as a set of tools that enable managers to make better decisions. ***Prerequisites: STAT F200X or equivalent and graduate standing; or permission of M.B.A. director.*** (3+0)

BA F680 **Financial Markets and Strategy**
3 Credits Offered Fall or Spring
Description of capital markets, development of the major financial theories that explain how to value financial instruments, and examination of how these theories can be used by corporations to evaluate real investments. How firms choose among the various instruments available to them for financing operations and how these instruments help firms manage risks. These corporate financial decisions are viewed as part of the overall corporate strategy of firms, affecting investment and operating strategies, product market strategies, and the ways in which executives are compensated. ***Prerequisites: ACCT F602; graduate standing; or permission of M.B.A. director.*** (3+0)

BA F681 **Fixed Income Securities and Markets**
3 Credits Offered Fall or Spring, As Demand Warrants
Fixed income securities and markets including treasury, agency, mortgage-backed and corporate securities, municipal bonds and derivatives. Introduces technical issues relating to duration, convexity and bond-portfolio management. ***Prerequisites: M.B.A. standing.*** (3+0)

BA F682 **Financial Statement Analysis**
3 Credits Offered Fall or Spring, As Demand Warrants
How to comprehend and critically evaluate financial statements. Building on topics introduced in a first-year course in financial accounting, analyze additional disclosures typically included in financial statements. These activities will be useful in tasks related to valuation, credit decisions, competitor assessment and bankruptcy predictions. ***Prerequisites: M.B.A. standing.*** (3+0)

BA F683 **Advanced Topics in Marketing**
3 Credits Offered Fall or Spring, As Demand Warrants
Current topics and issues in marketing management, such as political and services marketing, marketing communications, marketing in Alaska or other relevant subjects. Note: May be taken twice for credit when topic changes. ***Prerequisites: M.B.A. standing.*** (3+0)

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BA F690 **Corporate Strategy**
3 Credits Offered Fall or Spring
An integrative approach to strategy formation and implementation (decision-making) to achieve organization goals. Students will be introduced to theoretical perspectives and associated methodologies directed toward resolving the unstructured problems and opportunities which confront general managers at the highest levels of an organization. BA F690 is an advanced seminar taken during the student's last spring semester. ***Prerequisites: M.B.A. standing.*** (3+0)

BA F691 **Advanced Topics in Business**
3 Credits Offered Fall or Spring, As Demand Warrants
Developing managers' ability to excel in specialized areas of business such as entrepreneurship and risk management. May be taken twice for credit when topic changes. Note: May be taken twice for credit when topic changes. ***Prerequisites: M.B.A. standing.*** (3+0)

CHEMISTRY

A per semester fee for computer facilities will be assessed for one or more CHEM courses at the F200-level and above. This fee is in addition to any lab/materials fees.

CHEM F075 **Introduction to Chemical Sciences**
3 Credits Offered as Demand Warrants
Units of measurement, atomic and molecular structure, chemical bonding, metabolism, radioactivity, oxidation-reduction reactions, solutions, acids and buffers. For the non-science major. (3+0)

CHEM F100X **Chemistry in Complex Systems** (n)
4 Credits
Fundamentals of chemistry with an emphasis on the role of chemistry in environmental and life systems. The role of feedback systems on chemical behavior is illustrated in atmospheric, aquatic, nuclear and nutritional systems. For non-science majors. Special fees apply. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+3)

CHEM F103X **Basic General Chemistry** (n)
4 Credits Offered Fall
Fundamentals of chemistry including historical and descriptive aspects as well as basic mathematical concepts. Fulfills the laboratory part of the natural science requirement and prepares the student for CHEM F105X. Note: This course satisfies elective credit only. Special fees apply. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+3)

CHEM F104X **A Survey of Organic Chemistry and Biochemistry** (n)
4 Credits Offered Spring
Fundamentals of chemistry as applied to biological systems. Bridges the gap between a general chemistry course and biochemical concepts of other health-related sciences. Recommended for health-science degree candidates and non-science majors interested in the central role of chemistry in life. May be used to meet the general laboratory science requirement or for preparation for CHEM F105X. Special fees apply. ***Prerequisites: CHEM F103X; placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+3)

CHEM F105X **General Chemistry I** (n)
4 Credits
CHEM F105X-F106X, together, constitute the standard one-year engineering and science-major general chemistry course with laboratory. Major subjects include measurements, calculations, atomic and molecular structure, gas laws, stoichiometry, an introduction to organic chemistry, chemical reactions and related energy changes. Special fees apply. ***Prerequisites: Placement in ENGL F111X or higher; placement in MATH F107X or higher; or a B or better in CHEM F103X; or permission of instructor and department chair.*** (3+3)

CHEM F106X **General Chemistry II** (n)
4 Credits
Major subjects include reaction kinetics, equilibrium (including acids and bases, solubility and complex ion formation), nuclear chemistry, electrochemistry, and descriptive chemistry of the elements. Special fees apply. ***Prerequisites: C Grade or better in CHEM F105X; placement in ENGL F111X or higher; placement in MATH F107X or higher; or permission of instructor and department chair.*** (3+3)

CHEM F190 **Alaska Statewide High School Science Symposium**
2 Credits Offered Spring
Students employ the scientific method to approach a problem of personal interest. Student work is molded into a research paper delivered orally in a formal scientific presentation for judges with wide-ranging experiences. Graded Pass/Fail. Special fees apply. ***Prerequisites: High School student grades 9-12. Recommended: Research completion, abstract and paper writing/submission, ASHSSS presentation.*** (0+10)

CHEM F202 **Basic Inorganic Chemistry** (n)
3 Credits Offered Spring
Lecture includes brief review of general chemistry, atomic structure, covalent bonds, molecular structure, nuclear chemistry, group theory and molecular symmetry. Lab involves the synthesis of known and novel inorganic complexes using a glovebox and Schlenk/vacuum line techniques, and characterization of the complexes by nuclear magnetic resonance, infrared, ultraviolet-visible absorption and mass spectroscopies. Furthermore, cyclic voltammetry, HyperChem calculations, and SciFinder Scholar are used and students give oral presentations describing lab projects at the end of the year. presentations. Special fees apply. ***Prerequisites: CHEM F106X.*** (2+3)

CHEM F212 **Chemical Equilibrium and Analysis** (n)
4 Credits Offered Fall
Aqueous chemical equilibrium as applied to chemical analysis, separations, spectrophotometry, potentiometry and factors considered in the analytical approach. Lab portion will include introductory experiments in analytical and instrumental techniques. ***Prerequisites: Grade of C or better in CHEM F106X; MATH F107X or equivalent.*** (3+3)

CHEM F261 **Introduction to Cell and Molecular Biology** (n)
4 Credits
An introduction to the structure and function of cells. Topics include: the structure and function of cellular components, including proteins, membranes and organelles; understanding how cells communicate; and how information is processed in the cell via DNA replication, transcription and translation. Special fees apply. ***Prerequisites: BIOL F115X; BIOL F116X; CHEM F105X; CHEM F106X.*** Cross-listed with BIOL F261. (3+3)

CHEM F312 **Instrumental Analysis** (n)
4 Credits Offered Fall
Analytical theory, instrumentation, and methodology course focused on the analysis of inorganic and organic compounds present in various environmental matrices. Subjects include gas and liquid chromatography, atomic spectrophotometry, electrochemistry, and mass spectrometry. The lab component of the course will allow students an opportunity to directly apply lecture material in hands-on experiments using modern analytical instrumentation. ***Prerequisites: CHEM F212. Co-requisites: CHEM F331.*** (3+3)

CHEM F313 **Chemical Analysis of Dynamic Systems** (n)
2 Credits Offered Fall
Introduction to modern methods of chemical analysis for the solution of specific environmental or biochemical problems. Focus on planning efficient experiments, assuring reliable results and specific operations done in the lab. Laboratory experiments are multi-week projects requiring bench chemistry and instrumental methods. Collaborative groups are used in the laboratory and in writing laboratory reports. Special fees apply. ***Co-requisite: CHEM F212 or junior standing.*** (1+4)

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CHEM F321 **Organic Chemistry I**
3 Credits Offered Fall
A systematic study of the more important functional groups of carbon compounds, including their mechanisms of reaction, methods of synthesis, and physical and spectroscopic properties. ***Prerequisites: CHEM F106X or permission of instructor.*** (3+0)

CHEM F322 **Organic Chemistry II**
3 Credits Offered Spring
A systematic study of the more important functional groups of carbon compounds, including their mechanisms of reaction, methods of synthesis and physical and spectroscopic properties. ***Prerequisites: CHEM F321 or permission of instructor.*** (3+0)

CHEM F324 W **Organic Laboratory** (n)
4 Credits
A laboratory designed to illustrate modern techniques of isolation, purification, analysis and structure determination of covalent, principally organic, compounds. Enrollment limited. Contact department (474-5510 or fychem@uaf.edu) early to get on the wait list. Special fees apply. ***Prerequisites: ENGL F111X; ENGL 211X or ENGL F213X; or permission of instructor. Co-requisites: CHEM F322.*** (2+6)

CHEM F331 **Physical Chemistry**
4 Credits Offered Fall
Principles of thermodynamics and kinetics with applications to phase equilibria, solutions, chemical equilibrium and electrochemistry. Course teaches these concepts using both lecture and laboratory instruction. ***Prerequisites: CHEM F106X; MATH F202X; PHYS F104X or PHYS F212X; or permission of instructor.*** (3+3)

CHEM F332 **Physical Chemistry II**
4 Credits Offered Spring
Atomic and molecular structure, and spectroscopy, and statistical mechanics. Course teaches these concepts using both lecture and laboratory instruction. ***Prerequisites: CHEM F331 or permission of instructor.*** (3+3)

CHEM F402 **Inorganic Chemistry**
3 Credits Offered Fall
Symmetry and group theory, molecular orbital theory, solid state chemistry, acids and bases, redox reactions, non-aqueous solvents, descriptive chemistry of some main group elements. ***Prerequisites: CHEM F202; CHEM F322; CHEM F332.*** (1+6)

CHEM F406 **Atmospheric Chemistry**
3 Credits Offered Spring Odd-numbered Years
Chemistry of the lower atmosphere (troposphere and stratosphere) including photochemistry, kinetics, thermodynamics, box modeling, biogeochemical cycles and measurement techniques for atmospheric pollutants; study of important impacts to the atmosphere which result from anthropogenic emissions of pollutants, including acid rain, the "greenhouse" effect, urban smog and stratospheric ozone depletion. ***Prerequisites: CHEM F332 or equivalent or permission of instructor.*** Stacked with CHEM F606; ATM F606. (3+0)

CHEM F413 W **Analytical Instrumental Laboratory** (n)
3 Credits Offered Spring
A laboratory course focusing on the acquisition and interpretation of chromatographic and spectroscopic data for quantitative chemical measurements. Students will learn effective experimental planning and execution, critical evaluation of experimental data and written communication in the context of the chemical sciences. Special fees apply. ***Prerequisites: CHEM F312; ENGL F111X; ENGL F211X or ENGL F213X. Co-requisite: CHEM F332. Chemistry major or permission of instructor.*** (3+0)

CHEM F418 W **Developmental Biology** (n)
4 Credits Offered Spring Even-numbered Years
Morphological and molecular aspects of the development of multicellular organisms, with emphasis on the regulation of morphogenesis. Laboratory involves team-based research focusing on fundamental aspects of vertebrate embryo development. ***Prerequisites: BIOL F115X; BIOL F116X; BIOL F310; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** Cross-listed with BIOL F418. (3+3)

CHEM F420 **NMR Spectroscopy of Natural Products**
3 Credits Offered Spring Odd-numbered Years
Use of nuclear magnetic resonance (NMR) spectroscopy for the interpretation of the structure of organic molecules. Both one- and two-dimensional techniques will be covered. Theory will be introduced but most of the course will be structural elucidation by NMR. Includes training and use of the Varian Mercury NMR instrument. ***Prerequisites: CHEM F321; CHEM F322.*** Stacked with CHEM F620. (3+0)

CHEM F434 W **Instrumental Methods in Physical Chemistry** (n)
3 Credits Offered Fall
A modern laboratory course with three major components: 1) experiments related to concepts learned in CHEM F331 and CHEM F332 including, but not limited to, spectroscopy, conductance, and diffusion; 2) computer use in problem solving, data analysis and word processing; and 3) technical writing with emphasis on preparation of papers for publication. Special fees apply. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor. Co-requisites: CHEM F332.*** (1+6)

CHEM F445 **Molecular Evolution**
4 Credits Offered Fall Odd-numbered Years
The study of structure, function and evolution of hereditary molecules (nucleic acids). Special fees apply. ***Prerequisites: BIOL F362.*** Stacked with CHEM F645. (3+3)

CHEM F450 **General Biochemistry — Macromolecules**
3 Credits Offered Fall
Focuses on the biochemistry of the two principal macromolecules: nucleic acids and proteins. Topics include: nucleotides metabolism, DNA structure and topology, DNA replication, DNA repair and recombination, cell cycle regulation, RNA transcription and processing. Gene expression, translation and protein metabolism. Biomedical relevance and contemporary techniques will be addressed if appropriate. ***Prerequisites: CHEM F322 or permission of instructor.*** (3+0)

CHEM F451 **General Biochemistry — Metabolism**
3 Credits Offered Spring
The biochemistry of metabolism. Topics include: chemistry of amino acids and its implication, protein structure-function, enzyme catalysis, glucose and glycogen metabolism and regulation, bioenergetics, lipid metabolism and biomembranes, amino acid metabolism and regulation of metabolism. Biomedical relevance and contemporary techniques will be addressed if appropriate. ***Prerequisites: CHEM F322; or permission of instructor. Recommended: CHEM F331.*** (3+0)

CHEM F453 O/2 **Molecular Biology**
4 Credits Offered Fall Odd-numbered Years
Provides in-depth coverage of eukaryotic and prokaryotic gene function, including the applications of recombinant DNA technology to the biological sciences. ***Prerequisites: BIOL F362 or CHEM F321 or BIOL F303; COMM F131X or COMM F141X; or permission of instructor.*** Cross-listed with BIOL F453. Stacked with CHEM F653; BIOL F653. (3+3)

CHEM F455 W,O **Environmental Toxicology**
3 Credits Offered Spring Even-numbered Years
Environmental toxicology will focus on the general properties and principles of persistent and/or poisonous (toxic) chemicals commonly encountered in air, water, fish and wildlife. Numerous natural and synthetic chemicals in the environment will be discussed from a global perspective with some bias towards arctic and subarctic regions. Special fees apply. Cross-listed with BIOL F455. (0+0)

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CHEM F470 Cellular and Molecular Neuroscience
3 Credits Offered Fall
This 3 credit course is team-taught by neuroscience faculty in Chemistry and Biology. The course goal is to provide a comprehensive overview of the molecular and cellular aspects of the adult and developing nervous system in vertebrates, particularly humans. Topics addressed will include neuroanatomy, electrophysiology and synaptic transmission, cellular neuroscience, neuropharmacology, and neurodevelopment. ***Prerequisites: Two F300-level courses in BIOL or CHEM or PSY 345; or permission of instructor.*** Stacked with CHEM F670. Cross-listed with BIOL F679. (3+0)

CHEM F472 Systems Neuroscience
3 Credits Offered Spring
This 3 credit course is given in collaboration with the University of Montana and Montana State University. The course goal is to provide a comprehensive overview into the architecture and function of various neurological systems in the mammalian central nervous system, particularly in humans. Topics addressed will include but are not limited to the visual system, the auditory system, the limbic system, pain, neuropathologies, and CNS injuries. Each topic will address known and suspected pathologies and include discussions with clinicians from the St. Patrick Hospital and Health Sciences Center in Missoula, MT. This course will be taught using Access Grid Node technology, an audio/video internet broadcasting system. ***Prerequisites: Two F300-level courses in Biology/Chemistry, or Psychology/Philosophy; or permission of instructor.*** Stacked with CHEM F672. (3+0)

CHEM F474 Neurochemistry
3 Credits Offered Spring Even-numbered Years
Covers basic and applied aspects of interneuronal signaling of specific neurotransmitter systems. Lectures will be based on chapters from assigned text as well as recent and historical literature relevant to these topics. Basic concepts introduced in lectures will be applied through guided discussion of original research papers. Students will learn to prepare "peer reviews" of selected papers and critically discuss original research. ***Prerequisites: BIOL F115X; CHEM F322; BIOL F417O or CHEM F470 or PSY F335.*** (3+0)

CHEM F481 Seminar
1 Credit
Introduction to the techniques and style of technical oral presentation generally accepted by professional chemists. Class will meet two hours per week, the first hour in closed session, the second, open to the public. Seminar attendance and participation in observing and critiquing presentations by graduate students, chemistry faculty, and their peers is required. Note: Oral communication intensive credit is earned upon successful completion of CHEM F482. Graded Pass/Fail. ***Prerequisites: COMM F131X or COMM F141X.*** (2+0)

CHEM F482 O Seminar
2 Credits
Introduction to the techniques and style of technical oral presentation generally accepted by professional chemists. Class will meet two hours per week, the first hour in closed session, the second, open to the public. Preparation of a 40 minute presentation to be delivered twice, first, to others in the course in the closed session for critiquing and suggestions for improvement and later, in the open seminar for evaluation by all. ***Prerequisites: CHEM F481; COMM F131X or COMM F141X.*** (2+0)

CHEM F488 Undergraduate Chemistry and Biochemistry Research
1-6 Credits
Advanced research topics from outside the usual undergraduate laboratory offerings. The student will be required to make presentations and turn in a final report. Research areas range from atmospheric chemistry to molecular biology. A substantial level of chemistry or biochemistry background is assumed. Special fees apply. (0+1-6)

CHEM F601 Introduction to Atmospheric Science
3 Credits Offered Fall
Fundamentals of atmospheric science. Includes energy and mass conservation, internal energy and entropy, atmospheric water vapor, cloud microphysics, equations of motion, hydrostatics, phase oxidation, heterogeneous chemistry, the ozone layer, fundamentals of biogeochemical cycles, solar and terrestrial radiation and radiative-convective equilibrium. Also includes molecular, cloud and aerosol absorption and scattering. ***Prerequisites: Graduate standing.*** Cross-listed with ATM F601. Stacked with ATM F401. (3+0)

CHEM F602 Advanced Inorganic Chemistry
3 Credits Offered Spring Odd-numbered Years
Symmetry and group theory, molecular orbital theory, descriptive chemistry of some main group elements and the transition metals, coordination chemistry and crystal field theory, kinetics and mechanisms, organometallic chemistry, bioinorganic chemistry. ***Prerequisites: CHEM F402.*** (3+0)

CHEM F605 Aquatic Chemistry
3 Credits Offered Fall Even-numbered Years
Chemistry of aquatic systems, including the development of equilibrium and kinetic models to understanding the speciation, transformation and partitioning of inorganic chemical species in natural and engineered water systems. Emphasis is on the study of acid-base chemistry, complexation, precipitation-dissolution and reduction-oxidation reactions. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with ENVE F641. (3+0)

CHEM F606 Atmospheric Chemistry
3 Credits Offered Spring Odd-numbered Years
Chemistry of the lower atmosphere (troposphere and stratosphere) including photochemistry, kinetics, thermodynamics, box modeling, biogeochemical cycles and measurement techniques for atmospheric pollutants; study of important impacts to the atmosphere which result from anthropogenic emissions of pollutants, including acid rain, the "greenhouse" effect, urban smog and stratospheric ozone depletion. ***Prerequisites/Co-requisite: ATM F601 or permission of instructor.*** Cross-listed with ATM F606. Stacked with CHEM F406. (3+0)

CHEM F609 Environmental Geochemistry
3 Credits Offered Spring Even-numbered Years
Focus on advanced topics and methods in chemistry of aquatic and soil environments. Detailed treatment of the thermodynamic, kinetic and structural principles involved in the description and modeling of low-temperature aqueous geochemical systems. Particular emphasis on heterogeneous interactions, including dissolution/precipitation, sorption and microbial processes, involved in the partitioning, transformation and transport of chemical species in the environment. ***Prerequisites: ENVE F641 or GEOS F618 or permission of instructor.*** Cross-listed with GEOS F633. (3+0)

CHEM F612 Advanced Analytical Chemistry: Chemometrics
3 Credits Offered Spring Odd-numbered Years
Strategies and methods used by analytical chemists to maximize the chemical information content of data obtained in chemical measurements (i.e. chemometrics). Methods include univariate and multivariate approaches. Topics include the design of experiments, sampling, instrumental calibration and prediction, robust statistical methods, data preprocessing and pattern recognition. Emphasis on examples in optical spectroscopy, field analytical chemistry and iterative investigations. ***Prerequisites: CHEM F332; CHEM F412; or permission of instructor.*** (3+0)

CHEM F620 NMR Spectroscopy of Natural Products
3 Credits Offered Spring Odd-numbered Years
Use of nuclear magnetic resonance (NMR) spectroscopy for the interpretation of the structure of organic molecules. Both one- and two-dimensional techniques will be covered. Theory will be introduced but most of the course will be structural elucidation by NMR. Includes training and use of the Varian Mercury NMR instrument. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with CHEM F420. (3+0)

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CHEM F621 Enzymology and Bio-Organic Chemistry
3 Credits Offered Spring Even-numbered Years
Applications of the methods and concepts of physical organic chemistry to enzyme-catalyzed reactions. ***Prerequisites: CHEM F451.*** (3+0)

CHEM F622 Biosynthesis of Plant Natural Products
3 Credits Offered Fall Even-numbered Years
Three major pathways of plant secondary metabolism: terpene, shikimate and acetogenic pathways. Includes discussion of offshoots of these pathways to various classes of alkaloids. Use of stable and radioisotopes in conjunction with modern NMR spectroscopy and kinetic isotope effects will be stressed. ***Prerequisites: CHEM F322.*** (3+0)

CHEM F623 Molecular Modeling
3 Credits Offered Spring Even-numbered Years
Theory and practice of quantum and molecular mechanics methods in organic, physical, inorganic and environmental chemistry and biochemistry; applications of computational software on workstations and multi-processor servers. ***Prerequisites: Graduate standing in chemistry of biochemistry, one year each of undergraduate organic, physical and analytical chemistry or equivalent or permission of instructor. Recommended: CHEM F402.*** (2+0+3)

CHEM F631 Environmental Fate and Transport
3 Credits Offered Spring Even-numbered Years
Examination of the physical properties that govern the behavior, fate and transport of contaminants released into the environment. Topics include air-water partitioning and exchange, organic solvent-water partitioning, diffusion, sorption, chemical and biological transformation reactions, and modeling concepts. Cross-listed with ATM F631. (3+0)

CHEM F632 Molecular Spectroscopy
3 Credits Offered Spring Odd-numbered Years
Application of quantum mechanics to molecular bonding and spectroscopy. Topics include: applications of lasers to probe chemical reactivity, photochemistry and the detection of trace compounds in mixtures. Variable content. May be repeated for credit. ***Prerequisites: CHEM F332.*** (3+0)

CHEM F645 Molecular Evolution
4 Credits Offered Fall Odd-Numbered Years
Structure, function and evolution of hereditary molecules (nucleic acids). Special fees apply. ***Prerequisites: BIOL F362 or permission of instructor.*** Stacked with CHEM F445. (3+3)

CHEM F653 Molecular Biology
4 Credits Offered Fall Odd-numbered Years
In-depth coverage of eukaryotic and prokaryotic gene function, including the applications of recombinant DNA technology to the biological sciences. ***Prerequisites: BIOL F362 or CHEM F321 or BIOL F303, or permission of instructor.*** Cross-listed with BIOL F653. Stacked with CHEM F453; BIOL F453. (3+3)

CHEM F654 Protein Structure and Function
3 Credits Offered Fall Odd-numbered Years
Contemporary topics in peptide and protein biochemistry. Topics include peptide synthesis, protein modification, comparative aspects of structure, protein engineering, enzyme and receptor function as well as molecular modeling. ***Prerequisites: CHEM F451.*** (3+0)

CHEM F655 Environmental Toxicology
3 Credits Offered Spring Even-numbered Years
Environmental toxicology will focus on the general properties and principles of persistent and/or poisonous (toxic) chemicals commonly encountered in air, water, fish and wildlife. Numerous natural and synthetic chemicals in the environment will be discussed from a global perspective with some bias towards arctic and subarctic regions. Special fees apply. ***Prerequisites: CHEM F451; BIOL F303; or one semester each of organic chemistry and cell or molecular biology or permission of instructor.*** Cross-listed with BIOL F655. Stacked with BIOL F455; CHEM F455. (3+0)

CHEM F657 Molecular Foundations of Gene Expression
3 Credits Offered Fall Even-numbered Years
The molecular regulation of gene expression in prokaryotes and eukaryotes in the context of development and disease. Major topics include: protein/DNA interactions, structure-function relations of transcription factors, signal transduction, control of transcription and translation, chromatin structure and DNA replication. ***Prerequisites: CHEM F451; CHEM F456; CHEM F461 or equivalent; or permission of instructor.*** (3+0)

CHEM F658 Current Techniques in Biochemistry
3 Credits Offered Spring Even-numbered Years
Focuses on current techniques in biochemistry. This is a laboratory intensive course covering: Restriction Enzymes, polymerase chain reaction (PCR), DNA electrophoresis, Enzyme Linked Immunosorbent Assays (ELISA), DNA recombination and cloning, protein purification by affinity chromatography, protein electrophoresis, Western blots, enzyme kinetics, protein quantification by spectrophotometry, and basic tissue culture techniques. It is an important goal of this graduate course to emphasize experimental design, evaluation, and trouble shooting within each of the biochemical techniques and also to challenge students to develop their own experimental designs, evaluate the scope and limitations of the design/technique, and propose solutions for potential problems. Special fees apply. ***Prerequisite: CHEM F450; CHEM F451; graduate standing; or permission of the instructor.*** (1+6)

CHEM F660 Chemical Oceanography
3 Credits Offered Spring
An integrated study of the chemical, biological and physical processes that determine the distribution of chemical variables in the sea. The distribution of stable and radioisotopes are used to follow complex chemical cycles, with particular emphasis on the cycles of nutrient elements. The chemistry of carbon is considered in detail. Implications of the mid-ocean ridge vent system to ocean chemistry are examined. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with MSL F660. (3+0)

CHEM F670 Cellular and Molecular Neuroscience
3 Credits Offered Fall
This 3 credit course is team-taught by neuroscience faculty in Chemistry and Biology. The course goal is to provide a comprehensive overview of the molecular and cellular aspects of the adult and developing nervous system in vertebrates, particularly humans. Topics addressed will include neuroanatomy, electrophysiology and synaptic transmission, cellular neuroscience, neuropharmacology, and neurodevelopment. ***Prerequisites: Two F300-level courses in BIOL or CHEM or PSY F345 or permission of instructor.*** Stacked with CHEM F470. Cross-listed with BIOL F679. (3+0)

CHEM F672 Systems Neuroscience
3 Credits Offered Spring
This 3 credit course is taught in collaboration with the University of Montana and Montana State University. A comprehensive overview into the architecture and function of various neurological systems in the mammalian central nervous system, particularly in humans. Topics will include but are not limited to the visual system, the auditory system, the limbic system, pain, neuropathologies and CNS injuries. Each topic will address known and suspected pathologies and include discussions with clinicians from the St. Patrick Hospital and Health Sciences Center in Missoula, MT. The course will be taught using Access Grid Node technology, an audio/video internet broadcasting system. ***Prerequisites: Two F300-level courses in BIOL/CHEM or PSY/PHIL or graduate standing or permission of instructor.*** Stacked with CHEM F472. (3+0)

CHEM F674 Membrane Biochemistry and Biophysics
3 Credits Offered Fall Odd-numbered Years
Basic biophysical and molecular processes associated with membrane-mediated events in the context of cellular physiology. Major topics includes biochemical and biophysical characteristics of membrane lipids; structure-function relation of membrane proteins; protein trafficking/targeting; vesicle transport and membrane fusion/exocytosis; the nature of membrane excitability; and the role of membrane in bioenergetics. ***Prerequisites: CHEM F451; CHEM F456; CHEM F461 or equivalent, or permission of instructor.*** (3+0)

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CHEM F688 **Biochemical and Molecular Biology Seminar**
0-1 Credit
A seminar on various topics related to biochemistry and molecular biology including discussions of recent literature and research results. (1+0)

CHEM F691 **Research Presentation Techniques**
1 Credit Offered Spring
Review of recent research in chemistry to expose students to recent findings, methodologies and concepts in a broad range of chemistry and related disciplines. How to present and defend research proposals. Course may be repeated for credit. ***Prerequisites: Graduate standing in physical sciences or permission of instructor.*** (1+0)

CHEM F692 **Seminar**
1 Credit
Graded Pass/Fail. (1+0)

CHINESE

CHNS F101 **Elementary Chinese I** (h)
5 Credits Offered Fall Odd-numbered Years
First year spoken and written Chinese. Emphasis on the basic elements of the language to acquire skills in listening, speaking, reading and writing. About 300 characters will be taught. Cultural aspects will be presented. (5+0)

CHNS F102 **Elementary Chinese II** (h)
5 Credits Offered Spring Even-numbered Years
First year spoken and written Chinese. Emphasis on the basic elements of the language to acquire skills in listening, speaking, reading and writing. Approximately 300 characters will be taught. Cultural aspects are presented. ***Prerequisites: CHIN F101 or equivalent.*** (5+0)

CHNS F201 **Intermediate Chinese I** (h)
4 Credits Offered Fall Even-numbered Years
Continuation of CHNS F102. Continue to gain language skills by learning more characters/vocabulary and broadened sentence patterns. About 200 characters and 700 vocabulary words will be taught. ***Prerequisites: CHNS F102 or equivalent.*** (4+0)

CHNS F202 **Intermediate Chinese II** (h)
4 Credits Offered Spring Odd-numbered Years
Continuation of CHNS F102. Continue to gain language skills by learning more characters/vocabulary and broadened sentence patterns. About 200 characters and 700 vocabulary words will be taught. ***Prerequisites: CHNS F201 or equivalent.*** (4+0)

CIVIL ENGINEERING

A per semester fee for computing facility user fee is assessed for CEM engineering courses. This fee is in addition to any lab/materials fee.

CE F112 **Elementary Surveying**
3 Credits Offered Spring
Basic plane surveying; use of transit, level, theodolite and total station. Traverses, public land system, circular curves, cross-sectioning and earthwork. Special fees apply. ***Prerequisites: MATH F108.*** (2+3)

CE F302 **Introduction to Transportation Engineering**
3 Credits Offered Fall
Introduction to multimodal transportation systems and the factors that influence the planning, design and operation of the systems. ***Prerequisites: CE junior standing or permission of instructor.*** (3+0)

CE F326 **Introduction to Geotechnical Engineering**
4 Credits Offered Spring
Fundamentals of geotechnical engineering including identification and classification of soil, physical and mechanical properties of soil, subsurface exploration, laboratory testing techniques, seepage, compaction, stresses in soil, soil consolidation, and drained and undrained shear strength of soil. Special fees apply. ***Prerequisites: ES F331; GE F261.*** (3+3)

CE F331 **Structural Analysis**
3 Credits Offered Spring
Analysis of statically determinate and indeterminate structures to include beams, trusses and frames. Internal force resultants, shear and moment diagrams, deflections, internal stresses. Influence lines and criteria for moving loads. Indeterminate analysis to include methods of consistent deflections, slope deflection and moment distribution. Introduction to matrix methods. Special fees apply. (2+3)

CE F334 **Properties of Materials**
3 Credits Offered Fall
Properties of engineering materials. Bonding, crystal and amorphous structures. Relationships between microstructure and engineering properties. Modification of properties and environmental serviceability. Concrete and asphalt mixes. Special fees apply. ***Co-requisite: ES F331.*** (2+3)

CE F341 **Environmental Engineering**
4 Credits Offered Spring
Fundamentals of environmental engineering including theory and application of water and wastewater, solid waste and air quality engineering practice; natural processes that influence pollutant fate and use of these processes in engineered systems for pollution control. ***Prerequisites: CHEM F106X; ES F341; or graduate standing.*** (3+3)

CE F344 **Water Resources Engineering**
3 Credits Offered Fall
Fundamentals of engineering hydrology and hydraulic engineering. Water cycle and water balance, precipitation, evaporation, runoff, statistical methods, flood control, open channels and groundwater. Special fees apply. ***Prerequisites: ES F341.*** (3+0)

CE F400 **FE Exam**
0 Credits
Complete the FE application and take the State of Alaska Fundamentals of Engineering Exam in the same semester of course enrollment. Graded Pass/Fail. ***Prerequisites: Senior standing in civil engineering.*** (0+0)

CE F405 **Highway Engineering**
3 Credits Offered Fall
Design of geometric elements of streets and highways with emphasis on safety and efficiency. Roadway functional classification, design controls, vertical and horizontal alignments, cross sections, interchanges and intersections. ***Co-requisite: CE F302 or permission of instructor.*** (2+3)

CE F406 **Traffic Engineering**
3 Credits Offered Spring
Operation and control of transportation systems with emphasis on traffic on highways and streets. Traffic control devices, data collection, capacity and level of service analysis, intersection signalization, traffic impact analysis, accident analysis and other safety considerations. ***Prerequisites: CE F405 or permission of instructor.*** (2+3)

CE F415 **Advanced Surveying**
3 Credits Offered Fall
Azimuth by astronomic methods. Route surveying, including horizontal and vertical curves, spirals, cross-sectioning and earthwork. Reduction of electronic distance measurements. Alaska State Plane Coordinate System, both old (NAD27) and new (NAD83). Special fees apply. ***Prerequisites: CE F112.*** (2+3)

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CE F416 **Boundary Surveying**
1 Credit Offered as Demand Warrants
Surveying problems related to land subdivision with emphasis on the legal aspects. Metes and bounds descriptions and platted subdivisions. ***Prerequisites: CE F112 or permission of instructor.*** (1+0)

CE F422 **Foundation Engineering**
3 Credits Offered Fall
Bearing capacity of soils and effects of settlements on structure. Design of footings and rafts, pile and pier foundations, retaining walls and anchored bulkheads. Foundations on frozen soils and construction problems in foundation engineering. An introduction to slope stability analysis. ***Prerequisites: CE F326; ES F301.*** (3+0)

CE F423 **Introduction to Earthquake Engineering**
3 Credits Offered Spring Even-numbered Years
Introduction to sources of earthquakes; source mechanism and source parameters; attenuation relationships; earthquake response of single and multi-degree of freedom systems; earthquake response spectra and earthquake-induced liquefaction and densification of soil. ***Prerequisites: CE F326.*** (3+0)

CE F424 **Introduction to Permafrost Engineering**
3 Credits Offered Spring Odd-numbered Years
Introduction to permafrost and frozen ground engineering, types of permafrost and ways of its formations, factors important for permafrost existence, hazards related to permafrost, index, thermal, and mechanical properties of frozen and thawing soils, methods of thermal analysis of soil freezing and thawing, foundations design alternatives, pipelines, roads and airfields in the permafrost region. ***Prerequisites: CE F326; or permission of instructor. Recommended: CE F422; GE F384.*** (3+0)

CE F425 **Advanced Soil Mechanics**
3 Credits Offered as Demand Warrants
Soil formation, identification and classification, physical and mechanical properties of soil, seepage, drainage and frost action, subsoil investigation, bearing capacity of soils, and lateral earth pressures and stability of slopes. Special fees apply. ***Prerequisites: CE F326; ES F301.*** (2+3)

CE F432 **Steel Design**
3 Credits Offered Fall
Design philosophies and current practice related to steel design are covered. Describes how the understanding modes of failure are used to design structural members with an appropriate factor of safety to satisfy strength and serviceability (performance). Tension members, fasteners, welds, column buckling, beam behavior and beam-columns will be discussed. The current AISC specifications are used. Special fees apply. ***Prerequisites: CE F331; ES F331.*** (2+3)

CE F433 **Reinforced Concrete Design**
3 Credits Offered Fall
Behavior of reinforced concrete members. Design philosophies and current practices. Flexural members, to include: rectangular, T-beams and one-way slabs. Crack control, anchorage, development lengths and deflections. Axially loaded members. Laboratory experiments. Current ACI 318 Code used. Special fees apply. ***Prerequisites: CE F331; ES F331.*** (2+3)

CE F434 **Timber Design**
3 Credits Offered as Demand Warrants
Design loads. Building systems and loading path. Physical and mechanical properties of wood. Design values and adjustment factors. Design of axial members, beams and columns. Connection details. Design of wood frame structures. Current National Design Specifications (NDS) for Wood Construction used. Special fees apply. ***Prerequisites: CE F331; ES F331.*** (2+3)

CE F435 **Design and Construction of Bridges**
3 Credits Offered Spring
Design-build technology for bridge structures is introduced. A bridge system is developed for a given crossing with predetermined specifications. Alternate designs are developed. These alternatives are based on design calculations, prepared drawings and suitability. Design ideas are developed and tested to verify if the idea meets the design assumptions. Techniques in design, fabrication, fund raising, project management, fiscal responsibility, safety, public speaking and teamwork are learned and used during the semester. The final structure will be load tested and graded based on meeting the goals of the specification. ***Prerequisites: Permission of instructor. Recommended: CE F432.*** (1+6)

CE F438 W,O **Design of Engineered Systems**
3 Credits Offered Spring
System design principles for large-scale constructed facilities. Application of ethics, liability and legal principles to professional practice. Emphasis on teamwork and leadership. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; CE F405 or CE F422 or CE F432 or CE F433 or CE F434 or CE F442 or CE F445; last year of civil engineering B.S. program.*** (3+0)

CE F442 **Environmental Engineering Design**
3 Credits Offered Fall
Design of pollution control and remediation systems. Theories and principles for the design of engineering systems for environmental protection, management and control. Water and wastewater treatment and solid waste management. Special fees apply. ***Prerequisites: CE F341.*** (3+0)

CE F445 **Hydrologic Analysis and Design**
3 Credits Offered Spring
Design and analysis; extended coverage of hydrologic concepts from CE F344. Precipitation, snow cover and evaporation analysis; groundwater hydraulics; runoff analysis and prediction; statistical hydrology; application of simulation models. Design of structures such as culverts, reservoirs, wells, pumps and pipe networks. ***Prerequisites: CE F344.*** (2+3)

CE F451 **Construction Cost Estimating and Bid Preparation**
3 Credits Offered Fall
Compilation and analysis of the many items that influence and contribute to the cost of projects to be constructed. Preparation of cost proposals and study of bidding procedures. ***Recommended: College math.*** (3+0)

CE F470 **Civil Engineering Internship**
1 Credit
Supervised work experience in engineering organizations. Assignments individually arranged with cooperating organizations and agencies. Course may be repeated three times. Each repeat must be for a different type of project. As part of the requirements for earning credit, the student must have a letter of release of information from the company, prepare a written report and make an oral presentation. Program must be approved in advance by the department. ***Prerequisites: Upper division standing; permission of department coordinator.*** (0+3)

CE F490 **Civil Engineering Seminar**
0.5 Credit Offered Fall
CE 490-491, together, constitute the standard one-year engineering seminar. The class is designed to provide the student with exposure to the latest information available from researchers and practicing professionals in industry. Graded Pass/Fail. ***Prerequisites: Junior/senior standing.*** (0.5+0)

CE F491 **Civil Engineering Seminar**
0.5 Credit Offered Spring
CE 490-491, together, constitute the standard one-year engineering seminar. The class is designed to provide the student with exposure to the latest information available from researchers and practicing professionals in industry. Graded Pass/Fail. ***Prerequisites: Junior/senior standing.*** (0.5+0)

CE F603 **Arctic Engineering**
3 Credits
Application of engineering fundamentals to problems of advancing civilization to polar regions. Logistics, foundations on frozen ground and ice thermal aspects of structures, materials, transport and communications, and heat-

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ing and ventilating. Special fees apply. ***Recommended: Senior standing or B.S. degree in engineering; or permission of instructor.*** (3+0)

CE F605 **Pavement Design**
3 Credits Offered Spring Odd-numbered Years
Current design techniques for flexible and rigid pavements. Materials characterization, loading considerations, empirical design methods, mechanistic design methods and rehabilitation. ***Recommended: CE F402; graduate standing; or permission of instructor.*** (3+0)

CE F617 **Control Surveys**
3 Credits Offered as Demand Warrants
Geodetic surveying, where the shape of the earth must be considered. Forward and inverse geodetic problems. Medium to long electronic distance measurements. Heavy emphasis on Alaska State Plane Coordinate System (NAD 83) and UTM Coordinate System. Adjustment of level nets. ***Prerequisites: CE F415 or other surveying experience acceptable to instructor.*** (3+0)

CE F620 **Construction Project Management**
3 Credits Offered Fall Even-numbered Years
Construction equipment, methods, planning and scheduling, construction contracts, management and accounting, construction estimates, costs, and project control. ***Recommended: ESM F450 or equivalent.*** (3+0)

CE F622 **Foundations and Retaining Structures**
3 Credits Offered as Demand Warrants
Advanced study of shallow and deep foundations; analyses and design of retaining walls, free-standing sheet-pile walls, braced excavations, slurry walls, tied-back retention systems, reinforced earth, frozen soil walls, anchored bulkheads, and cellular cofferdams. ***Prerequisites: CE F422 or permission of instructor.*** (3+0)

CE F625 **Soil Stabilization and Embankment Design**
3 Credits Offered Fall Even-numbered Years
Soil and site improvement using deep and shallow compaction, additives, preloading, vertical and horizontal drains, electro-osmosis and soil reinforcement, dewatering and stabilization; embankment design, earth pressure theories and pressure in embankment, embankment stability, embankment construction, control and instrumentation. ***Prerequisites: CE F422 or permission of instructor.*** (3+0)

CE F626 **Thermal Geotechnics**
3 Credits Offered as Demand Warrants
Fundamentals of thermal regimes of soils and rocks. Thermal impact of structures on soils. Thawing of permafrost beneath roads, buildings and around pipelines. Natural and artificial freezing of soils. Engineering means to maintain thermal regime of soils. Thermal design considerations. ***Prerequisites: CE F326; CE F422; CE F425; or permission of instructor.*** Cross-listed with GE F626. (3+0)

CE F627 **Geotechnical Earthquake Engineering**
3 Credits Offered Spring Odd-numbered Years
Introduction to soil dynamics and geotechnical aspects of earthquakes; influences of soils on ground motion, determination of soil response under strong seismic motion, causes of soil failures, soil liquefaction, lateral spreading, the seismic response of earth structures, and seismic-deformation procedures for slopes. ***Prerequisites: CE F326 or permission of instructor.*** (3+0)

CE F628 **Unsaturated Soils Mechanics**
3 Credits Offered as Demand Warrants
Fundamentals of soil behavior under load; pore pressure during monotonic loading; Ladd's "Simple Clay" model; densification and drained cyclic loading of sand; undrained cycle loading of soil. ***Prerequisites: CE F326.*** (3+0)

CE F630 **Advanced Structural Mechanics**
3 Credits Offered as Demand Warrants
Shear and torsion, nonsymmetrical bending, shear center, curved beams, introduction to composite material mechanics, application in bridge engineering. ***Prerequisites: Math F302; ES F331. Recommended: Graduate standing in engineering.*** (3+0)

CE F631 **Advanced Structural Analysis**
3 Credits Offered Spring Odd-numbered Years
Derivation of the basic equations governing linear structural systems. Application of stiffness and flexibility methods to trusses and frames. Solution techniques utilizing digital computers. Planar structures and space structures (trusses and frames) will be covered. Both exact and approximate solution techniques will be reviewed. ***Prerequisites: CE F331 or permission of instructor.*** (3+0)

CE F633 **Theory of Elastic Stability**
3 Credits Offered Spring Odd-numbered Years
The theory and implementation of the buckling of slender elements will be covered. Both lateral and local buckling concepts will be discussed. Emphasis will be placed on developing the ability to evaluate if a member is likely to buckle. The course will cover elastic and inelastic buckling of columns. Other topics include lateral torsional buckling of beams, potential buckling of beam-columns and rigid frame members and the buckling of non standard shapes. ***Prerequisites: CE F331; CE F432; MATH F302.*** (3+0)

CE F634 **Structural Dynamics**
3 Credits Offered as Demand Warrants
This course covers the theory of structural dynamics. Subjects include equations of motion for un-damped single and multiple degree of freedom systems. Free vibration and response to harmonic and periodic excitations will be studied. Response to arbitrary, step and pulse type excitations are studied in preparation for a study of earthquake type loading. The basic concepts related to the interaction of a structure to an earthquake event will be discussed. ***Prerequisites: ES F210; CE F331; MATH F302.*** (3+0)

CE F635 **Numerical Methods for Geo-Mechanics and Soil-Structure Interaction**
3 Credits Offered as Demand Warrants
Applications of numerical methods for problems involving seepage, consolidation, foundation on expansive soils and pile installation. Finite difference and element methods, non-linear analysis techniques, elasto-plastic formulation with a tangent stiffness approach, seepage analysis, flow-deformation, coupled analysis, models for soil-structure interaction, solution accuracy and reliability. ***Prerequisites: CE F326; graduate standing; or permission of instructor. Recommended: MATH F302.*** (3+0)

CE F637 **Earthquakes: Seismic Response of Structures**
3 Credits Offered as Demand Warrants
Fundamentals of structural earthquake engineering: strong ground motion phenomena; dynamic analysis of structural systems for seismic motion; response spectrum and time history methods, design of structural systems for lateral forces; shearwalls and diaphragms; moment-resistive frames, braced frames; current design criteria and practice; connection details, serviceability requirement; story drift, non-structural building elements; soil-structure interaction. ***Prerequisites: ES F210 or permission of instructor.*** (3+0)

CE F640 **Prestressed Concrete**
3 Credits Offered as Demand Warrants
Theory and practice of prestressed concrete design. Pre-tensioning and post-tensioning. Anchorage of steel. Materials, design specifications. Application in bridges, tanks and slabs. ***Prerequisites: CE F331; CE F433. Recommended: Graduate standing.*** (3+0)

CE F646 **Structural Composites**
3 Credits Offered as Demand Warrants
The basics of structural composite theory. Basic design procedures related to structural composite members and the structural analysis of members made of various materials to create laminates or sandwich panels will be covered. ***Prerequisites: ES F331; CE F331 or permission of instructor.*** (3+0)

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CE F650 **Bridge Engineering**
3 Credits Offered as Demand Warrants
Covers structural systems, loading and analysis by influence lines. Slab and girder bridges considering composite design, prestressed and concrete bridges and how these bridges are designed and rated using AASHTO specifications. ***Prerequisites: CE F432; CE F433; or permission of instructor.*** (3+0)

CE F661 **Advanced Water Resources Engineering**
3 Credits Offered Spring Odd-numbered Years
Engineering hydraulics and hydrology including use of standard computer models to solve water resource engineering problems. Saint Venant shallow water equations. Introduction to perturbation method. ***Recommended: Permission of instructor.*** (3+0)

CE F662 **Open Channel and River Engineering**
3 Credits Offered Spring Even-numbered Years
Principles of open channel flow, specific energy, hydraulic jump, transitions and controls, uniform and non-uniform flows, steady and unsteady flows, numerical solution for unsteady flows. River engineering, stream channel mechanics, and mechanics of sedimentation. ***Recommended: Permission of instructor.*** (3+0)

CE F663 **Groundwater Dynamics**
3 Credits Offered Fall Even-numbered Years
Fundamentals of geohydrology, hydraulics of flow through porous media, well hydraulics, groundwater pollution, and groundwater resources development. ***Recommended: Permission of instructor.*** (3+0)

CE F664 **Sediment Transport**
3 Credits Offered Spring Even-numbered Years
Fundamentals of sediment transport processes in rivers, oceans and reservoirs. Bed-load and suspended-load transports. Mechanics of turbidity currents. Reservoir sedimentation. Numerical modeling. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

CE F676 **Coastal Engineering**
3 Credits Offered as Demand Warrants
Review of deep and shallow water waves, littoral drift, coastal structures, pollution problems and harbor seiches. ***Prerequisites: ES F341.*** (3+0)

CE F681 **Frozen Ground Engineering**
3 Credits Offered Fall Odd-numbered Years
Nature of frozen ground, thermal properties of frozen soils, classification, physical and mechanical properties of frozen soils, subsurface investigation of frozen ground, thaw settlement and thaw consolidation, slope stability and principles of foundation design in frozen ground. ***Prerequisites: Training or experience in soil mechanics.*** (3+0)

CE F682 **Ice Engineering**
3 Credits Offered Spring Odd-numbered Years
The factors governing design of marine structures, which must contend with the presence of ice. Topics include ice growth, ice structure, mechanical properties and their dependence on temperature and structure, creep and fracture, mechanics of ice sheets, forces on structures, and experimental methods. ***Prerequisites: ES F331, MATH F202X, training or experience in soil mechanics.*** (3+0)

CE F683 **Arctic Hydrology and Hydraulic Engineering**
3 Credits Offered Fall Odd-numbered Years
Aspects of hydrology and hydraulics unique to engineering problems of the north. Although the emphasis will be on Alaskan conditions, information from Canada and other circumpolar countries will be included in the course. ***Prerequisites: CE F344 or equivalent.*** (3+0)

CE F684 **Arctic Utility Distribution**
3 Credits Offered Spring Even-numbered Years
Practices and considerations of utility distribution in Arctic regions. Emphasis on proper design to include freeze protection, materials, energy conservation and system selection. ***Prerequisites: ES F341 or permission of instructor.*** (3+0)

CE F685 **Topics in Frozen Ground Engineering**
3 Credits Offered as Demand Warrants
Selected frozen ground foundation engineering problems will be explored in depth including refrigerated foundations and pile foundations. ***Prerequisites: CE F681.*** (3+0)

COMMUNICATION

Note: Due to enrollment pressures, it is Department of Communication policy to drop students from the class roll who fail to attend either of the first two meetings of a basic course (COMM F131X and COMM F141X) even if they have preregistered. Prerequisite for all F600-level communication courses is admission to the M.A. degree Professional Communication program or permission of instructor.

COMM F131X **Fundamentals of Oral Communication: Group Context**
3 Credits
Presentational speaking skills: individual and group. Includes verbal and nonverbal skills, critical thinking in selecting and organizing materials, audience analysis and speaking presentation. Group skills include task and relational interaction, required interdependence, working across cultural differences, group decision-making and shared logistics of presentation. Student evaluations are based on nationally normed speaking competencies. (3+0)

COMM F141X **Fundamentals of Oral Communication: Public Context**
3 Credits
Speaking skills for individual presentation. Includes verbal and nonverbal skills, critical thinking in selecting and organizing materials, audience analysis, informative and persuasive speaking, and actual presentations. Student evaluations are based on nationally normed speaking competencies. (3+0)

COMM F180 **Introduction to Human Communication** (s)
3 Credits Offered Spring
Critical thinking about fundamental concepts in human communication in interpersonal, group, public, organizational and intercultural settings. Introduction to inquiry into human communication as a social and human science. (3+0)

COMM F300X **Communicating Ethics** (h)
3 Credits
An examination of ethical choices which are communicated in everyday encounters. Examines human moral development from a variety of perspectives, including feminist interpretations. Creation and communication of human values explored through the discussion of a series of contemporary dilemmas. Also available through the Center for Distance Education. ***Prerequisites: Junior standing; placement in ENGL F111X or higher; or permission of instructor.*** (3+0)

COMM F320 **Communication and Language** (s)
3 Credits
Examination of the nature of language and its place in human communication, with special attention to the creation of meaning in conversation. ***Prerequisites: Any lower-division communication course or permission of instructor.*** (3+0)

COMM F321 W **Nonverbal Communication** (s)
3 Credits
Non-lexical behavior in human communication, including consideration of space, physical environment, physical appearance and dress, kinesics, facial

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expression and non-lexical vocal behavior. ***Prerequisites: Any lower division communication course; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (3+0)

COMM F322 W **Communication in Interpersonal Relationships** (s)
3 Credits
An examination of communication in the most basic human context, the relational dyad. Emphasis on the ongoing, co-construction of the relationship as communicative action. Discussion of interpersonal relationships generally, and extensive discussion of communication in the patterns of coming together, relationship maintenance, relational and personal growth in relationships, relational conflict, and relational disengagement. Theoretical and practical perspectives. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (3+0)

COMM F330 **Intercultural Communication** (s)
3 Credits Offered Spring
The nature and sources of problems in communication that may arise when persons with different cultural backgrounds interact. Emphasis on problems in intercultural communication in Alaska. ***Prerequisites: Any lower-division communication course or permission of instructor.*** (3+0)

COMM F331 O **Advanced Group Communication** (s)
3 Credits
Current research and theory in intergroup and intragroup relations. Topics include the study of leadership, power, group structure, participation and conflict. ***Prerequisites: COMM F131X or COMM F141X; any lower-division communication course; or permission of instructor.*** (3+0)

COMM F335 O **Organizational Communication** (s)
3 Credits
Examines current theoretical and methodological approaches undergirding the construction of organizations via the communication process. Includes functional (message flow, load and network analysis) as well as interpretive (metaphors, narratives and organizational culture) approaches to the study of organizational communication. ***Prerequisites: COMM F131X or COMM F141X; any lower-division communication course; or permission of instructor.*** (3+0)

COMM F351 **Gender and Communication** (s)
3 Credits Offered Fall
Basic socialization differences exist in the communication practices of women and men in every culture, resulting in differing cultural constructions of male and female gender. Those differences are addressed in the interpersonal, organizational and cultural contexts. Exploration of cultural female/male dichotomy as well as individual similarities. ***Prerequisites: Any lower-division communication course or permission of instructor.*** Cross-listed with WMS F351. (3+0)

COMM F352 **Family Communication** (s)
3 Credits
Exploration of the functions of communication in marriage and the family, sequences and patterns of family communication, family communication as a continual process of coping with dialectical tensions, and the complexity of changing family life in Western societies. ***Prerequisites: Any lower-division communication course or permission of instructor. Recommended: COMM F322.*** (3+0)

COMM F353 **Conflict, Mediation, and Communication** (s)
3 Credits
Examines conflict as a complex communication event, together with the role of the mediator in building constructive outcomes in conflicts. Emphasis on developing skills to engage in mediation. ***Prerequisites: Any F100-level communication course or permission of instructor.*** (3+0)

COMM F380 **Communication and Diversity** (s)
3 Credits Offered Spring
Provides students with a cognitive and experiential foundation for understanding how the communication process works in the context of diversity. Includes an in-depth examination of those processes and products of processes that lead communicators to devalue differences in one another. (3+0)

COMM F401 **Communication Research Methods** (s)
3 Credits Offered Fall
Quantitative and qualitative research methodologies employed in the conduct of research on communication phenomena. ***Prerequisites: Any F300-level communication course; senior standing; or permission of instructor.*** (3+0)

COMM F425 W **Communication Theory** (s)
3 Credits Offered Spring
Theories of human communication, as well as of the nature of inquiry into human communication phenomena. Issues include the nature of communication as a discipline, critical and scientific inquiry, and major paradigms or perspectives within which communication theories are created. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; any F300-level communication courses; senior standing; or permission of instructor.*** (3+0)

COMM F432 O **Professional Public Speaking**
3 Credits
Professional clear effective speaking. Uses evaluation criteria and assignments to build speaking competencies. Professional preparation for students whose career path includes public speaking. ***Prerequisites: COMM F131X or COMM F141X; senior standing.*** (3+0)

COMM F441 **Persuasion** (s)
3 Credits
Examination of communication situations which involve attempts to modify the beliefs, attitudes, values, intentions or behaviors of another individual or group of individuals. Explores the process, methods and ethics of attempts to affect change via persuasive communication. ***Prerequisites: Any F300-level communication course or permission of instructor.*** (3+0)

COMM F462 W **Communication in Health Contexts** (s)
3 Credits
Health communication as an established context for communication study will be explored. Problems in health communication will be examined as well as how those problems are exacerbated by the various matters of diversity, language and setting. Communication between health care professionals, between health care providers and health care consumers, between health care facilities and communities, and the legal perspectives of health communication will be topical. ***Prerequisites: Any F300-level communication course; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (3+0)

COMM F469 **Communication Internship**
1-3 Credits Offered as Demand Warrants
Links academic and professional on-site learning. Students must arrange an appropriate internship. The internship must be relevant to communication, provide guided learning experiences in a profession that would be appropriate and of interest for employment after graduation, and include a minimum of 150 hours on-site. COMM F469 receives a deferred grade, which will then be completed following (or concurrent) fall semester when the student enrolls in COMM F470. Evaluation will be done by both site supervisor and course instructor, and the grade assigned will apply to the credits for both COMM F469 and COMM F470. ***Prerequisites: Junior or senior standing; permission of instructor.*** (0+0+10-30)

COMM F470 **Communication Internship Seminar**
3 Credits Offered as Demand Warrants
Will improve job-hunting and networking skills and apply organizational communication theories (workplace socialization processes, cultural rituals, negotiation of power, social capital, emotional labor, etc.). COMM F469 receives a deferred grade, which will then be completed following (or concurrent) fall semester when the student enrolls in COMM F470. Evaluation will be done by both site supervisor and course instructor, and the grade assigned will apply to the credits for both COMM F469 and COMM F470. ***Prerequisites: COMM F469; junior or senior standing; permission of instructor.*** (3+0)

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COMM F475 W **Applied Communication in Training and Development** (s)
3 Credits
Applies communication theory and research to organizational settings. Includes the identification and assessment of problems and opportunities that would benefit from the application of communication interventions including training, development and transformation technologies. ***Prerequisites: Any F300-level communication course; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (3+0)

COMM F482 W,O **Capstone Seminar in Communication** (s)
3 Credits Offered Spring
Original research to demonstrate ability to read and understand social research, synthesize information, formalize a research question and use research skills. This senior capstone course requires a research project presented in a public speaking forum. ***Prerequisites: COMM F131X or COMM F141X; COMM F401; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (3+0)

COMM F600 **Introduction to Professional Communication**
3 Credits Offered Fall
An introduction to professional practices important to communication careers. Professional writing and editing methods and techniques used in academic and/or professional careers. Development and presentation of professional reports which would include quantitatively- and qualitatively-based support. A.P.A. style guide will be covered. ***Prerequisites: Enrollment in M.A. in Professional Communication or permission of instructor.*** (3+0)

COMM F601 **Communication Research Methodologies: Social Science**
3 Credits Offered Fall
Introduction to the range of methodologies used to produce both practical and theoretic knowledge in the discipline. Presents the relationships between scientific questions, appropriate selection of methodology and types of knowledge products. ***Note: COMM/JRN F601 is a required core course for the M.A. in Professional Communication.*** Cross-listed with JRN F601. (3+0)

COMM F602 **Communication Research Methodologies: Human Science**
3 Credits Offered Spring
An introduction to research using a constructionist epistemology and the methodologies of the human science contexture. Includes evaluation and preparation of research using a variety of methodologies and to employ the data collection techniques that are implied by those methodologies. ***Prerequisites: COMM F601; COMM F625; or permission of the instructor.*** (3+0)

COMM F622 **Interpersonal Interaction**
3 Credits
All understandings of communication study begin at the interpersonal level because this is the context in which the relation of self and the social is most clear. Interpersonal Interaction will provide students an opportunity to investigate a particular communication context of their choice (health, family, aging, conflict, relational, education, etc.) and ways in which interpersonal interactions interconnect human social life at all levels of lived experience. ***Prerequisites: Enrollment in M.A. in Professional Communication degree or permission of instructor.*** (3+0)

COMM F625 **Communication Theory**
3 Credits Offered Fall
Required course for the master's degree in Professional Communication. The course is designed to acquaint students with both the historical evolution of the discipline against the backdrop of the evolution of the social sciences and with the theoretical perspectives of knowledge-building that have marked that disciplinary evolution. Students will learn the contextual interconnectedness of philosophy and theory. Finally, Communication Theory will also make the essential connections between theoretical perspectives and their professional uses. Cross-listed with JRN F625. (3+0)

COMM F631 **Teambuilding**
3 Credits Offered as Demand Warrants
Small group communication theory and methods linked to professional applications. Ways to create, maintain and reward productive work teams. Face-to-face and mediated group sessions will be discussed as well as the impact of professional work groups on organizational teambuilding. Students will work with teambuilding interventions that they will be able to apply in a variety of organizational settings. ***Prerequisites: COMM F600. Recommended: COMM F625.*** (3+0)

COMM F635 **Organizational Culture and Communication**
3 Credits
Contemporary perspectives on communication in the organizational context. The interpretive paradigm will be examined in terms of the broad range of knowledge currently being generated by communication scholars and other professionals who are looking more closely at the ways communication produces the social contexts in which it occurs. Human organizations and their transparency to the communication of their members is the pragmatic substance of the course. ***Prerequisites: Enrollment in M.A. in Professional Communication degree or permission of instructor.*** (3+0)

COMM F642 **Health Communication**
3 Credits Offered as Demand Warrants
Health Communication is intended to give students and interested professionals in related fields access to the most current research in this area. The course will address human communication at every level of interaction in the provision of health care: interpersonal (e.g., doctor/ patient), small group (e.g., clinic cardiac team), intra-organizational (e.g., medical staff and business staff), inter-organizational (e.g., hospital and schools), public campaigns (e.g., Center for Disease Control and prevention initiatives on drunk driving), and associated communication factors such as culture and diversity. Includes involvement in research and grant-proposal writing. ***Prerequisites: Enrollment in M.A. in Professional Communication degree or permission of instructor.*** (3+0)

COMM F661 **Mentored Teaching in Communication**
1 Credit
Mentored teaching provides consistent contact on course-related issues between teaching assistants and mentoring faculty. Graded Pass/Fail. ***Prerequisites: Enrollment in M.A. of Professional Communication or permission of instructor; award of teaching assistantship in communication. Note: Teaching assistants are required to be enrolled in a mentoring teaching section while teaching. May be repeated up to four times for credit.*** (1+0+2)

COMM F675 **Training and Development Communication**
3 Credits Offered Spring
Training and Development Communication offers students practical, current understandings of planned training, development and transformation processes as they are applied in the organizational setting. The information and class projects will help prepare training and development specialists, consultants and others whose interest is in this growing communication field. ***Prerequisites: Enrollment in M.A. in Professional Communication degree or permission of instructor.*** (3+0)

COMM F680 **Communication and Diversity in the Professional World**
3 Credits Offered Spring
Case study methods applied to the ever-expanding problems of communication in a changing workplace. The diversity of gender, race, ethnicity, nationality, physical ability, sexual orientation and age are reshaping the professional world at every level and communication professionals are increasingly called upon to formulate ways of accommodating this change. The course will prepare students to address diversity and planned changes in the workplace. ***Prerequisites: Enrollment in M.A. in Professional Communication degree or permission of instructor.*** (3+0)

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COMM F682 **Seminar in Communication**
3 Credits Offered as Demand Warrants
A variable content seminar intended to give students an opportunity to work closely with communication faculty in the study of topics, ideas or methodologies significant to the communication discipline (e.g., relational conflict, social construction, narrative research, etc.). ***Prerequisites: Enrollment in M.A. in Professional Communication degree or permission of instructor.*** (3+0)

COMM F699 **Thesis**
1-9 Credits
Every candidate for the communication concentration of the master's degree in professional communication will complete a thesis project. The requirement consists of an original piece of communication research directed by a member of the graduate faculty in the communication department. The completed and accepted thesis will be presented in an appropriate public forum. Graded Pass/Fail. (0+0)

COMMUNITY HEALTH

CHP F082 **Community Health Aide — Pre-session I**
1-3 Credits Offered as Demand Warrants
Assists the newly employed Community Health Aide to function in the village clinic until he/she enters Session I. Patient evaluation, use of the manual, reporting patients, medicines and lab tests. Emergency care is included if students have not had emergency trauma training. ***Prerequisites: Employment by the health corporation as a community health aide or permission of instructor.*** (1-3+0)

CHP F131 **Community Health Aide — Session I**
8 Credits Offered as Demand Warrants
Introduction to providing village primary health care services with remote supervision of a physician. Topics include CHP standard of care, use of the CHA/P Manual, history-taking and physical exam, lab tests, reporting to the physician, medical charting and medication administration. Supervised clinical experiences prepare the student to conduct patient evaluation of common village health problems of children and adults. Introduction to human anatomy and function, wellness and disease concepts, crisis intervention and emergency care. A 200-hour field component at the students' village clinic follows the didactic program. Graded Pass/Fail. ***Prerequisites: Employed as CHA by a health corporation or permission of the instructor.*** (8+0)

CHP F132 **Community Health Aide — Session II**
8 Credits Offered as Demand Warrants
Reinforces problem-oriented patient encounter process. Includes patient education, introduction to prenatal and well child care, sexually transmitted diseases, HIV, substance abuse, mental illness and death and dying issues. Session I material and emergency care are reinforced and expanded upon. Includes 200-hour field component at the student's village clinic. Graded Pass/Fail. ***Prerequisites: CHP F131.*** (8+0)

CHP F133 **Community Health Aide — Session III**
8 Credits Offered as Demand Warrants
Session II content reinforced and expanded upon. Additional topics include prenatal care, family planning, fetal alcohol syndrome, emergency delivery techniques, newborn and well child care including immunizations, nutrition, dental health, adult health surveillance, family violence and sexual abuse/rape and clinic management. A 200-hour field component at the students' village clinic follows the didactic program. Graded Pass/Fail. ***Prerequisites: CHP F132.*** (8+0)

CHP F134 **Community Health Aide — Session IV**
8 Credits Offered as Demand Warrants
Common patient problems within the body systems are reviewed with a focus on assessment skills and management plans. Previous session content is reviewed. Follow-up care for patients with chronic illness, injury prevention, tuberculosis, cancer, environmental health, post partum care, adolescent care and older adult/elder care. A 200-hour field component at the students' village clinic follows the didactic program. Graded Pass/Fail. ***Prerequisites: CHP F133.*** (8+0)

CHP F135 **Community Health Aide Preceptorship**
2 Credits Offered as Demand Warrants
Supervised primary care clinical experience. Minimum of 30 contact hours of direct patient care required. Students provide patient care in a variety of clinical settings including outpatient (acute and emergency care), prenatal, well child and chronic care clinics. Additional experiences are scheduled with the referral center (hospital) departments. Graded Pass/Fail. ***Prerequisites: CHP F134.*** (2+0)

CHP F203 **Clinical Update for Community Health Practitioners**
1-3 Credits Offered as Demand Warrants
Review, update and reinforcement of knowledge and skills taught in CHP F131, CHP F132, CHP F133 and CHP F134. Emphasis is on patient evaluation skills, use of the manual, patient treatment plan, medicines, prenatal care, well-child care, chronic patient care and emergency care. Clinical training is provided. ***Prerequisites: CHP F134.*** (1-3+0)

CHP F206 **Mental Health and Substance Abuse**
1-3 Credits Offered as Demand Warrants
Instruction in listening skills, drug therapy and family dynamics for crisis intervention, long term care in the area of mental health and substance abuse. Other topics include the mentally ill patient, the substance abuser, the co-dependent and prevention activities for the village. ***Prerequisites: CHP F134 or permission of instructor.*** (1-3+0)

CHP F207 **Maternal and Infant Health**
1-3 Credits Offered as Demand Warrants
Review of the anatomy of the reproductive system, family planning, pregnancy, fetal development, prenatal care, prenatal education, emergency delivery, post-partum care for mother and baby, and well-child evaluations and immunizations. ***Prerequisites: CHP F134 or permission of instructor.*** (1-3+0)

CHP F208 **Communicable Diseases**
1-3 Credits Offered as Demand Warrants
Expands concepts in relation to diagnosis, management and prevention of sexually transmitted diseases. Skills taught include male and female genitalia exam, pelvic exam, pap smear, gonorrhea culture and chlamydia culture. Prevention and patient education are emphasized. ***Prerequisites: CHP F134 or permission of instructor.*** (1-3+0)

CHP F210 **CHAM Use and Documentation**
1 Credit
Review and explore many types of patient encounters encompassed by the scope of practice of the Alaska Community Health Aide/Practitioner (CHA/P). Focus is on professional standard of care issues and provision of competent and legal documentation of patient encounters. Emphasis on proper use of the Alaska Community Health Aide/Practitioner (CHAM) to conduct and document the encounter and its legal significance. ***Prerequisites: CHP F131; CHP F132. Special restrictions: Employed as a Community Health Aide by a Native Tribal Health Organization.*** (0+0+32)

CHP F211 **Health Education**
1-3 Credits Offered as Demand Warrants
Methods and philosophy of health education, use and sources of audiovisual materials, presentation planning and participation in school and community health programs are included. A variety of teaching methods including role playing for individual and group presentations permit CHPs to practice their health education knowledge and skills. (1-3+0)

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CHP F212 **Diabetes: Primary Prevention and Village Medical Care**
1-3 Credits Offered as Demand Warrants
Pathophysiology, primary prevention and follow-up treatment of the disease diabetes. Topics include the problem of Type II diabetes in rural Alaska, CHP role in the village health care system, Type I and Type II diabetes, primary prevention of Type II diabetes, village medical care and referral, patient education, emergency care and diabetes medications. The clinical training portion of the course is available for Community Health Aides/Practitioners only. (1-3+0)

CHP F214 **Cancer: Risks, Diagnosis and Treatment**
3 Credits Offered Spring, As Demand Warrants
Causes and facts about cancer in the Alaska Native population. Includes cancer risk factors, healthy lifestyle behaviors and the importance of early screening. Presents cancer diagnosis and treatment. Explores pain management, loss and grief. Includes self-care, stress and burnout issues for family and caregivers. ***Recommended: CHP F134.*** (3+0)

CHP F215 **Death and Dying**
3 Credits Offered as Demand Warrants
Focusing on contemporary primary care issues relating to death and dying. Improving individual coping skills in loss and grief situations. Topics include theories of grief and loss, care of the terminally ill patient, suicide, euthanasia, traumatic death and neonatal death. Cultural perspectives on dying, body preparation, burial rites, advanced directives, death certificates and legal issues reviewed. (3+0)

CHP F220 **Women's Health: Breast and Cervical Cancer Screening**
2 Credits Offered as Demand Warrants
Review of anatomy, physiology and pathophysiology of the female breasts and genitals, with reinforcement of identification of risk factors as they relate to the development of breast and cervical cancer. Skills taught include female breast and genital history taking, examination to include Pap, chlamydia and gonorrhea specimen collection, development of appropriate assessments and plans. Areas emphasized: prevention and/or early detection. ***Prerequisites: CHP F134 or permission of instructor.*** (2+0)

CHP F250 **Current Issues in Rural Health Care**
1-3 Credits Offered as Demand Warrants
Selected current issues in medical education intended for, but not limited to, community health aides/practitioners with emphasis on expanding concepts relating to understanding, diagnosis and management of illnesses common to rural Alaskan communities. May be repeated for credit. Community Health majors may apply up to a maximum of three credits towards the F200-level major specialty requirements for A.A.S. degree. Graded Pass/Fail. (1-3+0)

COMPUTER AND INFORMATION TECHNOLOGY SYSTEMS

CITS F201 **Microcomputer Operating Systems Support**
1-3 Credits Offered as Demand Warrants
Comprehensive exploration of a current microcomputer operating system: use, configuring, installing and administering. Topics include end-user and technical support. Also offered Pass/Fail as CITS F201P. ***Recommended: CIOS F128 or equivalent skills.*** (1-3+0)

CITS F202 **Microcomputer Hardware Support**
1-3 Credits Offered as Demand Warrants
Fundamental hardware and software (associated with hardware) configuration and troubleshooting. Includes installing, removing and configuring computer hardware components; installing and configuring software applications and operating systems to support hardware; diagnosing hardware and software problems; and developing troubleshooting and configuration procedures. ***Recommended: CITS F201 or equivalent skills.*** (1-3+0)

CITS F203 **Information Technology Support Fundamentals**
4 Credits Offered as Demand Warrants
Overview of skills and knowledge required by professional computer support technicians to support and troubleshoot computer operating systems and computer hardware, including the purpose and function of the internal components of a computer, how to assemble a computer system, install an operating system and the basic skills and knowledge required to connect to and share resources in a network environment. ***Recommended: CIOS F128 or equivalent skills.*** (4+0)

CITS F204 **Introduction to Network Support and Administration**
3 Credits Offered as Demand Warrants
Features and functions of networking components and the knowledge and skills needed to install, configure and troubleshoot basic networking hardware, protocols and services. Develop technical ability in the areas of media and topologies, protocols and standards, network implementation and basic network administration and support. ***Recommended: CITS F201; CITS F202; or equivalent skills.*** (3+0)

CITS F205 **Introduction to Microcomputer Programming**
1-3 Credits Offered as Demand Warrants
Microcomputer programming focused on programming concepts for applications, operating systems and web technologies. Supplementing and integrating computer applications with built-in programming tools. ***Recommended: CIOS F130; CIOS F135; CIOS F240; CITS F201 or equivalent skills.*** (1-3+0)

CITS F212 **Server Operating Systems**
3 Credits Offered as Demand Warrants
Fundamentals in installing, configuring and maintaining server operating systems. Learn how to configure and administer network accounts, resources, and common services deployed on server operating systems. ***Prerequisite: CITS F201; CITS F202; or CITS F203 or permission of instructor. Recommended: CITS F204; or F241; or equivalent skills.*** (3+0)

CITS F219 **Microcomputer Operating Systems: Topics**
1-4 Credits Offered as Demand Warrants
In-depth and comprehensive technical class covering operating system skills and concepts. Course may be repeated for credit. Special fees apply. ***Prerequisites: CITS F201 or equivalent skills.*** (1-4+0)

CITS F220 **Implementing Internet Tools and Technologies**
3 Credits Offered as Demand Warrants
Exploration of advanced Internet topics. Building a presence on the Internet — evaluate web hosting services, domain names and registration services. How to implement and understand web communication tools and develop and understand the impact of participating in social networks and the changing nature of these networks. ***Recommended: CIOS F146 or equivalent skills.*** (3+0)

CITS F221 **Graphics and Multimedia for the Web**
3 Credits Offered as Demand Warrants
Creating graphics and multimedia content for the Web. Graphic topics include formats, size and resolution, optimization and design fundamentals. Multimedia topics include animation, interactivity and combining sound, speech, graphics, photographs and video. ***Recommended: CIOS F150; or equivalent skills.*** (3+0)

CITS F222 **Internet Authoring and Design**
1-3 Credits Offered as Demand Warrants
Comprehensive survey of a professional authoring tool to create documents for effective distribution through the Internet. Includes design and preparation of documents for electronic distribution. Also available through the Center for Distance Education. ***Recommended: CIOS F146 and CIOS F150 or equivalent computer literacy including saving/retrieving files, use of office applications, Internet and e-mail.*** (1-3+0)

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CITS F224 **Web Scripting**
3 Credits Offered as Demand Warrants
Introduction to client-side Web page scripting. Covers basic programming concepts, including data representation, functions, control structures and arrays. Topics include client-side scripting with JavaScript, object-oriented JavaScript, design issues, error handling, security, the Document Object Model and dynamic HTML and AJAX. ***Prerequisite: CITS F205; or CS F103; F201; or F205; CITS F222; or permission of instructor.*** (3+0)

CITS F225 **Web Databases and Programming**
3 Credits Offered as Demand Warrants
Programming and database design as it relates to creating dynamic web sites and applications. Develop web applications to automate websites, create and access web databases, provide tools for users to modify parts of their own website, show random data, create and access files on the fly and reduce repetitive maintenance. Course topics include CSS, SSI, DHTML, SQL, PHP and other web technologies. ***Recommended: CITS F220; CITS F222; or equivalent skills.*** (3+0)

CITS F228 **Advanced Website Design and Development**
3 Credits Offered as Demand Warrants
Plan and implement professional and comprehensive websites that utilize and integrate multiple website design and development technologies such as XHTML, CCS, XML, Ajax, Web APIs, client-side and server-side programming, graphics and multimedia, and web communication tools. ***Prerequisites: CITS F221; F222; F224; F225; or permission of instructor.*** (3+0)

CITS F240 **System and Network Services Administration**
3 Credits Offered as Demand Warrants
Implement and administer the core network services operating within a network environment. Topics include: DHCP, DNS, remote access, file and print, Web, update and patch management, security and network management services. Develop a conceptual understanding of each network service and learn how to plan, implement and administer each service. ***Prerequisites: CITS F204; or F241; or permission of instructor. Recommended: CITS F212.*** (3+0)

CITS F241 **Networking and LAN Infrastructure Basics**
4 Credits Offered as Demand Warrants
Design and implementation of networks in small- to medium-sized environments. Focuses on network terminology and protocols, local-area networks (LANs), wide-area networks (WANs), open systems interconnection model, cabling, cabling tools, routers, router programming, Ethernet, Internet protocol addressing and network standards. Special fees apply. ***Recommended: CITS F201; CITS F202; or equivalent skills.*** (4+0)

CITS F242 **Routers and Routing Concepts**
4 Credits Offered as Demand Warrants
The skills and knowledge necessary to configure routers, manage router software, configure routing protocols. Troubleshooting internets and implementing IP-based networks. ***Prerequisites: CITS F241 or permission of instructor.*** (4+0)

CITS F243 **Intermediate Networking and LAN Infrastructure**
4 Credits Offered as Demand Warrants
Provide an understanding of the intermediate LAN technologies and protocols used to build hierarchical networks. Learn how to configure and integrate LAN devices and technologies into hierarchical internetworks. Topics include: switch configuration, virtual LANs, spanning tree protocol, and VLAN trunking protocol, inter-VLAN routing, and wireless LANs. ***Prerequisites: CITS F241; or permission of instructor.*** (4+0)

CITS F244 **Advanced Network Infrastructure Services**
4 Credits Offered as Demand Warrants
Provides the skills and knowledge to select and implement advance services used within a network infrastructure. Learn to implement and configure common wide area network (WAN) data link protocols, how to create and implement security policies, access control lists and advanced addressing services. Learn to detect, troubleshoot and correct common network implementation issues. Topics include: WAN technology and terminology, PPP, frame relay, network security, DHCP, NAT, IPv6 and network troubleshooting. ***Prerequisites: CITS F242; CITS F243; or permission of instructor.*** (4+0)

CITS F249 **Networking and Communications: Topics**
1-4 Credits Offered as Demand Warrants
In-depth technical and comprehensive coverage of networking and communications skills and concepts. Note: May be repeated for credit. Special fees apply. ***Recommended: CITS F241 or equivalent skills.*** (1-4+0)

CITS F261 **Computer and Information Security**
3 Credits Offered as Demand Warrants
The fundamental concepts of computer and information security. Course topics include: understanding threats to a computing infrastructure, understanding encryption technologies, securing communications and applications, security policies and responding to incidents. ***Prerequisites: CITS F204; or F241; or permission of instructor.*** (3+0)

CITS F265 **Directory Services Administration**
3 Credits Offered as Demand Warrants
The purpose and components that make up directory services and the role these services plays in storing, organizing and managing information in a network environment. How to create and configure directory service objects to manage access to network resources, to implement and manage group policy objects, and to backup, restore, monitor and troubleshoot directory service related issues. ***Prerequisite: CITS F204; or F241; CITS F212; or permission of instructor. Recommended: CITS F240; or equivalent skills.*** (3+0)

CITS F281 **Computer Technical Support**
1-3 Credits Offered as Demand Warrants
Prepares students to provide technical support to computer users. Skills include: diagnosing problems, researching solutions, meeting user needs, developing training materials, and giving workshops and lessons. Course may be repeated for credit. ***Prerequisites: Comprehensive experience using the Internet.*** (1-3+0)

CITS F282 **IT Troubleshooting Skills**
1-3 Credits Offered as Demand Warrants
Practical IT troubleshooting skills, including hardware, software, networks and operating systems. The course will include practical and useful troubleshooting scenarios. May be repeated for a total of 12 credits. ***Recommended: In-depth knowledge of networks, operating systems, hardware and software.*** (1-3+0)

CITS F284 **Independent Project**
1-3 Credits Offered as Demand Warrants
Student created project or internship that includes learning new skills, applying the skills to significant problems, and demonstrating the results to other computer users. Includes application of learned skills in a professional manner. ***Prerequisites: 12 credits in CITS courses and permission of instructor.*** (1-3+0)

CITS F285 **Cooperative Work Experience**
3 Credits Offered as Demand Warrants
On-the-job training related to occupational objectives. Weekly seminar with coordinator required. ***Prerequisites: 12 credits in CITS courses and permission of instructor.*** (3+0)

CITS F288 **Professional Certification Review**
1-3 Credits Offered as Demand Warrants
Prepares students for national or industry specific certification examination. (1-3+0)

CITS F289 **Information Technology: Special Topics**
1-3 Credits Offered as Demand Warrants
Comprehensive coverage of a specific information technology topic. ***Recommended: CITS F201; CITS F202; CITS F203; or equivalent skills.*** (1-3+0)

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COMPUTER INFORMATION AND OFFICE SYSTEMS

CIOS F100 Introduction to Personal Computers
1 Credit Offered as Demand Warrants
Introduction to basic computer skills including using the mouse and menus, opening and exiting applications, creating basic word processing and spreadsheet files, basic file management, web browsing, e-mail and virus protection. Graded Pass/Fail. (1+0)

CIOS F103 Computer Survey
1-3 Credits Offered as Demand Warrants
An introduction to the world of computers emphasizing microcomputers. Provides computer terminology and how to use computers as a tool to make work easier and to extend the reach of the mind. (1-3+0)

CIOS F128 Using and Configuring PC Operating System
3 Credits Offered as Demand Warrants
How to use, set up, and configure a current PC operating system including basic troubleshooting and maintenance. ***Recommended: CIOS F150 or equivalent computer literacy including saving or retrieving files, use of office applications, Internet and e-mail.*** (3+0)

CIOS F130 Microcomputer Word Processing
1-3 Credits
Comprehensive exploration of topics related to using microcomputer word processors. Includes creating, formatting and revising documents; using proofreading and editing tools; implementing styles; using templates; and customizing the application. ***Recommended: CIOS F150 or equivalent computer literacy including saving/retrieving files, use of office applications, Internet and e-mail.*** (1-3+0)

CIOS F133 Microcomputer Presentation Software
1-3 Credits Offered as Demand Warrants
Designing effective presentations. Includes organizing and designing an effective presentation of information using current microcomputer software. ***Recommended: CIOS F150 or equivalent skills.*** (1-3+0)

CIOS F135 Microcomputer Spreadsheets
1-3 Credits Offered as Demand Warrants
Comprehensive exploration of topics related to using microcomputer spreadsheets. Includes creating, formatting and revising spreadsheets; creating formulas, graphics and charts; and using spreadsheets to organize, analyze and query information. Also available through the Center for Distance Education. ***Recommended: CIOS F150 or equivalent computer literacy including saving/retrieving files, use of office applications, Internet and e-mail.*** (1-3+0)

CIOS F146 Using Internet Tools and Technologies
1-3 Credits Offered as Demand Warrants
Presentation of the Internet. Includes using and configuring current World Wide Web and e-mail, and other communication tools; developing searching strategies; current and future trends; and basic web authoring. Develop a basic understanding of technologies and protocols used on the Internet. Also available through the Center for Distance Education. ***Recommended: Basic computer literacy, including saving and retrieving files and using basic software.*** (1-3+0)

CIOS F150 Computer Business Applications
1-3 Credits Offered as Demand Warrants
Basic introduction to using a computer and office applications. Includes the operating system, how to save/retrieve files; word processing, document creation and formatting; spreadsheets (basic formulas and functions); and the Internet (browsing, searching and e-mail). (Provides basic computer literacy and prepares for CIOS F110; CIOS F130; CIOS F134 and CIOS F146. No previous computer experience is required.) (1-3+0)

CIOS F152 Introduction to Microcomputers in Small Businesses
1-3 Credits Offered as Demand Warrants
Microcomputers used in small business or professional practice by owners or employees. Overview of computers, uses and means of evaluation when purchasing equipment. Does not satisfy certificate or degree requirements. (1-3+0)

CIOS F189 Microcomputer Applications: Topics
1-3 Credits Offered as Demand Warrants
Extensive coverage of a specific microcomputer application. May be repeated for credit. (1-3+0)

CIOS F215 Information Technology Certification I
1-4 Credits Offered as Demand Warrants
In-depth technical and comprehensive coverage of skills required for the first stage of a specific information technology certification. Course may be repeated for different certifications. Special fees apply. ***Prerequisites: Instructor approval.*** (1-4+0)

CIOS F216 Information Technology Certification II
1-4 Credits Offered as Demand Warrants
In-depth technical and comprehensive coverage of skills required for the intermediate stage of a specific information technology certification. Course may be repeated for different certifications. Special fees apply. ***Prerequisites: Instructor approval.*** (1-4+0)

CIOS F217 Information Technology Certification III
1-4 Credits
In-depth technical and comprehensive coverage of skills required for the advanced stage of a specific information technology certification. Course may be repeated for different certifications. Special fees apply. ***Prerequisites: Instructor approval.*** (1-4+0)

CIOS F218 Information Technology Certification IV
1-4 Credits Offered as Demand Warrants
In-depth technical and comprehensive coverage of skills required for a specialized or advanced stage of a specific information technology certification. Course may be repeated for different certifications. ***Prerequisites: Instructor approval.*** (1-4+0)

CIOS F230 Advanced Word Processing
1-3 Credits Offered as Demand Warrants
Advanced concepts of word processing using various software. ***Prerequisites: CIOS F130.*** (1-3+0)

CIOS F231 Introduction to Desktop Publishing
1-2 Credits Offered as Demand Warrants
Entry-level desktop publishing course introducing the chief features of a page layout program. Step-by-step instructions to create at least three simple publications. ***Prerequisites: Previous computer experience.*** (1-2+0)

CIOS F233 Desktop Publishing
1-3 Credits
Publication design and layout using desktop publishing software. Includes integrating text and graphics, page layout design, scanning and basic image editing. Also available through the Center for Distance Education. ***Recommended: CIOS F150 or equivalent computer literacy including saving/retrieving files, use of office applications, Internet and e-mail.*** (1-3+0)

CIOS F234 Advanced Desktop Publishing
1-3 Credits
Utilization of the advanced features of a page layout program to create camera-ready mechanicals for fliers, brochures and newsletters. Exploration of the elements of good design and the requirements for professional publishing. ***Prerequisites: CIOS F233 or permission of instructor.*** (1-3+0)

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CIOS F240 **Microcomputer Databases**
1-3 Credits Offered as Demand Warrants
Comprehensive introduction to microcomputer databases. Includes basic database concepts; how to maintain and update databases; how to build and use queries and forms; and how to build reports. Introduction to database design. Also available through the Center for Distance Education. ***Recommended: CIOS F150; and CIOS F130 or CIOS F135 or equivalent skills.*** (1-3+0)

CIOS F242 **Advanced Databases**
1-3 Credits Offered as Demand Warrants
In-depth, technical and comprehensive coverage of varied database skills and concepts. Course may be repeated for credit. ***Requirements: CIOS F240 or equivalent skills.*** (1-3+0)

CIOS F251 **Integrated Software**
1-3 Credits Offered as Demand Warrants
Focusing on microcomputer applications that integrate multiple tasks into a single tool. Emphasis on integrating and combining information from multiple computer applications. ***Prerequisites: Prior to taking this advanced class, the student is expected to have competence in specific applications and be comfortable using Word, Excel, PowerPoint and Access.*** (1-3+0)

CIOS F255 **Microcomputer Graphics**
1-3 Credits Offered as Demand Warrants
Comprehensive survey of microcomputer graphics using a graphics application. Includes use of professional-level graphics programs to create sophisticated graphics for a variety of uses. Also available through the Center for Distance Education. ***Recommended: CIOS F150 or equivalent computer literacy including saving/retrieving files, use of office applications, Internet and e-mail.*** (1-3+0)

CIOS F257 **Digital Video**
1-3 Credits Offered as Demand Warrants
Comprehensive survey of creating and editing digital video using microcomputer tools. Includes the use of professional-level digital video applications to create short videos for a variety of uses. May be repeated for a total of 12 credits. ***Recommended: Experience with microcomputer graphic applications such as Photoshop.*** (1-3+0)

CIOS F258 **Digital Photography**
1-3 Credits Offered as Demand Warrants
Comprehensive survey of tools and methods to create and edit digital images using microcomputer tools. Includes the use of professional-level digital photography applications. May be repeated for a total of 12 credits. ***Recommended: Experience with microcomputer graphic applications such as Photoshop.*** (1-3+0)

CIOS F502 **Using the Internet**
1 Credit
Accessing Internet services including Usenet, a global electronic bulletin board; Telnet to log on to other computer systems; Gopher and Worldwide Web menu systems; Archie file searches; FTP file transfers; binary file uploads/downloads; and listservs. Ongoing Independent Learning. ***Prerequisites: CIOS F501.*** (1+0)

CIOS F503 **Applying Telecommunications**
1 Credit
Design and implementation of an approved project using telecommunications in the classroom or work place, or an in-depth research paper. Ongoing Independent Learning. ***Prerequisites: CIOS F502.*** (1+0)

COMPUTER SCIENCE

A per semester fee for computing facilities will be assessed for one or more CS courses. This fee is in addition to any materials fees.

CS F101 **Computers and Society** (m)
3 Credits
Computer literacy for everyone. Overview of computing machines and automatic data processing. Interaction between social institutions and automated decision-making. Introduction to business applications software and electronic mail. Some programming for understanding, not for skill development. Also available through the Center for Distance Education. ***Prerequisites: Two years of high school mathematics, including at least one year of algebra.*** (3+0)

CS F102 **Introduction to Computer Science** (m)
3 Credits
Introduction to computer science including a discussion of binary numbers, data representation, hardware, software, programming layers, operating systems, applications and networks. This web-based course is offered through the Center for Distance Education. Also available through the Center for Distance Education. ***Prerequisites: Two years of high school mathematics including at least one year of algebra.*** (3+0)

CS F103 **Introduction to Computer Programming** (m)
3 Credits
Programming for non-majors and for those computer science students without the background for CS F201. Concepts of object-oriented programming and algorithm design within the syntax of the JAVA programming language. ***Prerequisites: Math placement at the 100-level.*** (3+0)

CS F201 **Computer Science I** (m)
3 Credits
The discipline of computer science including problem solving, algorithm development, structured programming, top-down design, good programming style, object-oriented programming and elementary data structures. Concepts implemented with extensive programming experience in a structured language and with a group programming project. ***Prerequisites: One year high school level programming or CS F103 and mathematics placement at the F200-level.*** (3+0)

CS F202 **Computer Science II** (m)
3 Credits
The discipline of computer science including problem solving, algorithm development, structured programming, top-down design, good programming style, object-oriented programming and elementary data structures. Concepts implemented with extensive programming experience in a structured language and with a group programming project. ***Prerequisites: CS F201.*** (3+0)

CS F205 **C Programming** (m)
3 Credits Offered as Demand Warrants
A high-level programming course using C for students with some experience in other programming languages such as Java, Perl, Basic, Pascal or Fortran. ***Prerequisites: One year high school programming, CS F103 or CS F201 or ES F201.*** (3+0)

CS F221 **Introduction to LINUX** (m)
3 Credits Offered Fall Even-numbered Years
Introduction to the LINUX operating system including system features, scripting, shell instructions, controlling user processes, maintaining and administering a LINUX system. (3+0)

CS F301 **Assembly Language Programming** (m)
3 Credits Offered Fall
Organization of computer registers, I/O and control. Digital representation of data. Symbolic coding, instructions, addressing modes, program segmentation, linkage, macros and subroutines. ***Prerequisites: CS F201.*** (3+0)

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CS F307 **Discrete Mathematics** (m)
3 Credits
Logic, counting, sets and functions, recurrence relations graphs and trees. Additional topics chosen from probability theory. ***Prerequisites: MATH F201X or permission of instructor.*** Cross-listed with MATH F307. (3+0)

CS F311 **Data Structures and Algorithms** (m)
3 Credits
Data structures and the algorithms for their manipulation. Object-oriented programming, arrays, tables, stacks, queues, trees, linked lists, sorting, searching and hashing. ***Prerequisites: CS F202.*** (3+0)

CS F321 **Operating Systems** (m)
3 Credits Offered Spring
Functions of files and operating systems. Review of required architectural features. The PROCESS concept. Storage management, access methods and control, interrupt processing, scheduling algorithms, file organization and management, and resource accounting. ***Prerequisites: CS F301.*** (3+0)

CS F331 **Programming Languages** (m)
3 Credits Offered Spring
Syntax and semantics of widely differing programming languages. Syntax specification, block structure, binding, data structures, operators and control structures. Comparison of several languages such as ALGOL, LISP, SNOBOL and APL. ***Prerequisites: CS F311.*** (3+0)

CS F361 **Systems Security and Administration** (m)
3 Credits Offered Alternate Fall Odd-numbered Years
Advanced systems programming including privileged instructions and system services, authentication technologies, host-based and network-based security issues. Applications to asynchronous I/O, process control and communication, device drivers and file management. ***Prerequisites: CS F301.*** (3+0)

CS F381 **Computer Graphics** (m)
3 Credits Offered Fall
Creation of computer-generated images on programmable 3-D graphics hardware. Color, lighting, textures, hidden surfaces, 3-D geometric transformations, curve and surface representations, 2-D and 3-D user interfaces, and the visual modeling of physical phenomena. ***Prerequisites: CS F202; MATH F202X or MATH F314.*** (3+0)

CS F405 **Introduction to Artificial Intelligence** (m)
3 Credits Offered Spring Even-numbered Years
Examine diverse branches of Al placing Al in larger context of computer science and software engineering. Knowledge representation formalism and search technology. Programming methodologies; procedural systems such as expert systems and blackboard systems and non-procedural systems such as neural networks. Software engineering aspects of problem selection, knowledge acquisition, verification and validation. Individual projects. ***Prerequisites: CS F311 or permission of instructor.*** (3+0)

CS F411 **Analysis of Algorithms** (m)
3 Credits Offered Fall
Analysis of classic algorithms, their implementation and efficiency. Topics from combinatorics (sets, graphs), algebra (integer arithmetic, primes, polynomial arithmetic, GCD, Diophantine equations, encryption), systems (parsing searching, sorting) and theory (recursion, Turing machines). The complexity classes P, NP and NP complete. ***Prerequisites: MATH F307, CS F311.*** (3+0)

CS F421 W **Distributed Operating Systems** (m)
3 Credits Offered Fall
Detailed level study of distributed operating system algorithms, functions and associated implementation. Distributed operating system tuning methods and security. Role of distributed operating systems in net-centric computing. Programming, documentation and evaluation of distributed operating system segments as projects. ***Prerequisites: CS F321; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (3+0)

CS F425 **Database Systems** (m)
3 Credits Offered Spring Odd-numbered Years
Data independence, modeling, relationships and organization. Hierarchical, network and relational data models; canonical schema. Data description languages, SQL, query facilities, functional dependencies, normalization, data integrity and reliability. Review of current database software packages. ***Prerequisites: CS F311; CS F321.*** (3+0)

CS F431 W **Programming Language Implementation** (m)
3 Credits Offered as Demand Warrants
Design and implementation of major phases of high level language translators including scanning, parsing, translation, code generation and optimization. Students develop a compiler for a language in a group project which emphasizes good software engineering practices in structured design, testing and documentation. ***Prerequisites: CS F331; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** (3+0)

CS F441 **System Architecture** (m)
3 Credits Offered Fall
Computer design fundamentals, performance and cost, pipelining, instruction-level parallelism, memory hierarchy design, storage systems, and vector processing. ***Prerequisites: CS F321; EE F341.*** (3+0)

CS F442 **Computer Communication and Networks** (m)
3 Credits Offered Fall Even-numbered Years
Study of computer networks using the ISO/OSI layered model as a framework. Design issues and trade-offs, protocols and selected standards. Emphasis on ISO/OSI Layers 1-4/(Physical, Data Link, Network and Transport Layers), plus medium access sublayers (LAN's, etc.). ***Prerequisites: CS F321.*** (3+0)

CS F451 **Automata and Formal Languages** (m)
3 Credits Offered Spring Odd-numbered Years
Finite automata, regular languages, phrase structured grammars, context free language, push down automata, deterministic context free languages, recursive and recursively enumerable languages, Turing machines, decision problems, and undecidability. ***Prerequisites: MATH F307; CS F201.*** (3+0)

CS F460 **Introduction to Digital Forensics**
3 Credits Offered Fall Odd-numbered Years
Takes a hands-on approach to the forensics examination of computer technology. Focuses on the forensic process, methods, and tools utilized to collect and preserve and examine digital evidence. Course topics include: collection, preservation and examination of evidence from computers including file systems, e-mail and malicious code. ***Prerequisites: CS F321; or permission of instructor.*** (3+0)

CS F462 **Intrusion Detection Systems**
3 Credits Offered Fall Even-numbered Years
Focus on IDS theory and practice and its importance; the origin and resolution of common security threats and vulnerabilities; host and network approaches to IDS implementation; and the legal, ethical, and privacy issues associated with IDS use and policies. ***Prerequisites: CS F361; or permission of instructor.*** (3+0)

CS F463 **Cryptography and Data Security**
3 Credits Offered Spring Odd-numbered Years
Specialized study of cryptography and its application in securing data systems, with an emphasis on applied cryptography. Topics include history of cryptography, encryption, digital signatures, authentication, electronic commerce, key distribution and management, private and public key cryptography, and protocols. ***Prerequisites: MATH F307; CS F311; or permission of instructor.*** (3+0)

CS F471 W **Software Engineering** (m)
3 Credits Offered Fall
Introduction to basic software engineering principles, techniques, methods and standards as applied to the engineering of complex software systems. Topics from software system development process models, multiple view system modeling and specification using UML, classification of software

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systems, project management and legal issues. ***Prerequisites: Senior standing; CS F311; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** Cross-listed with SWE F471. (3+0)

CS F472 W,O **Senior Project and Professional Practice**
3 Credits Offered Spring
Group projects in a real computer industry environment and produce appropriate documentation and reports. Nature, ethics, and legal considerations of the computer science profession are discussed with an emphasis on ethics. Additional topics include project management, design methodologies, technical presentation, human-machine interface and programming team interactions. ***Prerequisites: Senior standing; CS F471; COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** (3+0)

CS F480 **Topics in Computer Science**
3 Credits Offered as Demand Warrants
Topics include, but are not limited to; computational linear algebra, cryptography, parallel algorithm development and analysis. Note: Course may be repeated when topics change. (0+3)

CS F481 **Topics in Computer Graphics** (m)
3 Credits Offered Spring
Hardware, software and techniques used in computer graphics taken from topics such as volume rendering, particle systems, shading, image processing, computer aided design, video effects, animation and virtual environments. ***Prerequisites: CS F381.*** (3+0)

CS F490 **Student Internship** (m)
1-3 Credits
Students work on computer science project under the joint direction of a faculty member and participating industry or governmental agency. Graded Pass/Fail. ***Prerequisites: Junior standing and acceptance in an approved internship program.*** (0+0)

CS F602 **Software Project Management**
3 Credits Offered Spring
Work in an IT project environment to produce appropriate documentation and reports. Nature, ethics and legal considerations of managing IT projects are discussed. Includes project management, design methodologies, scope management, risk management, human-machine interface and IT team interactions. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

CS F605 **Artificial Intelligence**
3 Credits Offered Spring Even-numbered Years
Study and writing of AI programs: expert systems, expert system shells, blackboard systems, neural networks. Representation of knowledge, pattern analysis, inference networks, neural network training. Study of software engineering aspects of AI software. ***Prerequisites: Graduate standing or permission of CS graduate advisor.*** (3+0)

CS F611 **Complexity of Algorithms**
3 Credits Offered Fall
Theoretical analysis of various algorithms: topics include sorting, searching, selection, polynomial evaluation, NP completeness, decidability. ***Prerequisites: CS F411.*** (3+0)

CS F621 **Advanced Systems Programming**
3 Credits Offered as Demand Warrants
Multiprogramming and multiprocessing systems. File and program security. Scheduling optimization and system tuning, I/O processing, archiving and system recovery, and initialization. Study of current systems. ***Prerequisites: CS F311 and CS F321.*** (3+0)

CS F622 **Performance Evaluation**
3 Credits Offered as Demand Warrants
A survey of techniques of modeling and testing concurrent processes and the resources they share. Includes levels and types of system simulation, performance prediction, benchmarking and synthetic loading, hardware and software monitors. ***Prerequisites: CS F321 or permission of Computer Science graduate advisor.*** (3+0)

CS F625 **Database Systems Design**
3 Credits Offered Fall
The design and analysis of database systems including data independence, relationships, and organization. Focus on data models, file organization and security, index organization, data integrity and reliability. Review of current database software packages. Design and implementation of a database application project. ***Prerequisites: CS F311.*** (3+0)

CS F631 **Programming Language Implementation**
3 Credits Offered Fall
Formal treatment of programming language translation and compiler design. Parsing context-free languages, translation specifications, machine independent code, NBF, scanners, symbol tables, parsers and recursive descent. Programming of compiler or interpreter segments as projects. ***Prerequisites: CS F331.*** (3+0)

CS F641 **Advanced Systems Architecture**
3 Credits Offered Spring
A study of advanced single processor systems. Detailed study of multiprocessor architectures, such as vector architectures, massively parallel processors and shared-memory multi-processors. ***Prerequisites: CS F441 or permission of Computer Science graduate advisor.*** (3+0)

CS F642 **Advanced Computer Networks**
3 Credits Offered Fall
A study of networks of interacting computers. The problems, rationales and possible solutions for both distributed processing and distributed databases will be examined. Major national and international protocols will be presented. ***Prerequisites: Graduate standing or permission of Computer Science graduate advisor.*** (3+0)

CS F651 **The Theory of Computation**
3 Credits Offered Spring Odd-numbered Years
Languages and formal models of algorithms: Turing machines, phrase structured grammars and recursive functions. Undecidability, the halting problem, Rice's Theorem. ***Prerequisites: CS F451.*** (3+0)

CS F661 **Optimization**
3 Credits Offered Fall Even-numbered Years
Linear and nonlinear programming, simplex method, duality and dual simplex method, post-optimal analysis, constrained and unconstrained nonlinear programming, Kuhn-Tucker condition. Applications to management, physical and life sciences. Computational work with the computer. ***Prerequisites: Knowledge of calculus, linear algebra, and computer programming.*** Cross-listed with MATH F661. (3+0)

CS F670 **Computer Science for Software Engineers**
3 Credits
An overview and survey of the theoretical underpinnings of computer science. Topics are taken from the areas of algorithms and data structures; computer architecture; computer networks, communications, and operating systems; computability and formal languages; languages and compilation. Also available through the Center for Distance Education. ***Prerequisites: Graduate standing.*** Cross-listed with SWE F670. (3+0)

CS F671 **Advanced Software Engineering**
3 Credits Offered Spring
Advanced software development as an engineering discipline. Includes investigation of current tools, standards, foundation and trends in software engineering from component-ware, software system composition, e-systems, software architecture and CASE tools. ***Prerequisites: CS F471.*** Cross-listed with SWE F671. (3+0)

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CS F672 **Software Process Improvement**
3 Credits Offered Spring Odd-numbered Years
Commonly applied methods for improving the software development process. Emphasis on the Software Engineering Institute's Capability Maturity Model, and specifically on the key process areas of Level 2 and Level 3 of that model. These include software configuration management, software quality assurance and software standards. ***Prerequisites: CS F671 or permission of instructor.*** Cross-listed with SWE F672. (3+0)

CS F673 **Software Requirements Engineering**
3 Credits Offered as Demand Warrants
Focus on the requirements analysis phase of the software development life cycle. Study ways to obtain, analyze and specify complete and correct sets of requirements. Critique of selected requirements analysis models. Study of current large scale software developments that have failed or are failing. Development of software requirements specifications for large and real software systems via team efforts. Also available through the Center for Distance Education. ***Prerequisites: CS F671 or permission of instructor.*** Cross-listed with SWE F673. (3+0)

CS F674 **Software Architecture**
3 Credits Offered Spring
Software architectural styles are introduced and defined as structural descriptions of software systems. Methods for constructing and binding software systems are introduced and specified as operational views. The architectural approach, as a classical engineering method for describing structure and behavior of technical artifacts, will be applied for the composition of software systems. ***Prerequisites: CS F671.*** Cross-listed with SWE F674. (3+0)

CS F680 **Topics in Computer Science**
1-4 Credits Offered as Demand Warrants
Example topics include, but are not limited to, software requirements engineering, cryptography, parallel algorithm development and analysis. May be repeated for credit with change of topic. ***Prerequisites: Varies with each topic. Recommended: Varies with each topic.*** (1-4+0)

CS F681 **Topics in Computer Graphics**
3 Credits Offered Spring
Hardware, software and techniques used in computer graphics taken from topics such as refresh, storage, raster scan technology, volume rendering, particle systems, shading, image processing, computer aided design, video effects, animation and virtual environments. ***Prerequisites: CS F481 and MATH F314.*** (3+0)

CS F690 **Graduate Seminar and Project**
1-6 Credits Offered Fall
First semester of two-semester seminar in which students will, individually or in teams, work on and present the results of major programming or literature survey projects in computer science or software engineering. Written and oral reports will be required. Graded Pass/Fail. ***Prerequisites: 12 credits in graduate computer science or software engineering courses; or permission of Computer Science or Software Engineering graduate advisor.*** Cross-listed with SWE F690. (1-6+0)

CS F691 **Graduate Seminar and Project**
3 Credits Offered Spring
Second semester of a two-semester seminar in which students will, individually or in teams, work on and present the results of major programming or literature survey projects in computer science or software engineering. Written and oral reports will be required. Graded Pass/Fail. ***Prerequisites: CS F690; 12 credits in graduate computer science or software engineering courses; or permission of Computer Science or Software Engineering graduate advisor.*** Cross-listed with SWE F691. (3+0)

CONSTRUCTION MANAGEMENT

CM F102 **Methods of Building Construction**
3 Credits Offered as Demand Warrants
Introduces basic knowledge of building materials, technical specifications, techniques, and systems. Outlines structural systems, construction processes, and assemblies. Includes a field project student team research of current Alaskan building type. Special fees apply. (3+0)

CM F123 **Codes and Standards**
3 Credits Offered as Demand Warrants
Provides an introduction and overview of the fundamental provisions of the building codes used for plan review, life-safety evaluation of buildings, and community development. Special fees apply. ***Prerequisites: CM F102; DRT F170.*** (3+0)

CM F142 **Mechanical and Electrical Technology**
4 Credits Offered as Demand Warrants
Introduces the basic mechanical and electrical systems required in all buildings for the safety, health, comfort, and convenience of the occupants. Emphasizes design criteria, code requirements and interpretation of construction drawings. Special fees apply. (3+2)

CM F163 **Building Construction Cost Estimating**
3 Credits Offered as Demand Warrants
Presents methods and techniques for preparing accurate cost estimates for building construction projects. Emphasizes quantity surveys, productivity, bidding and negotiation procedures, and cost control systems. Special fees apply. ***Prerequisites: CM F102; DRT F170; MATH F107X.*** (2+2)

CM F201 **Construction Project Management**
3 Credits Offered as Demand Warrants
Examines construction project management methods and processes. Includes project delivery systems, contract agreements, contract general and supplementary conditions and contract administration procedures. Special fees apply. ***Prerequisites: CM F102; DRT F170.*** (3+0)

CM F202 **Project Planning and Scheduling**
3 Credits Offered as Demand Warrants
Examines concepts and methods for planning and scheduling of construction projects. Includes identifying work elements, analyzing resources, determining activity durations, preparing CPM schedules using computer scheduling software, preparing schedule updates and analyzing planning versus actual progress for cost control. Special fees apply. ***Prerequisites: CM F201; MATH F108.*** (2+2)

CM F205 **Construction Safety**
3 Credits Offered as Demand Warrants
Examines safety and health practices for the construction industry. Includes developing and implementing construction project site-specific safety plans, analyzing the laws and regulations that govern safety, evaluating construction site hazards and environmental conditions and incident investigation and reporting. Special fees apply. ***Prerequisites: CM F201.*** (3+0)

CM F213 **Civil Technology**
4 Credits Offered as Demand Warrants
Outlines elements of civil design, including soils and soil mechanics, foundations, roads, and utilities using local, state and federal regulations. Students will also be introduced to elements of construction surveying. Special fees apply. ***Prerequisites: CM F102; DRT F170.*** (2+4)

CM F231 **Structural Technology**
4 Credits Offered as Demand Warrants
Examines structural theory and the physical principles that underlie structural behavior. Includes the use of materials in a manner to maintain structural stability against such natural forces as gravity, wind, snow and earthquakes. Covers connection detailing and code requirements for wood, steel and reinforced concrete. Special fees apply. ***Prerequisites: CM F102; DRT F170.*** (2+4)

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CM F263 **Civil Construction Cost Estimating**
3 Credits Offered as Demand Warrants
Presents methods and techniques for preparing accurate cost estimates for earthwork, roads, highways, underground utilities and site work. Emphasizes quantity surveys, unit costs, production factors, bidding and construction equipment management. Special fees apply. ***Prerequisites: CM F213; MATH F108.*** (2+2)

CM F299 **Construction Management Internship**
3 Credits Offered as Demand Warrants
Places students in building construction offices related to student's educational program and occupational objectives. Direct supervision by contractor professional, program faculty and Career Services coordinator. Graded Pass/Fail. ***Prerequisites: Department approval.*** (0+0+225)

CONSTRUCTION TRADES TECHNOLOGY

CTT F100 **Construction Technology Core**
3 Credits Offered as Demand Warrants
Basic construction techniques using OSHA approved standards by stressing how to follow safe work practices and procedures, how to safely use hand and power tools, how to extract information from construction blueprints and drawings, good housekeeping habits, and material handling on the construction site. This course is divided into six modules. Each module must be successfully completed. May be repeated twice for credit. (Alternative: CTT F101; CTT F102; CTT F103; CTT F104.) (2.5+1.5)

CTT F101 **Basic Construction Safety**
1 Credit Offered as Demand Warrants
Introduction to basic construction safety using OSHA approved standards. Focus is on safe work practices and procedures, the proper inspection of safety equipment before use and the proper use of safety equipment. (Alternative to CTT F100 when taken with CTT F102; CTT F103; CTT F104.) (1+0.5)

CTT F102 **Introduction to Hand and Power Tools**
1 Credit Offered as Demand Warrants
Introduction to basic hand and power tools used in construction and maintenance and the importance of their care and use. Valuable safety information for each type of tool is discussed. Understanding proper usage helps trainees to prevent accidents. Some specialty tools used by different crafts are also introduced. (Alternative to CTT F100 when taken with CTT F101; CTT F103; CTT F104.) ***Prerequisites: CTT F101 or permission of instructor.*** (0.5+1)

CTT F103 **Introduction to Blueprint Reading**
1 Credit Offered as Demand Warrants
Introduction to basic blueprint terms, components and symbols. Different types of construction drawings commonly used on job sites and why each type of drawing is important will be presented. Standardized information contained on blueprints such as identification, revision status, symbols, project titles, dimension and scale will be covered. (Alternative to CTT F100 when taken with CTT F101; CTT F102; CTT F104.) ***Prerequisites: CTT F102 or permission of instructor.*** (1+1)

CTT F104 **Basic Communication and Employability Skills**
2 Credits Offered as Demand Warrants
Techniques for communicating effectively with co-workers and supervisors. Includes critical thinking and problem-solving skills and reviews effective relationship skills, effective presentation and key workforce issues such as sexual harassment, stress and substance abuse. (Alternative to CTT F100 when taken with CTT F101; CTT F102; CTT F103.) ***Prerequisites: CTT F103 or permission of instructor.*** (2+0)

CTT F106 **Construction Mathematics**
3 Credits Offered as Demand Warrants
Introduction to basic mathematical procedures commonly used in the construction and maintenance crafts. Includes multiplication, subtraction, addition, division, working with fractions and measuring areas, volume and capacity of shapes. (3+0)

CTT F110 **Residential Carpentry — Level I**
8.5 Credits Offered as Demand Warrants
Introduction to basic materials and framing techniques used in the construction trades. Includes an orientation, introduction to materials and advanced tools used in the trades. Includes techniques used in framing a structure and to exterior doors and windows commonly installed on construction projects and their proper installation. This course is divided into seven modules. Each module must be successfully completed. (Alternative: CTT F111; CTT F112; CTT F113; CTT F114.) ***Prerequisites: CTT F100 or permission of instructor.*** (5+7)

CTT F111 **Materials and Tools Used in the Trade**
2.5 Credits Offered as Demand Warrants
Examines the sources and uses of various softwoods and hardwoods, the grading system for lumber and plywood, composition and uses of various engineered sheet materials and laminated lumber products and the many kinds of fasteners and adhesives used with wood and masonry construction. Expands on the hand and power tool information provided in the construction technology core and introduces the carpentry trainee to additional tools used in the carpentry trade. (Alternative to CTT F110 when taken with CTT F112; CTT F113; CTT F114.) ***Prerequisites: CTT F100 or permission of instructor.*** (2+1)

CTT F112 **Floor Systems, Wall and Ceiling Framing**
2 Credits Offered as Demand Warrants
Focuses on framing basics. Includes the procedures for laying out and constructing a wood floor using common lumber as well as engineered building materials, procedures for laying out and framing walls and ceilings, roughing in doors and window openings, construction corners and partition Ts, bracing walls and ceilings, and applying sheathing. (Alternative to CTT F110 when taken with CTT F111; CTT F113; CTT F114.) ***Prerequisites: CTT F111 or permission of instructor.*** (1+2)

CTT F113 **Roof Framing, Windows, and Exterior Doors**
2 Credits Offered as Demand Warrants
Describes the various kinds of roofs and instructions for laying out rafters for gable roof, hip roof and valley intersections. Includes both stick built and truss built roofs, various types of windows, skylights, exterior doors, and instructions for installing weather stripping and lock sets. (Alternative to CTT F110 when taken with CTT F111; CTT F112; CTT F114.) ***Prerequisites: CTT F112 or permission of instructor.*** (1+2)

CTT F114 **Introduction to Concrete Materials and Forms**
2 Credits Offered as Demand Warrants
Introduction to various cements and other materials which when mixed form various types of concrete. Includes concrete volume estimates, concrete tests, concrete curing methods, reinforcement materials such as rebar, bar supports and welded-wire fabric and tasks in the construction of foundations and flat work. (Alternative to CTT F110 when taken with CTT F111; CTT F112; CTT F113.) ***Prerequisites: CTT F113 or permission of instructor.*** (1+2)

CTT F115 **Residential Carpentry — Level II**
12 Credits Offered as Demand Warrants
This course builds upon the skills learned in CTT F110. Includes methods and techniques used to locate structures and install exterior siding and related element protection. Various types of roofing and installation of those materials, types and methods of drywall and its installation and interior finish applications. This course is divided into eleven modules. Each module must be successfully completed. (Alternative: CTT F116; CTT F117; CTT F118; CTT F119.) ***Prerequisites: CTT F110 or permission of instructor.*** (6+12)

CTT F116 **Reading Plans and Site Layout — Level I**
2 Credits Offered as Demand Warrants
This course builds upon CTT F110. Introduces the principles, equipment and methods used to perform site layout tasks of distance measurements, differential leveling and the site layout responsibilities of individuals on the

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site. (Alternative to CTT F115 when taken with CTT F117; CTT F118; CTT F119.) ***Prerequisites: CTT F110 or permission of instructor.*** (1+2)

CTT F117 Exterior Finish and Moisture Protection
2 Credits Offered as Demand Warrants
Introduction to materials and installation techniques used in various types of siding. Includes the installation procedures and basic requirements for insulation, moisture control and ventilation. (Alternative to CTT F115 when taken with CTT F116; CTT F118; CTT F119.) ***Prerequisites: CTT F116 or permission instructor approval.*** (1+2)

CTT F118 Roofing, Stairs and Metal Studs Applications
3 Credits Offered as Demand Warrants
Introduction to materials and installation techniques for a number of basic types of roofing. Includes installation techniques of stairs and metal studs. (Alternative to CTT F115 when taken with CTT F116; CTT F117; CTT F119.) ***Prerequisites: CTT F117 or permission of instructor.*** (2+2)

CTT F119 Drywall and Interior Finish Applications
5 Credits Offered as Demand Warrants
Introduction to materials, tools and procedures used to install and finish gypsum drywall on walls and ceilings and to correct drywall finishing problems. Includes installation of various types of doors and their related hardware in several types of walls, materials, tools and procedures used to lay out, install, and maintain suspended ceilings and the different types of trim. (Alternative to CTT F115 when taken with CTT F116; CTT F117; CTT F118.) ***Prerequisites: CTT F118 or permission of instructor.*** (2+6)

CTT F120 Introductory Skills for the Crew Leader
1 Credit Offered as Demand Warrants
Basic leadership skills required for the job. Practicing effective human relations skills: communicating, listening, motivating workers, solving conflict, scheduling, safety and resource control that are an essential part of the crew leader's job. ***Prerequisites: CTT F100 or permission of instructor.*** (1+0)

CTT F121 Train the Trainer
2 Credits
Journeypersons are needed to transfer their skills to younger workers and this program will provide the skilled person with an intense series of discussions related to teaching strategies, classroom management and leadership, group dynamics and evaluation of training. Program completers may qualify for adjunct status with UAF. ***Prerequisites: Skilled journeyperson in specific skill area or permission of instructor.*** (2+0)

CTT F130 Introduction to Facilities Maintenance
1 Credit Offered as Demand Warrants
Provides students with basic safety instruction of hand and power tools and chemicals used in the facilities maintenance occupation in accordance with Federal OSHA regulations. The students will be instructed in the safe work practices of Personal Protective Equipment (PPE) requirements which support awareness of job-site hazards and protections, such as lockout/tag out and hazardous communications. (0+0)

CTT F131 Interior Repairs: Drywall, Woodwork Trim, Window Replacement
1 Credit Offered as Demand Warrants
Provides students with basic theory of drywall repair (removing, replacing, texturing and painting). Special tools will be used in applying trim to ceilings, walls and door frames. Instruction will be given in selecting, cutting and fastening trim, removing and replacing damaged windows, replacing opening and closure mechanisms and in reapplying trims and paintings. (0+0)

CTT F132 Flooring Installation: Vinyl, Wood and Parquet
1 Credit Offered as Demand Warrants
Introduces students to concepts and practical applications of installing vinyl, wood and parquet floor coverings. Students will learn how to install underlayment, vinyl flooring tiles, trim and baseboard components, as well as, use special tools for correctly installing parquet flooring with subflooring installation. (0+0)

CTT F133 Cabinet Installation with Countertops
1 Credit Offered as Demand Warrants
Provides students with basic concepts of installing cabinets with countertops and identify different types of cabinet construction (stock, semi-custom and custom built). Students will be shown be different types of wood products and be introduced to special tools. Face-to-face instruction and practical application of different techniques of installing base cabinets and top or wall cabinets will be shown. (0+0)

CTT F134 Garbage Disposal Installation
1 Credit Offered as Demand Warrants
Inform students of the basic knowledge of installing a garbage disposal unit in a basic kitchen cabinet. Students will learn how to use special tools in connecting drain and waste piping and venting systems from a house unit. Students will review safety issues related to the proper handling of plumbing hand and power tools in the installation process. (0+0)

CTT F135 Boiler Troubleshooting and Burner Repair
2 Credits Offered as Demand Warrants
Focuses on the basic components of boilers and burners used in industry for heating residential and commercial properties. Key concepts and strategies related to the process and safety operations of combustion, boiler thermodynamics, control systems, fuel pumps, ignition systems, draft and venting principles and boiler operation according to Alaska code. Upon completion of the training each student may sit for the State of Alaska Boiler Class 4 License. (0+0)

CTT F136 Landscaping and Horticulture
2 Credits Offered as Demand Warrants
Introduces students to the process/procedure of preparing and landscaping a grounded area. Students will be introduced to concepts of placement of appropriate plants and vegetation, maintenance of edged and mowed lawn area, weed and fertilization control and watering schedules. (0+0)

CTT F137 Appliance Troubleshooting and Repair
2 Credits Offered as Demand Warrants
Provides students with conceptual and practical applications in troubleshooting and repairing appliances. Students will be instructed in diagnostic skills that support repairing and replacing components in various equipment such as refrigerators, washing machines, dishwashers, clothes dryer and oven and cook-tops. ***Prerequisite: Instructor approval.*** (0+0)

CTT F138 Troubleshooting HVAC Systems
2 Credits Offered as Demand Warrants
Provides conceptual and practical applications for students wishing to become a HVAC technician. Topics will explore diagnosis of equipment problems in operation, testing and adjusting conventional and electronic thermostats. Students will also receive instruction on the operation of common electrical, electronic and pneumatic circuits used to control HVAC systems. ***Recommended: Instructor approval if student has not taken CTT courses.*** (0+0)

CTT F150 Plumbing — Level I
4 Credits Offered as Demand Warrants
Introduction to basic plumbing techniques, math, hand and power tools, extraction of information from construction drawings and materials used in the plumbing trade. This course is divided into ten (10) modules. Each module must be successfully completed. (Alternative: CTT F151; CTT F152; CTT F153; and CTT F154.) ***Prerequisites: CTT F110 or permission of instructor.*** (3+2)

CTT F151 Introduction to Plumbing Tools and Drawings
1 Credit Offered as Demand Warrants
Introduction to a plumber's basic hand and power tools, their care and maintenance, and safety procedures. Includes the basics of reading plumbing blueprints and drawings and specific plumbing drawings such as isometric and oblique pictorial drawings, orthographic drawings and schematic drawings. (Alternative to CTT F150 when taken with CTT F152; CTT F153; and CTT F154.) ***Prerequisites: CTT F110 or permission of instructor approval.*** (1+0.5)

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CTT F152 **Introduction to Plumbing Math**
1 Credit Offered as Demand Warrants
A review of basic math skills and how those skills relate to pipe measuring and fitting techniques. Introduction to pipe measuring and the basics of figuring simple offsets. (Alternative to CTT F150 when taken with CTT F151; CTT F153; and CTT F154.) ***Prerequisites: CTT F151 or permission of instructor.*** (1+0)

CTT F153 **Plastic and Copper Pipe and Fittings**
1 Credit Offered as Demand Warrants
Introduction to the various types of plastic and copper pipe used in the plumbing industry. Includes various methods of joining plastic and copper pipe and a variety of fittings commonly found in commercial and residential dwellings. (Alternative to CTT F150 when taken with CTT F151; CTT F152; CTT F154.) ***Prerequisites: CTT F152 or permission of instructor.*** (0.5+1)

CTT F154 **Fixtures, Faucets and Venting Systems**
1 Credit Offered as Demand Warrants
Covers the various types of fixtures plumbers install, including sinks, bathtubs, water closets, garbage disposals, dishwashers and mop basins. An overview of the drain, waste and vent system from inside the building, where the liquid drains into pipes, to the sewer and waste treatment plants. (Alternative to CTT F150 when taken with CTT F151; CTT F152; CTT F153.) ***Prerequisites: CTT F153 or permission of instructor.*** (0.5+1)

CTT F155 **Plumbing — Level II**
8 Credits Offered as Demand Warrants
Introduction to basic plumbing techniques, math, hand and power tools, extraction of information from construction drawings and materials used in the plumbing trade. This course is divided into thirteen modules. Each module must be successfully completed. Generally, each will have two components, a written exam and a hands-on competency test. (Alternative: CTT F156; CTT F157; CTT F158; CTT F159.) ***Prerequisites: CTT F150 or permission of instructor.*** (4.5+7)

CTT F156 **Intermediate Math and Reading Commercial Drawings**
2 Credits Offered as Demand Warrants
Techniques for calculating simple, rolling and parallel offsets. Includes how to interpret and use civil, architectural, structural, mechanical, plumbing and electrical drawings when installing plumbing systems. (Alternative to CTT F155 when taken with CTT F157; CTT F158; CTT F159.) ***Prerequisites: CTT F150; CTT F152; or permission of instructor.*** (1+2)

CTT F157 **Installing and Testing DWV Piping and Other Drains**
2 Credits Offered as Demand Warrants
Examination of the installation process for drain, waste and vent (DWV) piping and the procedures for locating DWV stacks and fixtures, installing and connecting DWV stacks using hangers and supports, determining grade and testing and inspecting plumbing installations. Includes the proper techniques for locating, installing and connecting roof, floor and area drains according to code. (Alternative to CTT F155 when taken with CTT F156, CTT F158, CTT F159.) ***Prerequisites: CTT F156 or permission of instructor.*** (1+2)

CTT F158 **Valves, Faucets and Fixtures: Installation and Testing**
3 Credits Offered as Demand Warrants
Examination of the many types and uses of valves, and valve repair and replacement. Includes how to locate, connect and test water supply piping while observing safety guidelines and the installation of basic plumbing fixtures, including bathtubs, shower stalls, lavatories, sinks, water closets, urinals, as well as their valves and faucets. Students will learn about gas-fired, electric, solar and indirect water heaters and review the proper installation and testing techniques. Includes troubleshooting and repair of fixtures, valves and faucets in accordance with safety guidelines. (Alternative to CTT F155 when taken with CTT F156; CTT F157; CTT F159.) ***Prerequisites: CTT F157 or permission of instructor.*** (2+2)

CTT F159 **Fuel Gas Systems**
1 Credit Offered as Demand Warrants
Introduction to the various types of fuel gas and fuel oil systems. Includes characteristics of the different fuels and system installation and appliances. (Alternate to CTT F155 when taken with CTT F156; CTT F157; CTT F158.) ***Prerequisites: CTT F158 or permission of instructor.*** (0.5+1)

CTT F170 **Residential Electrical — Level I**
9 Credits Offered as Demand Warrants
Introduction to basic electrical techniques, electrical theory, and extraction of information from construction drawings, tools, and materials used in the electrical trades. Course is divided into twelve modules. Each module must be successfully completed. (Alternative: CTT F171; CTT F172; CTT F173; CTT F174.) ***Prerequisites: CTT F115 or permission of instructor.*** (8+2)

CTT F171 **Electrical Safety and Electric Theory**
2 Credits Offered as Demand Warrants
Course covers the safety rules as applied to handling and working with electrical systems and circuits. Includes the required OSHA mandated lockout/tag out procedure, basic electric theory and circuit calculations involving the application of Ohm's and Kirchoff's laws. The student is made aware of precautions to take for various electrical hazards found on the job site. (Alternative to CTT F170 when taken with CTT F172; CTT F173; CTT F174.) ***Prerequisites: CTT F115 or permission of instructor.*** (2+0)

CTT F172 **Alternating Current, Electrical Test Equipment and the NEC**
2 Credits Offered as Demand Warrants
Introduction to the principles of alternating current and the operation and applications of various types of electrical test equipment. Includes National Electrical Code. (Alternative to CTT F170 when taken with CTT F171, CTT F173; CTT F174.) ***Prerequisites: CTT F171 or permission of instructor.*** (2+0)

CTT F173 **Raceways, Boxes, Fittings, and Hand Bending**
2.5 Credits Offered as Demand Warrants
Introduction to various types of raceways, boxes and fittings, and applications and installation procedures for various types of fasteners and anchors. Also covered are methods and procedures used in cutting, bending, and reaming conduit. (Alternative to CTT F170 when taken with CTT F171; CTT F172; and CTT F174.) ***Prerequisites: CTT F172 or permission of instructor.*** (2+1)

CTT F174 **Boxes and Fittings, Conductors, Terminations and Splices**
2.5 Credits Offered as Demand Warrants
Introduction to methods and procedures used in the selection and installation of outlet boxes and fittings. Topics include various types of conductors, how conductors are rated by the NEC, and the different methods used for pulling conductors through conduit runs. (Alternative to CTT F170 when taken with CTT F171; CTT F172; CTT F173.) ***Prerequisites: CTT F173 or permission of instructor.*** (2+1)

CTT F175 **Residential Electrical — Level II**
8 Credits Offered as Demand Warrants
Introduction to basic electrical techniques, electrical theory and extraction of information from construction drawings, tools and materials used in the electrical trades. This course is divided into ten modules. Each module must be successfully completed. (Alternative: CTT F176; CTT F177; CTT F178; CTT F179.) ***Prerequisites: CTT F170 or permission of instructor.*** (4+8)

CTT F176 **Electrical Blueprint Reading, Wiring Devices and Raceway, Box and Fitting Fill**
2 Credits Offered as Demand Warrants
Introduction to electrical blueprint reading. Includes methods and procedures used when sizing and selecting wiring devices. (Alternative to CTT F175 when taken with CTT F177; CTT F178; CTT F179.) ***Prerequisites: CTT F170 or permission of instructor.*** (1+2)

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CTT F177 **Wiring: Commercial and Residential and Grounding**
2 Credits Offered as Demand Warrants
Introduction to grounding and various types of switches and receptacles used in commercial and industrial wiring. (Alternative to CTT F175 when taken with CTT F176; CTT F178; CTT F179.) ***Prerequisites: CTT F176 or permission of instructor.*** (1+2)

CTT F178 **Circuit Breakers, Fuses and Electric Services**
2 Credits Offered as Demand Warrants
Introduction to methods and procedures used in selection and installation of circuit breakers and fuses and in the installation of electric services. (Alternative to CTT F175 when taken with CTT F176; CTT F177; CTT F179.) ***Prerequisites: CTT F177 or permission of instructor.*** (1+2)

CTT F179 **Lighting Fixtures and Related Components**
2 Credits Offered as Demand Warrants
Covers methods and procedures used in the handling and installation of different types of lamps and lighting fixtures and builds on the information and lighting principles previously covered. Topics include information on the operation of specific types of lamps and related lighting fixtures and circuit controls. (Alternative to CTT F175 when taken with CTT F176; CTT F177; CTT F178.) ***Prerequisites: CTT F178 or permission of instructor.*** (1+2)

CTT F199 **Student Practicum I**
1-3 Credits
Provides the student the opportunity to practice and develop the skills learned in the classroom. Skills will be developed under the guidance of journeyman and/or qualified personnel on the job site. Course may be repeated twice for a total of three credits. ***Prerequisites: CTT F115 or permission of instructor*** (0+2-6)

CTT F299 **Student Practicum II**
1.5 Credits Offered as Demand Warrants
Provides the student the opportunity to practice and develop the skills learned in the classroom. Skills will be developed under the guidance of journeyman and/or qualified personnel on the job site. ***Prerequisites: CTT F155 or permission of instructor.*** (0+3)

CTT F299P **Student Practicum II**
1.5 Credits Offered as Demand Warrants
Provides the student the opportunity to practice and develop the skills learned in the classroom. Skills will be developed under the guidance of journeyman and/or qualified personnel on the job site. Graded Pass/Fail. ***Prerequisites: CTT F155 or permission of instructor.*** (0+3)

COUNSELING

COUN F615 **Foundations of Counseling**
3 Credits Offered Fall, As Demand Warrants
Introduction to the philosophies, organization, patterns and techniques that aid counselors in preparing clients for responsible decision-making in modern society. ***Prerequisites: Admittance to Counseling program; or permission of instructor.*** (3+0)

COUN F623 **Counseling Theories and Applications I**
3 Credits Offered Fall, As Demand Warrants
A survey of the major theoretical systems of counseling and psychotherapy combined with a laboratory experience focused on building microskills in counseling. Specific application of theoretical principles will be investigated, analyzed and described. ***Prerequisites: Admittance to Counseling program; or permission of instructor.*** Cross-listed with PSY F660. (3+2)

COUN F628 **Child and Adolescent Development**
3 Credits Offered Fall
Focus on developmental processes and sequences of change that children experience within each developmental domain from birth through adolescence. ***Prerequisites: Admittance to Counseling program; or permission of instructor.*** (3+0)

COUN F629 **Counseling Interventions**
3 Credits Offered Spring
Course examines various intervention strategies/techniques for working with individuals across the lifespan in a variety of situations. Attention is placed on assisting children, youth and adults in accomplishing developmental tasks appropriate to their psychosocial growth. ***Prerequisites: COUN F623; admittance to the Counseling program; or permission of instructor.*** (3+0)

COUN F630 **Appraisal for Counselors**
3 Credits Offered Fall; As Demand Warrants
Introduction to the kinds of assessment information school and community counselors utilize in the assessment process. ***Prerequisites: COUN F623; admittance to Counseling program; or permission of instructor.*** (3+0)

COUN F632 **Career Development**
3 Credits Offered Fall
An introduction to the theories of career development, career choices and how to translate theory into practice. Emphasis will be on career education development and the utilization of information resources for facilitating the career choice decision-making process. ***Prerequisites: COUN F615; admittance to Counseling program; or permission of instructor.*** (3+0)

COUN F634 **Practicum in Individual Counseling**
3 Credits Offered Spring, Summer; As Demand Warrants
Supervised practice in basic counseling skills and techniques. Supervised work with one-on-one counseling relationships. Actual practice in listening, problem identification, goal setting and session management. ***Prerequisites: COUN F623; admittance to Counseling program; permission of instructor.*** (2+7)

COUN F636 **Internship I**
3 Credits
Supervised practice in school or community setting. Focus on directed practice of particular skills relevant to the counselor's role. Weekly seminars will cover actual and role playing situations providing opportunities to operationalize theory in counseling, interventions and ethical issues. (3 credits required for elementary internship; 3 credits required for secondary internship; 3 credits required for community internship; students may take all three.) Special fees apply. ***Prerequisites: COUN F634; admittance to Counseling program; permission of instructor.*** (2+7)

COUN F638 **Adult Development**
3 Credits Offered Spring As Demand Warrants
An overview of physical, cognitive, personality and social development across the adult life span, from high school graduation through death. Major theories and research findings in the field of adult development are explored with an emphasis on examining how individuals progress through a series of predictable stages during their lifetime. ***Prerequisites: COUN F615; admittance to Counseling program; or permission of instructor.*** (3+0)

COUN F646 **School Counseling**
3 Credits Offered Fall
Topics related to the role of the school counselor such as consultation, career guidance and culturally appropriate assessment. ***Prerequisites: COUN F623; admittance to Counseling program; or permission of instructor.*** Cross-listed with PSY F646. (3+0)

COUN F647 **Professional Ethics**
3 Credits Offered Fall
The ethical standards of the American Psychological Association and the American Counseling Association will be examined, discussed and compared. Students will be provided with opportunities to apply these general principles

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to specific cases. Students will be expected to demonstrate a knowledge of the principles of these ethical codes and an ability to apply them to their reality based manifestations. Also available through the Center for Distance Education. ***Prerequisites: Admittance to Counseling program, or permission of instructor.*** Cross-listed with PSY F647. (3+0)

COUN F650 Cross-Cultural Psychopathology
3 Credits Offered Fall
An overview of contemporary perspectives on child and adult psychological disorders from the perspective of cultural psychology. Fundamentals of therapeutic interviewing. Training in use of the DSM-IV diagnostic system. Examination of the role of culture, ethnicity, gender and social class in symptom formation and the experience of illness, and critical examination of these issues in clinical application of the DSM-IV. Training in DSM-IV cultural formulation. ***Prerequisites: PSY F345; COUN F623; admittance to the Counseling program; or permission of instructor.*** Cross-listed with PSY F650. (3+0)

COUN F660 Cross-Cultural Counseling
3 Credits Offered Spring; As Demand Warrants
An examination of cultural and ethnic variables in human nature and their effect on the counseling process. Specific focus will be placed on the nature and function of culture, cultural variables in the context of the human experience, universal and culture specific aspects of the counseling process, barriers to effective cross-cultural counseling, specific ethnic and cultural considerations, and methods of intellectual training with special emphasis on Alaskan applications. ***Prerequisites: Admittance to the Counseling program; or permission of instructor.*** Cross-listed with PSY F661. (3+0)

COUN F666 Family and Network Therapy
3 Credits Offered Spring
Survey of concepts and theories of function and dysfunction in the area of couples and families as social networks. In addition, it provides an introduction to the skills necessary for one who would intervene in these systems. ***Prerequisites: COUN F623; admittance to the Counseling program; or permission of instructor.*** Cross-listed with PSY F666. (3+0)

COUN F674 Group Counseling
3 Credits Offered Spring, Alternate Summer, As Demand Warrants
Kinds and types of groups with emphasis on methods, problems and needed skills in working with groups in a counseling situation. ***Prerequisites: COUN F623; admittance to Counseling program; permission of instructor.*** Cross-listed with PSY F674. (3+0)

COUN F690 Internship II
3-9 Credits
Opportunity to perform all the activities that a regularly employed counselor would be expected to perform in a school or community setting. At the completion of the internship the student will be able to demonstrate knowledge and skills needed to administer school and/or community counseling services. (3 credits required for elementary internship; 3 credits required for secondary internship; 3 credits required for community internship; student may take all three.) Special fees apply. ***Prerequisites: COUN F634; COUN F636; permission of instructor.*** (0+3-9)

CROSS-CULTURAL STUDIES

CCS F602 Cultural and Intellectual Property Rights
3 Credits Offered Spring
Examines issues associated with recognizing and respecting cultural and intellectual property rights with respect to the documentation, publication and display of knowledge, practices, beliefs and artifacts of cultural traditions. Appropriate research principles, ethical guidelines and legal protections will be reviewed for their application to cross-cultural studies. ***Prerequisites: Graduate standing or approval of the instructor.*** (3+0)

CCS F603 Field Study Research Methods
3 Credits
Focus on techniques for conducting both quantitative and qualitative field research. Particular emphasis on considerations for conducting field research in cross-cultural settings. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with ED F603. (3+0)

CCS F604 Documenting Indigenous Knowledge
3 Credits Offered Fall
A thorough grounding in research methodologies and issues associated with documenting and conveying the depth and breadth of indigenous knowledge systems and their epistemological structures. Includes a survey of oral and literate data-gathering techniques, a review of various modes of analysis and presentation, and a practical experience in a real-life setting. ***Prerequisites: Graduate standing or approval of the instructor.*** Cross-listed with: ED F604. (3+0)

CCS F608 Indigenous Knowledge Systems
3 Credits Offered Fall
A comparative survey and analysis of the epistemological properties, world views and modes of transmission associated with various indigenous knowledge systems. Emphasis on knowledge systems practiced in Alaska. ***Prerequisites: Graduate standing or approval of instructor.*** Cross-listed with RD F608; ED F608; ANL F608. (3+0)

CCS F610 Education and Cultural Processes
3 Credits Offered as Demand Warrants
Advanced study of the function of education as a cultural process and its relation to other aspects of a cultural system. Students will be required to prepare a study in which they examine some aspect of education in a particular cultural context. Also available through the Center for Distance Education. Cross-listed with ED F610. (3+0)

CCS F611 Culture, Cognition and Knowledge Acquisition
3 Credits Offered Fall
An examination of the relationship between learning, thinking and perception in multicultural contexts. Particular emphasis will be on the implications of these relationships for schooling. Content will focus on cultural influences on perception, conceptual processes, learning, memory and problem solving. Content will also reflect concern for practical teaching problems. Cross-listed with ED F611. (3+0)

CCS F612 Traditional Ecological Knowledge
3 Credits Offered Spring
Examines the acquisition and utilization of knowledge associated with long-term inhabitation of particular ecological systems and adaptations that arise from the accumulation of such knowledge. Attention will be given to the contemporary significance of traditional ecological knowledge as a complement to academic fields of study. ***Prerequisites: Graduate standing or approval of the instructor.*** Cross-listed with RD F612. (3+0)

CCS F613 Alaska Standards for Culturally Responsive Schools
3 Credits Offered as Demand Warrants
Guidelines, rationale and resources for adapting educational policies, programs and practices to better address the cultural well-being of the students and communities they serve. Content will be grounded in the "Alaska Standards for Culturally Responsive Schools" including standards for students, teachers, curriculum, schools and communities. Cross-listed with ED F613. (3+0)

CCS F616 Education and Socioeconomic Change
3 Credits Offered as Demand Warrants
An examination of social change processes, particularly in relation to the deliberate development of new institutions and resulting forms of new consciousness. Emphasis is placed on the role of education and schooling in this development dynamic. Also available through the Center for Distance Education. Cross-listed with: ED F616 (3+0)

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CCS F620 **Critiquing Indigenous Literature for Alaska's Children**
3 Credits Offered as Demand Warrants
Provides educators with a comprehensive framework for reviewing literature that is written about and for Alaska's indigenous children. An in-depth look at how children's literature influences the image of the indigenous children of Alaska and provides a foundation for selecting curriculum materials that accurately represent and address the cultural context of the students and communities they serve. This is a distance education/audio-conference course. ***Prerequisites: Graduate standing, teaching certificate, or approval of the instructor.*** (3+0)

CCS F631 **Culture, Community and the Curriculum**
3 Credits Offered Fall
Salient issues involved with the development of effective programs of instruction in small schools, including foundational design, conceptual models, organizational strategies, technical skills, current issues and trends, and their implications and application to the environment of rural Alaska. Also available through the Center for Distance Education. Cross-listed with: ED F631 (3+0)

CCS F690 **Seminar in Cross-Cultural Studies**
3 Credits Offered as Demand Warrants
Investigation of current issues in cross-cultural contexts. Opportunity for students to synthesize their prior graduate studies and research. Seminar is taken near the terminus of a graduate program. ***Prerequisites: Advancement to candidacy and permission of student's graduate committee.*** Cross-listed with ANL F690; ED F690; RD F690. (3+0)

CULINARY ARTS

CAH F060 **Basic Techniques of Cooking I**
3 Credits
Basics in the culinary arts field designed for students with special needs. Special fees apply. ***Prerequisites: Permission of instructor.*** (1.5+6)

CAH F070 **Basic Techniques of Cooking II**
6 Credits
An open ended course providing an appropriate learning sequence for students with special needs. Special fees apply. ***Prerequisites: Permission of instructor.*** (3+12)

CAH F105 **Principles of Food Service I**
3 Credits Offered Fall, Spring, As Demand Warrants
Food service and the principle variations which students may encounter in the industry; professional standards, kitchen safety, first aid, storeroom operation, kitchen equipment and basic culinary terminology. (3+0)

CAH F117 **Art in Cake Icing**
2 Credits
The preparation of cakes for icing and decorating. Topics include borders, clowns, flowers, leaves, pattern transfer, frozen buttercream, confectionery coating, royal icing, plus designing cakes, and rolled buttercream. Use of an airbrush, flow in techniques and tiered cake assembly covered. Graded Pass/Fail. (1+2)

CAH F140 **Food Production I**
5 Credits
Basic food service skills in a commercial kitchen environment. Standardized recipes and procedures stressed. End product critiqued daily. Student assignments rotate between stock and soup station, vegetable station, pantry, and service line and grill. Emphasis on sanitary food handling practices and professional work habits. Special fees apply. (5+0)

CAH F141 **Food Production II**
5 Credits
Continuation of CAH F140 with emphasis on preparation and use of small sauces, sauteing, roasting, braising, stewing and broiling. Salad bar preparation and grill service covered. Special fees apply. (5+0)

CAH F145 **Bakery Production I**
5 Credits
Basic commercial baking skills and procedures. Standardized recipes and procedures stressed. End product critiqued daily. Emphasis on sanitary food handling practices and professional work habits. Special fees apply. (5+0)

CAH F146 **Bakery Production II**
5 Credits
Continuation of CAH F145 with emphasis on Danish and French pastries, combination breads, tortes and fancy dessert items. Materials fee: See note at beginning of section. Special fees apply. (5+0)

CAH F150 **Food Service Sanitation**
2 Credits
Designed for entry-level through supervisory personnel of food service establishments. Basic microbiology, safe food handling techniques, good hygienic practices, pest control, employee training and the Alaska laws governing food service establishments. Upon successful completion the student can earn ServSafe Managers Certification from the National Restaurant Association Education Foundation; the course also satisfies a requirement for certification with the American Culinary Federation. (2+0)

CAH F152 **Supervisory Development**
2 Credits
Problems and challenges that food service supervisors deal with every day. Development of personnel management methods. (2+0)

CAH F154 **Dining Room Service**
2 Credits
American-style table service. Dining room service, management, controls and methods. (2+0)

CAH F160 **Principles of Nutrition**
2 Credits
Basic principles of nutrition with emphasis on nutrients and their function in relation to human health. (2+0)

CAH F161 **Pastry Tube Art**
1 Credit
Basic cake and food product techniques including borders, flowers, cake designing and proper use of pastry tube bags. (1+1)

CAH F170 **Gourmet Cooking**
2 Credits
Preparation and service of gourmet beef, poultry and seafood entrees for the home cook. Recipes represent new ideas in home entertainment and menus change every semester. Graded Pass/Fail. Special fees apply. (2+0)

CAH F171 **Gourmet Baking**
2 Credits
Preparation of a wide range of breads, pastries, fancy desserts, French pastry and simple tortes. Recipes represent traditional methods of baking along with current trends in home entertainment. Graded Pass/Fail. Special fees apply. (2+0)

CAH F172 **Gourmet Asian Cooking**
2 Credits
Preparing and serving Asian dishes. Study and use of proper cooking methods will be emphasized. Students prepare and enjoy a full meal during each class session. Graded Pass/Fail. Special fees apply. (0.5+3)

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CAH F174 Vegetarian Cooking
2 Credits
Preparation and service of vegetarian foods and balanced meals. Use of nourishing condiments will be explored. Recipes will include some seasonal, ethnic and gourmet foods; however the emphasis will be on preparing quick, healthful, tasty meatless meals. Graded Pass/Fail. Special fees apply. (0.5+3)

CAH F175 Introduction to Meat Cutting I
2 Credits Offered as Demand Warrants
Professional meat cutting for lamb, beef, pork, poultry, and seafood; health regulations using current industry standards; sausage making and meat curing. Graded Pass/Fail. (1.5+2.5)

CAH F176 Heart Healthy and Diabetic Cooking
1 Credit
Demonstrations of healthy cooking using glycemic index and other heart healthy and diabetic texts, in order to encourage participants to monitor weight, control blood sugar, reduce risk of heart disease and manage type 1 and 2 diabetes. Graded Pass/Fail. Special fees apply. (1+3)

CAH F177 Introduction to Zymurgy
1 Credit
Introduction to the history, science and process of brewing. Focus will be on the importance of sanitation for the home brewery, brewing traditional styles with an introduction to specialty brews. Attention will be given to the pairing of beer styles to food. Graded Pass/Fail. Special fees apply. ***Prerequisites: Students must be 21 years of age to enroll.*** (1+3)

CAH F178 Intermediate Zymurgy
1 Credit
Introduction to the history, science and process of brewing beer. Emphasis in brewing will focus on the use of adjuncts, their specific purposes and the effects they have on the brewing/fermentation process will be paramount. Focus will be on the importance of sanitation for the home brewery, brewing traditional styles with an introduction to specialty brews. Attention will be given to the pairing of beer styles of food, as well as the use of beer in cooking. Focus will be on the more advanced style of brewing called partial mash. We may, time and weather permitting, brew a batch from grain. All brews done in this class will make use of adjuncts and/or grains. Graded Pass/Fail. Special fees apply. ***Prerequisites: CAH F177; student must be 21 years of age to enroll.*** (1+3)

CAH F199 Culinary Arts Workstudy Externship
1-12 Credits Offered Summer, As Demand Warrants
Practice in a variety of food service operations, learning current cooking methods and techniques. Student evaluations by the externship coordinator and the employer. Enrollment by special permission only. (0+0)

CAH 230 Menu Planning
1 Credit
The importance of the menu in various food operations. The menu is considered to be the controlling factor in both commercial and noncommercial food service operations. Using a menu as a management tool in every area of the operation from planning the facility, purchasing food items, promoting items to customers and providing excellent service to help ensure success. The student will plan and write a variety of menus. ***Recommended: CAH F140; CAH F146; CAH F150.*** (1+0)

CAH F242 Food Production III
5 Credits
Continuation of CAH F141 with emphasis on a la carte and production cooking. Students prepare foods for the advanced table service class. Foods will represent current trends in the industry with kitchen organization and professional methods stressed. Special fees apply. ***Prerequisites: CAH F141.*** (5+0)

CAH F243 Food Production IV
5 Credits
Continuation of CAH F242 with emphasis on international and new trends in American Cooking. The role of the garde manger in the modern kitchen explored. Special fees apply. ***Prerequisites: CAH F242 or permission of instructor.*** (5+0)

CAH F247 Bakery Production III
5 Credits
Continuation of CAH F146 with emphasis on specialty breads, desserts, cakes, tortes and French pastries. Ability to plan and organize production, schedule and supervise other students emphasized. Special fees apply. ***Prerequisites: CAH F146 or permission of instructor.*** (5+0)

CAH F248 Bakery Production IV
5 Credits
Continuation of CAH F247 with emphasis on pastry buffet. Students will produce artistic centerpieces, decorated tortes and cakes, assorted French pastries, petit fours and candies. Special fees apply. ***Prerequisites: CAH F146; CAH F247; or permission of instructor.*** (5+0)

CAH F250 Garde Manger
2 Credits Offered as Demand Warrants
A hands-on experience in buffet. Presentation of hot and cold foods. Students produce pates, mousses, forcemeats, aspics and other items essential to culinary expertise. (2+0)

CAH F253 Storeroom Purchasing and Receiving
2 Credits Offered as Demand Warrants
Formal and informal methods of purchasing, receiving and storing of food and nonfood items in food service operations. Specifications, par inventory systems and controls. (2+0)

CAH F255 Food Service Management
2 Credits Offered as Demand Warrants
The management team's responsibility in food service operation. Students assume the role of kitchen manager, dining room manager and general manager. (2+0)

CAH F256 Food Service Accounting
2 Credits Offered as Demand Warrants
Principles and practices concerned with determination of food cost, labor cost, beverage cost and the basic accounting practices necessary to operate a successful food service operation. (2+0)

CAH F257 Oenology-Hospitality Industry I
1 Credit Offered as Demand Warrants
Study and evaluation of the wines of France, Germany, Italy and the California wine producing areas. Focus on "point of sale" approach for first level serving staff. Special attention to selecting for individual meals. Graded Pass/Fail. Special fees apply. ***Prerequisites: Must be at least 21 years of age to enroll.*** (1+0)

CAH F258 Oenology-Hospitality Industry II
1 Credit Offered as Demand Warrants
A continuation of CAH F257 with in-depth evaluation and study of the major wine producing areas of the Pacific Northwest, California, France, Germany and Italy. Focus on preparing the new sommelier. Special attention to selections for building cellar and developing breadth in the restaurant. Graded Pass/Fail. Special fees apply. ***Prerequisites: CAH F257 or permission of instructor. Must be at least 21 years of age to enroll.*** (1+0)

CAH F259 Advanced Oenology
1 Credit Offered as Demand Warrants
The study and evaluation of the wines of France and Germany. Emphasis on the marketing production, serving and control of wine sales. Graded Pass/Fail. Special fees apply. ***Prerequisites: CAH F257; CAH F258; or permission of instructor. Must be at least 21 years of age to enroll.*** (1+0)

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DENTAL ASSISTING

DA F132 **Administrative Procedures for the Dental Assistant**
2 Credits Offered Fall
Administrative responsibilities performed by dental assistants in dental facilities. Includes duties of the office assistant, receptionist or secretary, and insurance coordinator. Focus on reception, telephone procedures, scheduling, public relations, insurance and professionalism. ***Prerequisites: High school graduation, GED, or permission of instructor.*** (2+0)

DA F150 **Dental Radiography**
4 Credits
The study of film and digital radiographic techniques in the dental practice. Introduces student to radiographic anatomy and radiation physics. Includes safety in exposing, processing and mounting dental radiographs. Presents hazardous materials handling, equipment operation and maintenance. Prepares students for the Dental Assisting National Board's radiology health and safety examination. Special fees apply. (3+2)

DA F151 **Dental Infection Control**
2 Credits
Principles and practices of infection control in the dental office. Includes knowledge of disease, microbiology, transmission prevention and methods of compliance with OSHA and CDC regulations. Prepares students for the Dental Assisting National Boards infection control examination. (2+0)

DA F152 **Dental Materials and Applications**
4 Credits
Physical and chemical properties of restorative dental materials and the application of those materials. Includes properties and manipulation of gypsum material, impression materials and custom trays, basic crown and bridge procedures. Special fees apply. ***Prerequisites: HLTH F151 or may be taken concurrently.*** (2+4)

DA F153 **Anatomy for Dental Assistants**
3 Credits
Study of anatomy as it applies to the field of dental assisting. Includes basic body systems and an in-depth examination of dental embryology, histology, morphology and head/neck anatomy. (3+0)

DA F251 **Clinical Chairside I for Dental Assistants**
6 Credits
Introduction to dental assisting. Beginning skills necessary to function as a chairside dental assistant in a general dentistry practice. Emphasis on developing clinical skills in four-handed dentistry techniques. Special fees apply. ***Prerequisites: Permission of program coordinator.*** (3+6)

DA F252 **Clinical Chairside II for Dental Assistants**
6 Credits
Emphasizes advanced dental assisting skills necessary in general dentistry. Includes taking impressions for study models, radiography, matrix assembly, rubber dam application, assisting with the administration of local anesthetics, temporary crowns, oral health and nutrition. Includes introduction to specialty practices. Special fees apply. ***Prerequisites: HLTH F251.*** (3+6)

DA F253 **Clinical Chairside III for Dental Assistants**
3 Credits
Continued learning in the dental specialties including prosthodontics, endodontics, periodontics, pedodontics, orthodontics, and oral and maxillofacial surgery. Special fees apply. ***Prerequisites: HLTH F251; HLTH F252; permission of program coordinator.*** (2+2)

DA F254 **Dental Assistant Practicum**
4 Credits
Clinical, off-campus course for dental assisting students. Placement in general and specialty dental offices under direct supervision by participating dentist and program faculty. Includes seminars to discuss progress and experiences. Graded Pass/Fail. ***Prerequisites: HLTH F122; HLTH F132; HLTH F150; HLTH F152; HLTH F153; HLTH F234; HLTH F251; HLTH F252; HLTH F253; enrollment by special permission only.*** (1+0+20)

DENTAL HYGIENE

DH F111 **Dental Anatomy, Embryology and Histology**
2 Credits Offered Fall
Introduction to embryology and histology of the periodontal tissues. Includes discussion of dental accretions and cariology. Special fees apply. ***Prerequisites: Admission to the dental hygiene program or permission of department.*** (2+0)

DH F112 **Techniques I for Dental Hygienists**
7 Credits Offered Fall
A pre-clinical course introducing the basic dental hygiene procedures including data gathering, patient education and basic instrumentation. Emphasis is placed on skill development in basic instrumentation and infection control. Special fees apply. ***Prerequisites: Admission to the dental hygiene program.*** (3+8)

DH F114 **Anatomy of the Orofacial Structures**
2 Credits Offered Fall
Provides students with knowledge to perform technical skills within the oral cavity, especially those relating to dental screening and record-taking. Special fees apply. ***Prerequisites: Permission of department.*** (2+0)

DH F121 **Periodontics I**
2 Credits
Introduction to periodontal disease. Emphasis is placed on recognition of periodontal disease and treatment planning. ***Prerequisites: Admission to the dental hygiene program.*** (2+0)

DH F122 **Techniques II for Dental Hygienists**
4 Credits Offered Spring
Introduces adjunctive techniques used in dental hygiene treatment. Basic manipulation of dental materials. Emphasis is placed on care of materials and restorations that are encountered intra-orally during dental hygiene treatment. Radiology lab provides opportunity to develop competence in exposing radiographs on patients under direct faculty supervision. Special fees apply. ***Prerequisites: Admission to the dental hygiene program.*** (2+4)

DH F165 **Introduction to Dental Pharmacology**
2 Credits Offered Fall
Introduction to general concepts of pharmacology, the nature of drug reactions, individual responses to drugs, principles of neuropharmacology, toxicology, anti-infective therapy, effect of drugs on cardiovascular, endocrine and other body systems. Emphasis is placed on drugs used in dentistry. ***Prerequisites: Permission of department.*** (2+0)

DH F181 **Clinical Practicum I**
4 Credits Offered Spring
Provides opportunity for the student to achieve clinical skill competency with individuals presenting themselves as periodontally healthy or with signs of gingivitis. Special fees apply. ***Prerequisites: Admission to the dental hygiene program.*** (0+0+12)

DH F182 **Clinical Seminar I**
1 Credit Offered Spring
Discussion and evaluation of clinical experiences encountered in DH F181. Emphasis is placed on review of treatment plans and case presentation. Introduces ethical and legal concerns of the dental hygiene profession. Guest speakers, patient management and teamwork are emphasized. ***Prerequisites: Admission to the dental hygiene program.*** (1+0)

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DH F211 **Periodontics II**
2 Credits Offered Fall
Develops familiarity with current non-surgical and surgical techniques in the treatment of periodontal disease. Nutrition and immunology as it relates to periodontal diseases are discussed. Case presentations are made by students. ***Prerequisites: Completion of all F100-level dental hygiene classes with a C grade (2.0) or better.*** (2+0)

DH F212 **Techniques III for Dental Hygienists**
3 Credits Offered Fall
Advanced dental hygiene instruments and intra-oral techniques. Provides for discussion of patients with special needs. Special fees apply. ***Prerequisites: Completion of all F100-level dental hygiene class with a C grade (2.0) or better.*** (1+4)

DH F214 **Pathology of Oral Tissues**
2 Credits Offered Fall
Includes the signs, symptoms, contagion recognition of selected diseases of the oral cavity and systemic diseases that manifest themselves in the oral cavity. ***Prerequisites: Completion of all F100-level dental hygiene classes with a C grade (2.0) or better; or permission of department.*** (2+0)

DH F224 **Principles of Dental Health**
3 Credits Offered Spring
Provides a broad understanding of community dental health and dental epidemiology. Students develop and implement a basic community dental health project. ***Prerequisites: Completion of all F100-level dental hygiene classes with a C grade (2.0) or better.*** (2+0+3)

DH F283 **Clinical Practicum II**
5 Credits Offered Fall
Provides opportunity to achieve clinical skill competency with individuals presenting themselves with mild to moderate periodontal disease. Conducted in a clinical setting with volunteer patients and individualized instruction. Special fees apply. ***Prerequisites: Completion of all F100-level dental hygiene classes with a C grade (2.0) or better.*** (0+0+15)

DH F284 **Clinical Seminar II**
1 Credit Offered Fall
Discussion and evaluation of clinical experiences encountered in DH F283. Emphasis is placed on review of treatment plans and case presentations of patients exhibiting mild to moderate periodontal disease. ***Prerequisites: Completion of all F100-level dental hygiene classes with a C grade (2.0) or better.*** (2+0)

DH F285 **Clinical Practicum III**
6 Credits Offered Spring
Provides opportunity to achieve clinical skill competency with individuals presenting themselves with moderate to advanced periodontal disease. Learning occurs through student practice and individualized instruction. Special fees apply. ***Prerequisites: Completion of all F100-level dental hygiene classes with a C grade (2.0) or better.*** (0+0+18)

DH F286 **Clinical Seminar III**
1 Credit Offered Spring
Discussion and evaluation of clinical experiences encountered in DH F285. Emphasis is placed on review of treatment plans and case presentations of patients exhibiting mild to moderate periodontal disease. ***Prerequisites: Completion of all F100-level dental hygiene classes with a C grade (2.0) or better.*** (2+0)

DH F310 **Oral Pain Control for Dental Hygienists**
3 Credits Offered Fall
Examines pharmacology, armamentarium, anatomical and physiological consideration, administration techniques and potential complication of local anesthetic. Analyzes pharmacology, techniques, medical contraindications and management complications accompanying administration and monitoring of nitrous oxide. Special fees apply. ***Prerequisites: Completion of all F100-level dental hygiene classes with a C grade (2.0) or better or current Alaska licensure in dental hygiene; permission of department; current certification in cardiopulmonary resuscitation.*** (1.5+3)

DEVELOPMENTAL ENGLISH

DEVE F060 **Preparatory College Writing I**
3 Credits
Intensive work in the process of writing and revising to improve one's writing skills. ***Prerequisites: Appropriate placement test scores or permission of instructor.*** (3+0)

DEVE F068 **College Writing Skills**
1-3 Credits
Individualized instruction in written language skills. Open entry/open exit, one credit modules in spelling/vocabulary, writing and grammar usage. Enrollment in one or more modules based on diagnosed need or student decision; may be repeated. Does not fulfill degree requirements in written communications or humanities. Graded Pass/Fail. (1-3+0)

DEVE F070 **Preparatory College Writing II**
3 Credits
Instruction in writing to improve students' fluency, accuracy and communication skills. Preparation for ENGL F111X. Also available through the Center for Distance Education. ***Prerequisites: Appropriate placement test scores or permission of instructor.*** (3+0)

DEVE F109 **Preparatory College Writing III**
3 Credits
Strengthen preparatory college writing skills they need for ENGL F111X, including research, writing and revising, and critical reading skills. ***Prerequisites: Appropriate placement test scores or permission of instructor.*** (3+0)

DEVELOPMENTAL MATHEMATICS

DEVM F050 **Prealgebra**
3 Credits
Operations with whole numbers, fractions, decimals, percents and ratios, signed numbers, evaluation of algebraic expressions and evaluation of simple formula. Metric measurement system and geometric figures. Also available through the Center for Distance Education. ***Prerequisites: Appropriate placement test scores.*** (3+0)

DEVM F051 **Math Skills Review**
1 Credit Offered as Demand Warrants
Develops and reviews basic mathematical terminology, theory and operations as outlined by the Alaska State Mathematics Standards. Mathematics topics focus on reviewing the six basic "strands" of mathematical content: numeration, measurement, estimation and computation, function and relationship, geometry, and statistics and probability. Approaches to problem solving will emphasize the process of mathematical thinking, communication and reasoning. It is an appropriate course for those preparing for the High School Qualifying Exam in Alaska or those needing a review of basic math skills in preparation for a math placement test at UAF. May be repeated for a total of three credits. Graded Pass/Fail. (1+0)

DEVM F056 **Math Fast Track: Prealgebra/Elementary Algebra Review**
1 Credit Offered 3 times per year: Augustmester, Wintermester, Maymester
A 20-hour intensive review of math concepts offered prior to each semester. Covers prealgebra and elementary algebra topics to prepare qualified students to potentially improve their math course placement. Students should have a

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history of being successful in equivalent levels of math, although they may not recall enough information to place well on the placement test. Students who are successful in this class have the possibility of advancing through one or two semesters of development math. Graded Pass/Fail. ***Prerequisites: Placement into DEVM F050 or DEVM F060.*** (1+0)

DEVM F060 Elementary Algebra
3 Credits
First year high school algebra. Evaluating and simplifying algebraic expressions, solving first degree equations and inequalities, integer exponents, polynomials, factoring, rational expressions, equations and graphs of lines. Also available through the Center for Distance Education. ***Prerequisites: Grade of C or better in DEVM F050; or ABUS F155, or appropriate placement test scores. Prerequisite courses and/or placement exams must be taken within one calendar year prior to commencement of the course.*** (3+0)

DEVM F061 Review of Elementary Algebra
1 Credit
Designed to assist students in reviewing material covered by DEVM F060. Individuals who have not previously taken an elementary algebra course are recommended to enroll in DEVM F060. Available via Independent Learning only. (1+0)

DEVM F062 Alternative Approaches to Math: Elementary Algebra
3 Credits
Algebraic topics. Includes operations with polynomial expressions, first- and second-degree equations, graphing, integral and relational exponents, and radicals using alternative teaching styles. ***Prerequisites: Grade of C or better in DEVM F050; or ABUS F155; or appropriate placement test scores. Prerequisite courses and/or placement exams must be taken within one calendar year prior to commencement of the course.*** (3+0)

DEVM F065 Mathematics Skills
1-3 Credits
Designed to assist students in reviewing and reinforcing course concepts covered by DEVM F050, DEVM F060, DEVM F062, DEVM F105 and DEVM F106. Consists of instruction which may include lab instruction, individual student work or group work. May be repeated. Recommended for students who need more time and help to master the material in Developmental Math courses. (1-3+0)

DEVM F066 Advanced Math Fast Track: Elementary/ Intermediate Algebra Review
1 Credit Offered 3 times per year: Augustmester, Wintermester, Maymester.
A 20-hour intensive review of math concepts offered prior to each semester. Covers elementary and intermediate algebra topics to prepare qualified students to potentially improve their math course placement. Students should have a history of being successful in equivalent levels of math, although they may not recall enough information to place well on the placement test. Students who are successful in this class have the possibility of advancing through one or two semesters of development math. Graded Pass/Fail. ***Prerequisites: Placement into DEVM F060 or DEVM F105 or DEVM F106.*** (1+0)

DEVM F071 Review of Intermediate Algebra
1 Credit
Course reviews material covered by DEVM F105. Individuals who have not taken an intermediate algebra course on the high-school level are recommended to enroll in DEVM F105. Available via Independent Learning only. (1+0)

DEVM F081 Review of Basic Geometry
1 Credit
High school geometry without formal proofs. Topics include basic definitions, measurement, parallel lines, triangles, polygons, circles, area, solid figures and volume. Available via Independent Learning only. ***Prerequisites: DEVM F060.*** (1+0)

DEVM F082 Hands-On Geometry
1 Credit
Basic concepts and uses of geometry. Emphasis on "hands-on" and applied problems. ***Prerequisites: A solid knowledge of arithmetic — no algebra required.*** (1+0)

DEVM F105 Intermediate Algebra
3 Credits
Second year high school algebra. Operations with rational expressions, radicals, rational exponents, logarithms, inequalities, quadratic equations, linear systems, functions, Cartesian coordinate system and graphing. To matriculate to MATH F107X from DEVM F105 a grade of B or higher is required. Also available through the Center for Distance Education. ***Prerequisites: Grade of C or better in DEVM F060; or DEVM F062; or appropriate placement test scores. Prerequisite courses and/or placement exams must be taken within one calendar year prior to commencement of the course.*** (3+0)

DEVM F106 Intensive Intermediate Algebra
4 Credits
Algebraic topics. Includes exponents, radicals, graphing, systems of equations, quadratic equations and inequalities, logarithms and exponentials, and complex numbers using alternative teaching styles. Note: This course satisfies elective credit only. ***Prerequisites: Grade of C or better in DEVM F060; or DEVM F062; or DEVM F105; or appropriate placement test scores. Prerequisite courses and/or placement exams must be taken within one calendar year prior to commencement of the courses.*** (4+0)

DEVELOPMENTAL STUDIES

DEVS F052 Reading Enhancement
3 Credits Offered as Demand Warrants
Intensive instruction in reading designed to increase vocabulary and comprehension skills necessary for successful reading in the content areas of college courses. (3+0)

DEVS F058 Reading Skills
1-3 Credits Offered as Demand Warrants
Course emphasis is on improving reading comprehension using texts and other materials. Focus is on paragraph structure to recognize main idea, supporting details and author's purpose. Study techniques for recognizing new vocabulary. Small groups allow individually designed course of instruction to meet the needs of the students. Open entry/open exit. May be repeated. Graded Pass/Fail. ***Prerequisites: Placement or permission of instructor.*** (1-3+0)

DEVS F065 Spelling Improvement
1 Credit Offered as Demand Warrants
A diagnostic/prescriptive approach for improving spelling skills. (1+0)

DEVS F066 Vocabulary Development
1 Credit Offered as Demand Warrants
Designed to increase vocabulary substantially and to provide tools for further vocabulary growth. (1+0)

DEVS F100 Introduction to Science
4 Credits
Introduction to skills needed to succeed in core science courses. Topics include scientific terminology, scientific mathematical notation, and the fundamentals of chemistry, physics and biology. Includes basic scientific lab techniques and the skills needed to learn scientific material. ***Prerequisites: Elementary algebra and college reading level.*** (3+3)

DEVS F101 Skills for College and Career Success
3 Credits
A diverse menu of study skills for the student entering the college environment. Skills include active listening, effective reading, taking usable notes, test taking, communication, time and money management. Students learn

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personal development skills that assist in addressing intrusive issues that impact the learning process, increasing self-esteem, and relating these skills to the classroom and later to a career. Class sessions offer diverse learning experiences. (3+0)

DEVS F102 Introduction to Distance Education
1-3 Credits Offered as Demand Warrants
A diverse menu of study skills for the student entering the distant learning college environment. Skills include: active listening, effective reading, taking usable notes, test preparation and test taking strategies, communication, and the use of technology as a study resource - all in the distance learning context. Additionally, personal development elements such as time management, working with university representatives, and accessing local resources will provide skills to maximize the learning experience and address the intrusive issues that impact the learning process. (1-3+0)

DEVS F104 University Communications
1-3 Credits Offered as Demand Warrants
Introduces the unique methods of communication required at the college level. May link with selected lecture courses. May be repeated. (1-3+0)

DEVS F105 Intensive Reading Development
3 Credits
Develops vocabulary, reading strategies, speed and comprehension needed to read, understand and retain information in college textbooks and the skills to write in essay form, about material read. ***Prerequisites: Placement or permission of instructor.*** (3+0)

DEVS F106 Speed Reading
1 Credit
Introduction to newest speed reading techniques. Development of flexible reading rates and increased comprehension and vocabulary skills. Application of techniques to study, professional and leisure reading. (1+0)

DEVS F107 Reader-Writer Workshop
3 Credits Offered as Demand Warrants
A reader-writer workshop to develop fluency in reading and writing skills for persons whose first language is not English. Intensive speaking, listening, reading and writing activities. ***Prerequisites: Placement by examination or student decision.*** (3+0)

DEVS F108 Study Skills Lab
1 Credit Offered as Demand Warrants
Improvement of study skills in areas of greatest need on an individual or small group basis in the lab or other workshop or individualized format. Topics include time and stress management, listening/note taking, library research and memory. Course may be repeated for credit when content varies. (1+0)

DEVS F110 College Success Skills
1 Credit
An introduction and overview of the diverse skills, strategies and resources available to ensure success in the college experience. Topics include study skills, time management, career planning, stress management, communication skills, test taking and personal development skills. Graded Pass/Fail. (1+0)

DEVS F111 Reading in the Mathematical Sciences
1 Credit
Will improve reading skills in math and will support students in their math class. Will provide a supplement instruction time focusing on the introduction and/or development of reading skills that will aid in solving math problems and understanding and retaining the math information delivered in the class. This course will be linked to a math course. Graded Pass/Fail. (1+0)

DEVS F112 Reading in the Natural Sciences
1 Credit
Will improve student success in their current and future natural science classes. Will provide a supplement instructional time focusing on introducing and/or developing reading skills that will aid in reading, understanding, and retaining science information delivered in the natural science lecture and lab. Skills emphasized will include identifying, organizing and prioritizing topic, main idea, and details, note taking, and using effective reading to improve test performance. Must be linked to freshman level science class. Graded Pass/Fail. (1+0)

DEVS F150 Life Work Planning
1 Credit
Planning for a satisfying career choice based on realistic assessment of self, accurate knowledge of the world of work and experience with ways to activate career plans. Enables students to evaluate potential careers and to make educational and job search plans. Graded Pass/Fail. (1+0)

DEVS F160 The Resume: Key to Success
1 Credit
Use the resume writing process to develop job seeking skills: locating the hidden market; researching job potential; learning to fill out effective applications; designing and printing a custom resume; assembling a portfolio; and developing effective interview skills. ***Recommended: DEVS F150.*** (1+0)

DEVS F185 Straight Thinking
3 Credits Offered as Demand Warrants
A study of inductive, deductive and seductive thinking, and skill building to recognize and use all three. Critical thinking skills to analyze newspaper, magazine and spoken arguments. Political speeches and other media presentations examined. Effective and convincing presentation of one's own ideas including formal and informal logic. (3+0)

DIESEL TECHNOLOGY

DSLT F101 Safety Including Rigging and Lifting
1 Credit Offered Fall
Materials covered will be the importance of and proper use ot personal protective gear and air ventilation systems; how to identify harmful chemicals in a shop atmosphere and how to use them in a safe manner; the importance of identifying the weight of an item before lifting with lifting equipment or by hand, and proper lifting procedures of heavy items when using a lifting device. Special fees apply. (1+0)

DSLT F103 Basic Equipment and Truck Operation
1 Credit Offered Fall
Basic operation of heavy equipment and diesel trucks to include: stating, clutching, braking, and steering procedures. Basic forklift operation to include: lifting weight, calculation and point of balance of machine versus lifting load. Special fees apply. (0.5+1.5)

DSLT F105 Preventive Maintenance
3 Credits Offered Fall
Perform scheduled preventive maintenance on vehicles and heavy equipment. Gain knowledge of lubricants, filters, lubrication points and proper fluid levels and understanding of what to look for when performing a visual inspection. Special fees apply. ***Prerequisites: DSLT F101; DSLT F103.*** (1.5+3)

DSLT F107 Basic Electrical Systems and Electronic Fuel Injection
3 Credits Offered Fall
DC voltage and amperage, fuses, circuit breakers, relays and junction boxes will be covered along with an understanding of wiring schematics and identification of and repair of lighting. Special fees apply. (1.5+3)

DSLT F123 Heavy Duty Braking Systems
3 Credits Offered as Demand Warrants
Braking systems for commercial trucks and heavy equipment applications; compressor testing and overhaul, relay valves, actuators, wear limits, acceptable tolerances, brake lining replacement, government regulations and pneumatic controls; evolving technologies such as anti-lock brakes. Remove and

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replace brake shoes, drums, hardware, S-cams and air chambers. Includes the inspection, preventive maintenance and overhaul of a commercial truck or heavy equipment braking system. Special fees apply. ***Prerequisites: DSLT F101; DSLT F103.*** (1.5+3)

DSLT F154 Diesel Fuel Injection
3 Credits Offered Fall
Theory and functional operation of all common diesel fuel injection systems including those produced by modern Bosch, Mack, Cummins, Caterpillar and Detroit Diesel. Direct injection and pre-combustion fuel injection systems. Testing procedures, when testing high pressure diesel injection pumps and injectors as well as removing, installing and adjusting the most common systems used in the heavy truck and heavy equipment industry. Special fees apply. (2+2)

DSLT F201 Manual Transmissions and Differentials
3 Credits Offered as Demand Warrants
Theory, diagnosis and repair of manual transaxles and transmissions, transfer cases, differentials, clutch assemblies, power take off units, driveshafts and axles as well as removing and installing clutches, transmissions and differentials in a truck or piece of heavy equipment. Preventive maintenance and cold weather component problems will also be covered. Special fees apply. ***Prerequisites: DSLT F101; DSLT F103.*** (1+4)

DSLT F202 Heavy Duty Automatic Transmissions
2 Credits Offered Spring
Theory, operation and troubleshooting of heavy duty automatic transmissions; hydraulic, electrohydraulic, pneumatic and electronic controls. Prepares the student to overhaul Allison, ZF and similar automatic transmissions. Special fees apply. (1+3)

DSLT F254 Engine
5 Credits Offered Fall
Understanding the two cycle and four cycle diesel engine. Performing tune-ups, as well as disassembling and reassembling a modern diesel engine commonly found in the heavy truck or heavy equipment industry. Special fees apply. ***Prerequisites: DSLT F101; DSLT F103; DSLT F105; or permission of instructor.*** (2.5+5)

DRAFTING TECHNOLOGY

DRT F101 Introduction to Drafting
3 Credits Offered as Demand Warrants
Introduction to basic drafting skills necessary to communicate in the building, construction, design and process technology industries for freshman-level students and for certificate or associate degree-seeking students. Limited manual drafting techniques will be used to gain basic skills and to contrast the speed and accuracy to that of computer-aided drafting (CAD). Special fees apply. (2+2)

DRT F110 Computer Literacy for Technicians
3 Credits Offered as Demand Warrants
Introduction to operating systems and their applications to technology. Emphasis will be placed on computer literacy for technology and industrial business applications relevant to technicians. Special fees apply. (2+2)

DRT F112 Introduction to GIS
3 Credits Offered as Demand Warrants
Provides drafters with a general overview of what GIS is, who uses GIS, where GIS is used, and how GIS information is obtained and assimilated. There will be a section of practical use on one of the following systems: Manifold, Autodesk MAP, or Arch View. (3+0)

DRT F115 Graphics I
3 Credits Offered as Demand Warrants
Study and application of methods, problems and solutions in graphic design using AutoCAD and Viz. (3+0)

DRT F121 Construction Documents and Drawings
3 Credits Offered as Demand Warrants
Reading and interpretation of construction documents for residential, light commercial and heavy commercial structures using conventional symbols and representation. (3+0)

DRT F123 Uniform Building Code
3 Credits Offered as Demand Warrants
Covers the minimum required construction standards of the Uniform Building Code. Use of local zoning ordinances and the UBC as comprehensive building guides and their principal aspects applied to various building types and trades. Concentrates on zoning, the UBC and some fire codes. Mechanical and electrical codes are introduced only for student familiarity. ***Recommended: Working knowledge of building systems.*** (3+0)

DRT F140 Architectural Drafting
3 Credits Offered as Demand Warrants
Architectural drafting principles including site plans, foundations, floor plans, elevations, architectural sections, framing plans, area plans and graphic standards. Special fees apply. (2+2)

DRT F141 Architectural Concepts
2 Credits Offered as Demand Warrants
Architectural drafting concepts including basic site plans, foundations, floor plans, elevations, architectural sections, framing plans, area plans and graphic standards. Also available through the Center for Distance Education. (2+0)

DRT F145 Structural Drafting
3 Credits Offered Fall
Introduces technical skills needed by structural drafters and technicians to work with structural engineers. Includes office practices, staff relationships, and structural drawing production. Develops computer-aided drafting skills in symbols, conventions, dimensioning systems, sheet organizations, code analysis and research methods for steel, wood, and reinforced concrete buildings. Special fees apply. ***Prerequisites: DRT F170 or permission of program coordinator.*** (3+0)

DRT F150 Civil Drafting
3 Credits Offered as Demand Warrants
Civil drafting principles including plotting traverse and surveys by bearing and distance, latitudes and departures, topographic drawings and maps, contours and elevations, profiles and highway curves, cross-section drawings and grading plans. Special fees apply. (2+2)

DRT F151 Civil Concepts
2 Credits Offered as Demand Warrants
Overview of civil drafting concepts and survey drafting including the plotting of traverse and surveys by bearing and distance. Also available through the Center for Distance Education. (2+0)

DRT F155 Mechanical and Electrical Drafting
3 Credits Offered as Demand Warrants
Introduces technical analysis, theory, code requirements, and CAD techniques to produce construction drawings for mechanical and electrical building systems. Includes drafting conventions, drawing symbols, terminology, and research methods for residential and commercial building systems and equipment. Special fees apply. ***Prerequisites: DRT F170 or permission of program coordinator.*** (3+0)

DRT F170 Beginning CAD
3 Credits
Instruction in basic working knowledge of CAD software and its applications in drafting. Topics covered include an introduction to CAD software

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applications, basic CAD skills and tools, through plotting finished drawings. Practical applications. Special fees apply. (2+2)

DRT F210 **Intermediate CAD**
3 Credits Offered as Demand Warrants
Techniques for construction and drafting output using CAD. Emphasis will be on the construction drawings produced for a building project and the software tools used in this process. Special fees apply. ***Prerequisites: DRT F170 or permission of program coordinator.*** (2+2)

DRT F250 **Civil Drafting II — Advanced**
3 Credits Offered as Demand Warrants
Techniques of highway design, boundaries, right of way layouts, curves and grades, bridges, cut and fill detail drawings, gas and water services, sewers, culverts, signs and guard rails. Special fees apply. ***Prerequisites: DRT F150; DRT F151; or permission of program coordinator.*** (2+2)

DRT F260 **Drafting Internship**
1-6 Credits Offered as Demand Warrants
Supervised work experience in process organizations. Assignments will be individually arranged with cooperating organizations from the private and public sectors. A maximum of 6 credits may be earned. Special fees apply. ***Prerequisites: Permission of program coordinator.*** (0+3-18)

DRT F270 **Advanced CAD**
3 Credits Offered as Demand Warrants
Advanced areas of CAD (3-D, menu modifications and Auto lisp). Special fees apply. ***Prerequisites: DRT F170; DRT F210; or permission of program coordinator.*** (2+2)

EARLY CHILDHOOD EDUCATION

ECE F101 **Introduction to Early Childhood Profession**
3 Credits
Includes historical foundation, current issues and trends, exposure to a variety of developmentally appropriate programs, contemporary needs of children and families, the importance of being an advocate, professional standards and career opportunities, introduction to NAEYC and the code of ethical conduct. (2.75+0.5)

ECE F102 **Essentials of Parenting**
3 Credits Offered as Demand Warrants
An introductory course to help new parents with basic information and skills needed to care for young children. Includes basics of child development, infant care and relationship-building, nutrition and budgeting. May be offered through the high schools with a tech-prep agreement and applied to the early childhood degree programs as elective credit. (3+0)

ECE F104 **Child Development I: Prenatal, Infants and Toddlers** (s)
3 Credits
Foundation in child development prenatal to age 3. Focuses on developmental theories and indigenous perspectives in the prenatal, infancy and toddler periods. Emphasis areas include culturally appropriate practices, developmental domains, relationships and bonding, appropriate environments and curriculum, observation, and early intervention. This course is comparable to ECE F220. Will receive credit for either ECE F104 or ECE F220. To meet the six credit child development requirements for the AAS degree, students must take either ECE F104 with ECE F107 or ECE F220 with ECE F245. ***Prerequisites: ECE F101; placement in ENGL F111X or higher; or permission of instructor. Recommended: Computer with adequate and appropriate software, access to printer, audio conference and internet, and fax machine as needed.*** (2+2)

ECE F105 **Developmentally Appropriate Practice**
1 Credit
Introduction to developmentally and culturally appropriate teaching practice in early childhood settings. Topics include basic verbal skills, inclusion, the teaching process, organizing a class, lesson planning and curriculum development. ***Note: Successful completion of this course is required prior to enrollment in any of the ECE activity classes. This class may be taken concurrently (in the same semester) with the ECE activity classes.*** (0.75+0.5)

ECE F106 **SEED Level I** (Alaska System for Early Education Development)
1 Credit Offered as Demand Warrants
An entry level overview of the Alaska System for Early Education Development (SEED). Through class instruction and guided self-study, students explore the basics of an early childhood career path. Graded Pass/Fail. (1+0)

ECE F107 **Child Development II: The Preschool and Primary Years** (s)
3 Credits
Foundation in child development ages 3-8. Focuses on physical, cognitive, communication, emotional and social development with an emphasis on indigenous knowledge, and cultural and traditional child care practices. Theories and program models will be examined and critiqued. Covers developmental screenings, referrals, inclusion and services for children with special needs. This course is comparable to ECE F245. Students will receive credit for either ECE F107 or ECE F245. To meet the six credit child development requirement for the AAS degree, students must take either ECE F107 with ECE F104 or ECE F245 with ECE F220. ***Prerequisites: ECE F101; ECE F104; placement in ENGL F111X or higher; or permission of instructor. Recommended: Computer with adequate and appropriate software, access to printer, audio conference and internet, and fax machine as needed.*** (2+2)

ECE F110 **Safe, Healthy, Learning Environments**
3 Credits Offered Spring
Establishing and maintaining physically and psychologically safe and healthy learning environments for children. Includes common illnesses, preventive health care, nutritional needs, safety aspects of caring for young children, and Alaska laws and regulations relating to safe and healthy learning environments. Space, relationships, materials and routines are explored as resources for constructing interesting, secure and enjoyable environments that encourage safe and healthy play, exploration and learning. Note: Alternative: ECE F112; ECE F113; ECE F114. (3+0)

ECE F111 **Nutrition for Young Children**
1 Credit Offered Spring
Appropriate ways to meet the nutritional needs of infants and young children, including laws, regulations and appropriate practices relative to food handling service. (1+0)

ECE F112 **Healthy Environments for Young Children**
1 Credit Offered Spring
Establishing and maintaining a physically and psychologically safe environment for children, including common illnesses, preventive health care and Alaska laws and regulations relating to the health of young children. Note: Alternative to ECE F110 when taken with ECE F113 and ECE F114. (1+0)

ECE F113 **Safe Environments for Young Children**
1 Credit Offered Spring
Establishing and maintaining a physically and psychologically safe environment for children, including safety aspects of caring for young children and Alaska laws and regulations relating to safety. Note: Alternative to ECE F110 when taken with ECE F112 and ECE F114. (1+0)

ECE F114 **Learning Environments**
1 Credit Offered Spring
Space, relationships, materials and routines as resources for constructing interesting, secure and enjoyable environments that encourage play, exploration

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and learning. Note: Alternative to ECE F110 when taken with ECE F112 and ECE F113. (1+0)

ECE F115 **Responsive and Reflective Teaching**
3 Credits Offered Fall
How to be ethical, responsive, productive, and well-informed practitioners in the field of early childhood. Emphasis on using traditional and local knowledge and values to inform practice, manage personnel and programs, and provide appropriate services and support to young children and their families. Includes the NAEYC Code of Ethics and NAEYC Standards. Use of observation to transform teaching and management practices. Lab required. This course combines existing courses ECE F171 (1), ECE F172 (1) and ECE F173 (1), and is comparable to ECE F170. Students should take either ECE F115 or ECE F170 or the three one-credit courses (ECE F171, F172, and F173) to meet the practicum and reflection requirement for the Certificate and AAS degree. ***Prerequisites: ECE F101; placement in ENGL F111X or higher; or permission of instructor. Recommended: Computer with adequate and appropriate software, access to printer, audio conference and internet, and fax machine as needed.*** (2+2)

ECE F117 **Math Skills for Early Childhood Educators**
3 Credits Offered Spring
Computation involving percentages, estimation, problem solving, reading and creating graphs and tables, data organization and interpretation. Emphasis on applications of computational skills. Cross-listed with HUMS F117. (3+0)

ECE F118 **Nutrition, Health and Safety**
3 Credits Offered Fall
Establishing and maintaining physically and psychologically safe, healthy, inclusive and appropriate environments for children ages 0-8 that emphasize local and community knowledge. Includes nutrition and safe food handling, common illnesses, preventative health care and safety practices indoors and outdoors. Incorporates laws and regulations relative to course content. Lab required. This course combines existing courses ECE F111, ECE F112 and ECE F113. Students should take either ECE F118 or the three one-credit courses (ECE F111, F112 and F113) to meet the nutrition, health and safety course requirement for the Certificate and AAS degree. ***Prerequisites: ECE F101; placement in ENGL F111X or higher; or permission of instructor. Recommended: Computer with adequate and appropriate software, access to printer, audio conference and internet, and fax machine as needed.*** (2+2)

ECE F120A **Curriculum I**
3 Credits Offered Fall
Curriculum and activities to advance the physical, language and literacy competencies of young children, including teacher techniques and attitudes for establishing integrated, meaningful and relevant experiences within indoor and outdoor environments. Developmentally appropriate methods of facilitating individual and small group experiences, teacher-directed times, transitions and assessment are included. Note: Alternative: ECE F105; ECE F121; ECE F123. (2.5+1)

ECE F120B **Curriculum II**
3 Credits Offered Spring
Curriculum and activities to advance the cognitive development of young children with emphasis on science, math and creativity. Includes a variety of approaches to curriculum development, assessment and necessary skills for early childhood teachers. Note: Alternative: ECE F122; ECE F124; ECE F125. (2.5+1)

ECE F121 **Physical Activities for Young Children**
1 Credit Offered Fall
Essentials of creating an environment which provides space, materials, equipment and activities to promote the physical development of children. Note: Alternative to ECE F120A when taken with ECE F105, ECE F123. (1+0)

ECE F122 **Cognitive Activities for Young Children**
1 Credit Offered Fall
Curriculum planning and facilitation of activities and experiences which encourage questioning, probing and problem-solving skills appropriate for different developmental levels and various learning styles of young children. Note: Alternative to ECE F120B when taken with ECE F124 and ECE F125. (1+0)

ECE F123 **Language and Literature Activities for Young Children**
1 Credit Offered Fall
Curriculum planning and facilitation of activities that help children acquire and use language as a means of communicating their thoughts and feelings. Includes nonverbal communication and understanding of others. Note: Alternative to ECE 120A when taken with ECE F105 and ECE F121. (1+0)

ECE F124 **Creative Activities for Young Children**
1 Credit
Curriculum planning and facilitation of activities which provide a variety of experiences and media that stimulate children to explore and express their creative ability. ***Note: Alternative to ECE F120B when taken with ECE F122 and ECE F125.*** (1+0)

ECE F125 **Math Activities**
1 Credit Offered Spring
Overview of how children construct mathematical meanings. Introduction to mathematical learning principles and experiences for children, 3 - 8 years. Note: Alternate to ECE F120B when taken with ECE F122 and ECE F124. ***Prerequisites: ECE F105 or concurrent enrollment.*** (1+0)

ECE F126 **Activities for School-Age Child Care**
1 Credit Offered as Demand Warrants
For child care staff who work in after-school and/or summer programs. Focus on daily activity schedules and appropriate, fun, challenging activities and projects for young school-age children. (1+0)

ECE F127 **Language and Creative Expression**
3 Credits
Culturally and developmentally appropriate curriculum to promote language and literacy, creativity, and physical development. Emphasis on emergent curriculum, active learning, play observation and creative expression methodologies. Understanding of emergent literacy in young children and how to promote children's development in pre-reading activities. Emphasizes incorporating indigenous knowledge, local materials, resources, elders, artists and parents in addressing language and creative expression development in young children. Lab required. This course combines existing courses ECE F121, ECE F123 and ECE F124, and is comparable to ECE F120A. Students should take either ECE F127 or ECE F120A or the three one-credit courses (ECE F121, F123 and F124) to meet curriculum requirement for the Certificate and AAS Degree. ***Prerequisites: ECE F101; ECE F104 combined with ECE F107 or ECE F245 and ECE F220, ECE F115; placement in ENGL F111X or higher. Recommended: Computer with adequate and appropriate software, access to printer, audio conference and internet, and fax machine as needed.*** (2+2)

ECE F128 **Thinking, Reasoning, and Discovery**
3 Credits
Emphasizes developmentally and culturally appropriate curriculum in the area of cognition. Development and implementation of curriculum that fosters children's development in numeracy, problem solving, intellectually autonomous decision-making, and inquiry in physical and natural sciences based on the individual needs and characteristics of young children. Emphasizes the principles and practices of culturally appropriate, local knowledge and resources being used with young children. Lab required. This course combines existing courses ECE F105, ECE F122 and ECE F125, and is comparable to ECE F120B. Students should take either ECE F128 or ECE F120B or the three one-credit courses (ECE F105, ECE F122 and ECE F125) to meet curriculum requirements for the Certificate and AAS Degree. ***Prerequisites: ECE F101; ECE F104; ECE F107 or ECE F245; ECE F220; ECE F115; placement in ENGL***

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F111X or higher. Recommended: Computer with adequate and appropriate software, access to printer, audio conference and internet, and fax machine as needed. (2+2)

ECE F130 **Culture, Learning and the Young Child**
2 Credits Offered Fall
Ways each child within a culture comes to know, accept and take pride in himself or herself. Maintaining a culturally appropriate, open, friendly and cooperative caring relationship with each child's family. (2+0)

ECE F132 **Young Child and the Family**
1 Credit Offered Spring
Introduction to the importance of a positive and productive relationship between families and the child development centers. Emphasis on using this relationship to coordinate child rearing efforts of both the family and the educator. (1+0)

ECE F135 **Family Day Care Home Provider Training**
1 Credit Offered as Demand Warrants
Operation of safe, successful day care home or family day care program. Overview of laws and regulations, business practices, parental concerns, health and safety, activities, space planning, snack and meal service, community support, and provider concerns. (1+0)

ECE F140 **Positive Social Development**
3 Credits Offered Fall
Classroom management techniques for teachers working with groups of children 3-8 years old. Explores the importance of a strong self-concept and methods for helping children develop positive self-esteem and a pro-social orientation. Includes skills necessary to provide appropriate guidance including: setting limits, use of logical and natural consequences and helping children learn social problem solving, conflict resolution and negotiation. Note: Alternative: ECE F141; ECE F142; ECE F143. (2.5+0.5)

ECE F141 **Class Management**
1 Credit Offered Fall
Classroom management for teachers working with groups of children 3-8 years old. Explores skills needed to provide an environment in which children can begin to learn and practice appropriate and acceptable behaviors as individuals and as a group. Appropriate guidance including: setting limits, use of logical and natural consequences and helping children learn social problem solving, conflict resolution and negotiation. Note: Alternative to ECE F140 when taken with ECE F142 and ECE F143. (1+0)

ECE F142 **Social Development of the Young Child**
1 Credit Offered Fall
Explores skills that help each child feel accepted in the group. Encourages communication empathy and mutual respect among children and adults. Emphasis on methods used to promote pro-social skills such as sharing, making friends, helping children learn social problem solving, conflict resolution and negotiation. Note: Alternative to ECE F140 when taken with ECE F141 and ECE F143. (1+0)

ECE F143 **Developing Positive Self-Concepts in Young Children**
1 Credit Offered Fall
Explores the importance of a strong self-concept and methods for helping children develop positive self esteem. Emphasis on providing success-oriented activities, encouraging acceptance and expression of children's feelings and developing pride as an individual and as a member of a cultural/ethnic group. Note: Alternative to ECE F140 when taken with ECE F141 and ECE F142. (1+0)

ECE F170 **Practicum I**
1-3 Credits
A guided student teaching experience in working with a group of 0-8 year old children. Students apply skill in providing quality early care and education based on the knowledge of early childhood theories and approved practices. Assumes increasing responsibility for planning and lead teaching. Alternative: ECE F171, ECE F172, ECE F173. ***Prerequisites: ECE F101, ECE F110, ECE F120, ECE F140, ECE F245.*** (0.5+0)

ECE F171 **Program Management**
1 Credit Offered as Demand Warrants
The importance of coordination and communication among staff in the classroom. Emphasis on effective group planning, using resources, improving communication, sharing information about children, maintaining records, and establishing and following policies, rules and regulations. Note: Alternative to ECE F170 when taken with ECE F172, ECE F173. (1+0)

ECE F172 **Professionalism**
1 Credit Offered as Demand Warrants
Awareness of one's own personal qualities, feelings, and values that affect the teaching atmosphere; one's relationships with children; one's own teaching style. Note: Alternative to ECE F170 when taken with ECE F171, ECE F173. (1+0)

ECE F173 **Reflective Teaching**
1 Credit Offered as Demand Warrants
Students will develop and expand their capacities to be self-reflective teachers. Promote skills to understand and reflect on early childhood principles, theories and their teaching practices in programs for young children birth to age eight. Note: Alternative to ECE F170 when taken with ECE F171, ECE F172. ***Prerequisites: ECE F101; ECE F110; ECE F120A; ECE F120B; ECE F140; ECE F245.*** (0+3.5)

ECE F210 **Child Development and Guidance**
3 Credits Offered Spring
Guidance and discipline approaches for young children, based on an understanding of child development and of developmentally appropriate education practices. Such an understanding assists teachers and parents in addressing the cause of a behavior problem rather than the symptoms. ***Prerequisites: Placement in ENGL F111X or higher or permission of instructor.*** (3+0)

ECE F220 **Infant and Toddler Care**
3 Credits Offered Spring
Developmentally appropriate care and nurturance of infants and toddlers, with an emphasis on the importance of building relationships. Includes activities to stimulate development and learning and support communication, guidance and health. Demonstration of research-based techniques is integral to the course. Weekly practice labs (14 hours) required. ***Prerequisites: ECE F245 or permission of instructor.*** (2.5+1)

ECE F230 **Introduction to Children with Special Needs**
3 Credits Offered as Demand Warrants
An overview of categories of exceptionality includes hearing and visual impairments; learning, speech and language disabilities; emotional disturbances; physical and mental challenges; and the gifted and talented. ***Prerequisites: ECE F245; placement in ENGL F111X or higher; or permission of instructor.*** (3+0)

ECE F235 **Screening, Assessment and Recording**
2 Credits Offered as Demand Warrants
Information to help teachers of young children understand the purpose of screening. Presents use of good screening procedures. Explores the importance of assessing young children's development and provides tools and practice for recording and evaluating children's progress towards goals. Includes a variety of evaluation tools for assessing young children's development. ***Prerequisites: Placement in ENGL F111X or higher or permission of instructor. Recommended: ECE F105.*** (2+0)

ECE F240 **Inclusion of Children with Special Needs** (s)
3 Credits Offered Fall
Developmental, social, educational and legal (PL94-142 and 99-457) issues related to the education of young children with special needs. Includes the role of the teacher in identifying, assessing and individualizing educational programs for young children with special needs. Emphasis on

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including the children in the least restrictive and most responsive environments. ***Prerequisites: ECE F245; placement in ENGL F111X or higher; or permission of instructor.*** (3+0)

ECE F242 **Child and Family Ecology**
3 Credits Offered as Demand Warrants
Examines the influences the family has on the child, family dynamics and issues impacting families. Focus on the importance of understanding relationship building, support for families and interpersonal skill development that is culturally conducive with individual communities. Examines the ECE program's policies and procedures on families and parental involvement. Includes practical applications of course reading and content. ***Prerequisites: Placement in ENGL F111X or higher or permission of instructor.*** (2.5+1)

ECE F245 **Child Development** (s)
3 Credits
Examination of human relationships with and among children from a multicultural perspective. Includes physical, intellectual, emotional and social development beginning before birth through middle childhood. Requires child observations. Also available through the Center for Distance Education. ***Prerequisites: Placement in ENGL F111X or higher or permission of instructor.*** (3+0)

ECE F249 **Current Issues in Early Childhood Education**
1-3 Credits Offered as Demand Warrants
Selected current issues of importance to the human services, early childhood education or child development and family studies fields. Repeatable for credit by Early Childhood Education and Child Development and Family Studies majors to a maximum of nine credits. (1-3+0)

ECE F270 **Practicum II**
3 Credits
An advanced guided field experience in working with a group of young children in a school or center. May include teaching in a team situation and working with families. ***Prerequisites: ECE F170; placement in ENGL F111X or higher.*** (0.5+0)

ECE F271 **Practicum Seminar**
1 Credit
Seminar to accompany summative practicum ECE F270. Forum for exchange of ideas and reflections on the practicum experience, reading, developmentally and culturally appropriate practices, case studies and development of professional portfolio. ***Co-requisite: ECE F270. Prerequisites: Permission of instructor. Recommended: Completion of all ECE credits towards A.A.S. Degree.*** (1.5+0)

ECE F299 **Practicum for CDAs**
1-3 Credits
A practical application of all previous CDA competency courses. The student will assume responsibility for children in an approved early childhood setting. (CDA curriculum.) ***Prerequisites: Placement in ENGL F111X or higher.*** (0+0)

ECE F301 **Parents as Partners in Education**
3 Credits Offered Spring Odd-numbered Years
Study of strategies that will assist those who work with children and/or families to facilitate supportive partnerships with parents. Includes partnerships, contemporary issues, school and home-based programs, rights and responsibilities, professional ethics, and parents with special or unique needs. ***Prerequisites: ECE F245 or permission of instructor.*** (1.5+3)

ECE F310 **Constructivist Curriculum**
3 Credits Offered Fall Even-numbered Years
A focus on the issues involved in developing constructive curriculum for young children. Includes a foundation in the aims and assumptions of constructivist teaching and key components of this type of curriculum. Emphasis is on best practices for constructivist classrooms. ***Prerequisites: ECE F245; junior standing. Recommended: ECE F130; ECE F210.*** (2.5+1)

ECE F340 **Financial Management of Early Childhood Programs**
3 Credits Offered Fall Odd-numbered Years
The financial aspects of managing a day care center or preschool program. Includes budgeting, program resource management, marketing, purchasing, pay and compensation, and fee collection issues important to maintaining quality programs for young children. ***Prerequisites: ECE F245 or permission of instructor.*** (1+4)

ECE F341 **Personnel Management of Early Childhood Programs**
3 Credits Offered Spring Odd-numbered Years
Management of personnel of child care programs, including recruitment, hiring, in-service training, staff meetings and communication, supervision, evaluation, motivation, burnout prevention and termination of employees. Focus on maintaining quality programs for young children. ***Prerequisites: ECE F245 or permission of instructor.*** (1.5+3)

ECE F342 O **Family Relationships**
3 Credits Offered Fall
Examination of relationships in contemporary family life. Focus on the changing family, gender roles, living together, and relationships with children and grandchildren. Includes current family research and issues within and effect of public policy on families in our multicultural society. ***Prerequisites: COMM F131X or COMM F141X; upper-division standing; or permission of instructor.*** (3+0)

ECE F350 **Play: Foundation for Development** (s)
3 Credits Offered as Demand Warrants
Concepts, theories and empirical research on the role of the play in the total development of children. Utilizing three major ideas — the effective quality of play in early childhood development, as a means of self-expression, and as a channel of communication. Examines the effects culture, media and technology have on play. Includes roles of early care-giving staff, teachers, and parents in supporting appropriate play experiences. ***Prerequisites: ENGL F211X or F213X; ECE F107; ECE F245; or approved development class.*** (3+0)

ECE F360 **Assessment in Early Childhood**
3 Credits Offered Spring Even-numbered Years
Examination of policies and practices related to evaluation and assessment of young children's progress. Includes legal, ethical and professional responsibilities in assessment. Exploration of "what, when, why and how" to assess young children. Includes practice and analysis of various assessment styles and tools as well as how to use information gained through assessment. ***Prerequisites: ECE F130; ECE F230; ECE F240; ECE F245; junior standing. Recommended: ECE F210.*** (2.5+1)

ECE F420 W **Developing Literacy in the Early Years**
3 Credits Offered Fall
Principles and practices in understanding and supporting young children's emerging literacy. Links the importance of oral language and early exploration with later reading and writing skills. Strategies for assisting emergent readers and writers are included, as well as how to use play and children's interests to assist in developing their literacy. ***Prerequisites: ECE F310; ECE F360; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; upper-division standing.*** (3+0)

ECE F430 **Fine Arts for the Early Years** (h)
3 Credits Offered Spring Odd-numbered Years
Focused on promoting the arts in children's lives. Explores the role of the teacher in helping children become aware of the beauty around them and to appreciate the variety and skill of many different kinds of art including: theatre, two- and three-dimensional art, crafts, vocal and instrumental music and dance. Strategies for assessing artistic development and working with families are incorporated. ***Prerequisites: ECE F310; completion of at least one humanities course; upper-division standing.*** (3+0)

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ECE F440 **Exploring Math and Science**
3 Credits Offered Fall Odd-numbered Years
Focused on constructivist teaching of math and science. Explores the role of the teacher in helping children become theory builders in an environment designed to promote learning in math and science. Includes specific examples in chemistry, biology, ecology, numbers, patterns, geometry, measurement and data analysis. Emphasis is on teaching children an interactive, analytic and reflective process of inquiry. ***Prerequisites: ECE F310; ECE F360; upper-division standing. Recommended: Completion of at least one natural science course.*** (2.5+1)

ECE F442 **Family Resource Management**
3 Credits Offered Spring Even-numbered Years
Management of resources which help families meet and alter the increasing complexities of life. Involves purposeful actions that affect the use of time, money, energy, skills, talents and knowledge. Explores roles, goals and decision-making within our multicultural society throughout the life cycle. ***Prerequisites: ECE F245 or PSY F240; upper-division standing; or permission of instructor.*** (1.5+3)

ECE F445 W **Adolescence through the Lifespan**
3 Credits Offered Spring Odd-numbered Years
Study of the inter-relationships between early childhood and future development from adolescence through adulthood. Achievement in school, anorexia, chemical dependency and other health issues, family happiness, personal confidence and career success have all been linked to the early years. This course helps students understand these vital connections. ***Prerequisites: ECE F245; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; junior standing.*** (2.5+1)

ECE F470 **Advanced Practicum**
3 Credits Offered as Demand Warrants
Advanced practicum requiring 200 hours of work in an early childhood program or family support agency as a teacher, curriculum specialist, family advocate or in another related position. A capstone course available only to those who have completed the other required course work for the B.A. in Child Development and Family Studies degree and their designated specialty. ***Prerequisites: Senior standing; permission of instructor.*** (2.5+1)

ECONOMICS

Students enrolling in School of Management courses are expected to have completed the necessary prerequisites for each course.

A per semester student computing facility user fee will be assessed for student enrolling in one or more School or Management courses (AIS, ACCT, BA and ECON) except ECON F100X. This fee is in addition to any materials fees.

ECON F100X **Political Economy** (s)
3 Credits
Survey of the evolution and operation of the American domestic political economy with consideration of market failures and government responses. Review of major issues in political economy such as inflation, poverty and budget deficits. Exploration of linkages between American and global systems. Also available through the Center for Distance Education. ***Prerequisites: Placement in ENGL F111X or higher or permission of instructor.*** Cross-listed with PS F100X. (3+0)

ECON F111 **Economics of Rural Alaska**
3 Credits Offered as Demand Warrants
Basic economic concepts as they relate to issues and problems of contemporary regional development in rural Alaska. Socioeconomic consequences of the introduction of new technologies, modern economic intra-structures and corporate relationships to traditional, small scale communities. (3+0)

ECON F200 **Principles of Economics** (s)
4 Credits
Goals, incentives and outcomes of economic behavior with applications and illustrations from current issues: operation of markets for goods, services and factors of production; the behavior of firms and industries in different types of competition; and income distribution. The functioning and current problems of the aggregate economy, determination and analysis of aspects of international exchange. Also available through the Center for Distance Education. ***Prerequisites: MATH F107X or MATH F161X.*** (4+0+1)

ECON F201 **Principles of Economics I: Microeconomics** (s)
3 Credits
Price and market theory, income distribution, public policy, labor markets, market structure, and externalities. (3+0)

ECON F202 **Principles of Economics II: Macroeconomics** (s)
3 Credits
Analysis and theory of national income, money and banking, stabilization policy, and international trade and finance. (3+0)

ECON F227 **Intermediate Statistics for Economics and Business**
3 Credits
Extension of topics developed in STAT F200X. Development of statistical techniques and their application to economic and business problems. Simple and multiple regression and correlation, analysis of variance, forecasting techniques, quality control, nonparametric methods and decision theory. ***Prerequisites: AIS F101 or equivalent; STAT F200X; or permission of instructor.*** (3+0)

ECON F235 **Introduction to Natural Resource Economics** (s)
3 Credits Offered Fall
Microeconomic principles and their application to natural resource issues. Topics include supply, demand, marginality, optimality, elementary production economics, economic rent and comparative advantage. These principles applied to agency budget allocation decisions, multiple use, resource valuation, conservation, market failure and public outdoor recreation problems. (3+0)

ECON F237 **The Alaskan Economy** (s)
3 Credits Offered Spring
Economic problems in Alaska with analysis of historical trends and current patterns of economic growth; emphasis on present and future alternative economic policies and their potential impacts. Also available through the Center for Distance Education. (3+0)

ECON F321 **Intermediate Microeconomics** (s)
3 Credits
Analysis of demand and supply under various market forms, cost and theory of production, factor pricing and theory of distribution, and survey of welfare economics. ***Prerequisites: ECON F200; MATH F262X or equivalent.*** (3+0)

ECON F322 **Managerial Economics**
3 Credits Offered Fall or Spring
Interpretation of economic data and applications of economic theory in business firms. Bridging the gap between theory and practice through empirical studies, cases and decision problems. Emphasis upon decision-making using analysis of research data. ***Prerequisites: ECON F200; MATH F262X or equivalent.*** (3+0)

ECON F324 **Intermediate Macroeconomics** (s)
3 Credits Offered Fall or Spring
Concepts and measurement of income, analysis of aggregate demand and supply and their relation to the level of prices, employment and economic growth. ***Prerequisites: ECON F200.*** (3+0)

ECON F335 O **Intermediate Natural Resource Economics** (s)
3 Credits Offered Fall or Spring
Extension of concepts developed in ECON F235, using a higher level of economic analysis. Topics include welfare economics and economic efficiency

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concepts, benefit/cost analysis, resource allocation over time, resource taxation, common property problems, externalities, public goods, valuation of non-market resources, and land use planning issues. ***Prerequisites: COMM F131X or COMM F141X; ECON F200 or ECON F235; MATH F262X or equivalent.*** (3+0)

ECON F350 **Money and Banking** (s)
3 Credits Offered Fall or Spring
The liquid wealth system in the United States, including the commercial banking system, the Federal Reserve System and nonbank financial institutions; the regulation of money and credit and its impact on macroeconomic policy objectives. Also available through the Center for Distance Education. ***Prerequisites: ECON F200.*** (3+0)

ECON F351 **Public Finance** (s)
3 Credits Offered Fall Odd-numbered Years
Economic justifications for government; federal, state and local government, taxation, spending and debt; their effects on allocation, distribution, stabilization and growth. ***Prerequisites: ECON F200.*** (3+0)

ECON F420 W **Labor Markets and Public Policy** (s)
3 Credits Offered Spring Odd-numbered Years
Application of labor market analysis and wage theory as they relate to public policy issues. Topics include determination of wages, taxation and employment, economic impact of unions, economics of discrimination, and issues relating to women's and minorities' changing roles in the labor market. ***Prerequisites: ECON F200; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (3+0)

ECON F434 W **Environmental Economics**
3 Credits Offered Spring Odd-numbered Years
An extension of concepts introduced in ECON F235, using a higher level of economic analysis. An analysis of the economic forces involved in environmental degradation, preservation and regulation. Topics include pollution, biodiversity, wilderness and climatic change. ***Prerequisites: ECON F200 or ECON F235; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; MATH F262X or equivalent.*** (3+0)

ECON F439 W **Energy Economics** (s)
3 Credits Offered Fall Odd-numbered Years
Market forces and institutions affecting the allocation of energy resources. Special attention to intertemporal allocative decisions and the role that public policy plays in influencing the rate at which energy resources are used over time. ***Prerequisites: ECON F200 or ECON F235; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** Stacked with ECON F639. (3+0)

ECON F451 W **Public Expenditure Analysis**
3 Credits Offered Spring Odd-numbered Years
Purposes and economic effects of governmental expenditures, budgeting techniques, and their effects on resource allocation. ***Prerequisites: ECON F200; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; MATH F262X or equivalent.*** (3+0)

ECON F463 W **International Economics** (s)
3 Credits Offered Fall or Spring
Pure theory of international trade: comparative cost, terms of trade, and factor movements. International disequilibrium: balance of payments and its impact on national economy, capital movement and economic development through international trade. ***Prerequisites: ECON F200; ENGL F111X; ENGL F211X or F213X or permission of instructor; MATH F262X or equivalent.*** (3+0)

ECON F601 **Microeconomic Theory I**
3 Credits Offered Fall
Analysis of consumer and producer theory, price determination and welfare economics. ***Prerequisites: ECON F321 or equivalent; MATH F200X or equivalent; graduate standing; or permission of instructor.*** (3+0)

ECON F602 **Economic Modeling**
3 Credits Offered Fall
A hands on approach to applied microeconomics and resource modeling. Students extend their training in economic theory and econometrics to model real life problems in the areas of renewable and exhaustible resources, non-market valuation and environmental economics. Special emphasis will be given to the use of econometric analyses. ***Prerequisites: ECON F601; ECON F626 or equivalent; graduate standing; or permission of instructor.*** (3+0)

ECON F603 **Macroeconomic Theory I**
3 Credits Offered Spring
Analysis of the underlying causes of unemployment, economic instability, inflation and economic growth. ***Prerequisites: ECON F321 or equivalent; ECON F324 or equivalent; MATH F200X or equivalent; graduate standing; or permission of instructor.*** (3+0)

ECON F613 **Resilience Internship**
2 Credits Offered Fall
Students of the Resilience and Adaptation Program participate in internships to broaden their interdisciplinary training, develop new research tools and build expertise outside their home disciplines. Internships are eight to ten weeks of full time commitment and take place during the student's first summer in the program. In the autumn students meet to discuss their internship experiences and make public presentations. ***Prerequisites: ANTH/BIOL/ECON/NRM F667; ANTH/BIOL/ECON/NRM F668; or permission of instructor.*** Cross-listed with ANTH F617; BIOL F613; NRM F613. (2+0)

ECON F616 **Economics Background for Resilience and Adaptation**
1 Credit Offered Fall
Provides the economics background that is necessary for understanding the role of economics in complex systems involving interactions among biological, economic, and social processes. Designed for incoming students of the Resilience and Adaptation Program (RAP), who have not received training in ecology. Graded Pass/Fail. ***Prerequisites: Graduate student enrollment or permission of instructor.*** (1+0)

ECON F621 **Fundamentals of Economics**
3 Credits Offered Spring
Analysis of demand and supply under various market forms, cost and theory of production, factor pricing and theory of distribution and survey of welfare economics. ***Prerequisites: Graduate standing or permission of MBA Director.*** (3+0)

ECON F623 **Mathematical Economics**
3 Credits Offered Fall
Mathematical techniques including matrix algebra, differential and integral calculus. Particular attention is given to static and comparative statics analysis and dynamic models. ***Prerequisites: MATH F200X or equivalent; graduate standing; or permission of instructor.*** (3+0)

ECON F626 **Econometrics**
3 Credits Offered Spring
Introduction to econometric theory. Single equation and multiple equation system estimation, including inference and hypothesis testing and results of assumption violation. ***Prerequisites: ECON F227 or equivalent; MATH F200X or equivalent; STAT F401; graduate standing; or permission of instructor.*** (3+0)

ECON F627 **Advanced Econometrics**
3 Credits Offered Fall
Advanced Econometrics is the second graduate econometrics course in the Ph.D. in Resource Economic program. This course builds upon the theoretical and empirical tools developed in ECON F626. Large sample theory and the Maximum Likelihood estimation theory are covered. Limited dependent variable models widely used in applied microeconometric modeling are developed and extended. Univariate and multivariate time series modeling and forecasting is developed. ***Prerequisites: ECON F626 or equivalent; graduate standing; or permission of instructor.*** (3+0)

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ECON F628 **Analytical Methods for Economics and Business**
3 Credits Offered Spring
Covers the important analytical management tools and techniques and their application to business problems. In particular, we will cover both mathematical and statistical techniques that have direct applications in a variety of management situations. This course will serve as a foundation course for the MBA program. ***Prerequisites: Graduate standing or permission of M.B.A. Director.*** (3+0)

ECON F635 **Renewable Resource Economics**
3 Credits Offered Fall
The theory, methods of analysis and current literature of natural resource economics and policy for fisheries, forests and wildlife. Topics include externalities, property rights, public goods, benefit-cost analysis, amenity values and other non-market resource services, and environmental policy. ***Prerequisites: ECON F321; ECON F335 or equivalent; MATH F200X or equivalent; graduate standing; or permission of instructor.*** (3+0)

ECON F636 **Non-Renewable Resource Economics**
3 Credits Offered Spring
Exploration of issues relating to the mineral and energy markets. The analysis of energy and mineral use over time, capital investment problems and world market dynamics are explored. Topics include futures markets, present value, energy value and entropy. ***Prerequisites: ECON F321; ECON F335 or equivalent; MATH F200X or equivalent; graduate standing; or permission of instructor.*** (3+0)

ECON F637 **Evolution of Conservation Concepts and Policy**
3 Credits Offered Spring
Resource policy issues development and implementation including forestry, mining, fisheries, oil, wildlife and other topics as demand warrants. Focus on policy issues involved in management of Alaska's resources. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with NRM F637. (3+0)

ECON F639 **Energy Economics**
3 Credits Offered Fall Odd-numbered Years
Market forces and institutions affecting the allocation of energy resources. Special attention to intertemporal allocative decisions and the role that public policy plays in influencing the rate at which energy resources are used over time. ***Prerequisites: ECON F200 or ECON F235; graduate standing; or permission of instructor.*** Stacked with ECON F439. (3+0)

ECON F647 **Global to Local Sustainability**
3 Credits Offered Fall
Explores the basic principles that govern resilience and change of ecological and social systems. Principles are applied across a range of scales from local communities to the globe. Working within and across each of these scales, students address the processes that influence ecological, cultural and economic sustainability, with an emphasis on northern examples. ***Prerequisites: Graduate standing in a natural science, social science, humanities or interdisciplinary program at UAF; permission of instructor.*** Cross-listed with ANTH F647; BIOL F647; NRM F647. (3+0)

ECON F649 **Integrated Assessment and Adaptive Management**
3 Credits Offered Spring
Interdisciplinary exploration of theoretical and practical considerations of integrated assessment and adaptive management. Students survey concepts important in understanding societal and professional-level decision-making. Students work as individuals and as a team to undertake case studies with relevance to integrated assessment and adaptive management. Collectively, the class builds a portfolio of cases and conducts an integrated assessment. Note: In case of enrollment limit, priority will be given to graduate students in the Resilience and Adaptation Program in order for them to be able to meet their core requirement. ***Prerequisites: Graduate student standing in a natural science, social science, humanities or interdisciplinary program at UAF or another university, or permission of instructor. The course is designed to fit into the sequence of the Resilience and Adaptation program's core courses. It is open to other graduate students interested in and prepared to conduct interdisciplinary studies relating to sustainability. Recommended: ANTH/BIOL/ECON/NRM F647; ANTH/BIOL/ECON/NRM F648 and ANTH/BIOL/ECON/NRM F667 previously or concurrently.*** Cross-listed with ANTH F649; BIOL F649; NRM F649. (3+0)

ECON F667 **Resilience Seminar I**
1 Credit Offered Fall
Provides a forum for new students of the Resilience and Adaptation graduate program to explore issues of interdisciplinary research that are relevant to sustainability. A considerable portion of the seminar is student-directed, with students assuming leadership in planning seminar activities with the instructor. Graded Pass/Fail. ***Prerequisites: Enrollment in Resilience and Adaptation graduate program or have permission of instructor. Recommended: ANTH/BIOL/ECON/NRM F647 taken concurrently.*** Cross-listed with ANTH F667; BIOL F667; NRM F667. (2+0)

ECON F668 **Resilience Seminar II**
1 Credit Offered Spring
Provides a forum for new students of the Resilience and Adaptation graduate program to explore issues of interdisciplinary research that are relevant to sustainability. The seminar provides support to each student planning his/her summer internship and preparing and presenting a thesis research prospectus. Graded Pass/Fail. ***Prerequisites: ANTH/BIOL/ECON/NRM F647; ANTH/BIOL/ECON/NRM F667; or permission of instructor.*** Cross-listed with ANTH F668; BIOL F668; NRM F668. (2+0)

ECON F670 **Seminar in Research Methodology**
1 Credit Offered Spring
Philosophy of research and importance of the scientific method to solution of research problems. Graded Pass/Fail. ***Prerequisites: Graduate standing.*** (1+0)

EDUCATION

ED F100 **Language, Education, Linguistics** (h)
3 Credits Offered Spring
Introduction to the field of linguistics as it pertains to the field of education. Includes discussions of language structure, acquisition and bilingualism, and variation and public policy. The course does not satisfy requirements for the B.A. in Linguistics. Cross-listed with LING F100. (3+0)

ED F102 **Orientation to Alaska Native Education**
2 Credits
A seminar in issues related to Alaska Native and rural education. Through weekly meetings held both on campus and in Fairbanks schools, students examine and discuss issues with Alaska Native educators on topics related specifically to rural and urban Alaska Native education. Issues include: Native ways of knowing, local control, curriculum development for small/multi-graded/rural schools, cultural differences in teaching and learning, and bilingual programs. Graded Pass/Fail. ***Prerequisites: Permission of instructor.*** Cross-listed with ANS F102. (2+0)

ED F110 **Becoming a Teacher in the 21st Century**
1 Credit
Series of seminars focusing on current national educational policies and practices. Includes exploration of teaching as a profession. Presented in the Alaska context, seminars include opportunity for interaction with Alaska teachers, student teachers and interns. Graded Pass/Fail. (1+0)

ED F201 **Introduction to Education**
3 Credits
Introduction to the profession of education and specifically, the field of teaching. Review of social, political, cultural and historical factors that influence education and schools at the national and Alaska state level. Field experience required. ***Prerequisites: ED F110; ENGL F111X; sophomore standing; or permission of instructor.*** (3+0)

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ED F204 Literature for Children
3 Credits
Examination of effective uses of literature to promote learning. Critical analysis of authors, illustrators and content of children's literature representative of multiple genres and diverse peoples and perspectives — including Alaska literature. Review of criteria for book selection and application of review process to books selected by students based on professional recommendations and reviews. Field experience required. ***Prerequisites: ED F201.*** (3+0)

ED F237A Technology Tools for Teachers: Graphical Organizers
0.5 Credit Offered Fall, Spring, As Demand Warrants
Designed to equip pre-service teachers with the necessary technology skills to be successful in their pre-service programs. Successful challenge or completion of all modules is a prerequisite for ED F429. May be repeated once for credit. Each module will require approximately 6 hours of direct instruction and 4-8 hours of lab work. It is divided into 4 separate modules. This module covers creating outlines and diagrams, concept maps, exporting to other applications (requires Inspiration). Graded Pass/Fail. (0.5+2)

ED F237B Technology Tools for Teachers: Publishing
0.5 Credit Offered Fall, Spring, As Demand Warrants
Designed to equip pre-service teachers with the necessary technology skills to be successful in their pre-service programs. Successful challenge or completion of all modules is a prerequisite for ED F429. May be repeated once for credit. Each module will require approximately six hours of direct instruction and four to eight hours of lab work. It is divided into four separate modules. This module covers publishing: word processing, graphics and page layout. Graded Pass/Fail. (0.5+2)

ED F237C Technology Tools for Teachers: Presentations
0.5 Credit Offered Fall, Spring, As Demand Warrants
Designed to equip pre-service teachers with the necessary technology skills to be successful in their pre-service programs. Successful challenge or completion of all modules is a prerequisite for ED F429. May be repeated once for credit. Each module will require approximately six hours direct instruction and four to eight hours of lab work. It is divided into four separate modules. This module covers presentation/graphical organizers: PowerPoint and Inspiration. Graded Pass/Fail. (0.5+2)

ED F237D Technology Tools for Teachers: Spreadsheets/ Databases
0.5 Credit Offered Fall, Spring, As Demand Warrants
Designed to equip pre-service teachers with the necessary technology skills to be successful in their pre-service programs. Successful challenge or completion of all modules is a prerequisite for ED F429. May be repeated once for credit. Each module will require approximately six hours of direct instruction and four to eight hours of lab work. It is divided into four separate modules. This module covers spreadsheets/databases: databases (Appleworks, Access) and spreadsheets (Excel). Graded Pass/Fail. (0.5+2)

ED F245 Child Development
3 Credits
A study of the physical, cultural, emotional, cognitive and social aspects of a child's development from prenatal period through early adolescence. Focus on developmental theories including Erickson, Gardner, Gilligan, Kagen, Sternberg, Vygotsky and other contemporary theories of child and adolescent development. ***Prerequisites: PSY F101 or permission of instructor.*** Cross-listed with PSY F245. (3+0)

ED F303 W,O Language Acquisition
3 Credits Offered as Demand Warrants
Theories of the acquisition and development of first and second languages, including consideration of biological and sociocultural factors. Survey of traditional and contemporary theories, and implications for pedagogy and public policy. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor. Recommended: LING F101.*** Cross-listed with LING F303. (3+0)

ED F309 Elementary School Music Methods
3 Credits Offered Fall Even-numbered Years
Principles, procedures and materials for teaching music to children at the elementary level. Cross-listed with MUED F309. (3+0)

ED F329 Teaching with Technology
3 Credits
Participants will examine multiple strategies for the effective use of computers and related technologies in the classroom. Emphasis will be on the use of mainstream cross-platform productivity applications to develop understanding of the schemes for using databases, spreadsheets, page layouts, digital video, presentations and graphical organizers in transformed instructional settings. Students must have access to Word, PowerPoint, Excel, and Inspiration. ***Prerequisites: ED F237 or passing the equivalent competency test, or permission of instructor; laptop computer required.*** (3+0)

ED F330 Assessment of Learning
3 Credits
Review and examination of the range of traditional and alternative assessment and evaluation approaches used in educational contexts. Focus is on developing assessment practices and policies that are appropriate for the diverse student population in Alaska's rural and urban schools. Field experience required. ***Prerequisites: ED F201; a mathematics baccalaureate core course; or permission of instructor.*** (3+0)

ED F344 W Foundations of Literacy Development
3 Credits
Language, reading, and writing development examined in children of varying ages and within a range of social and cultural contexts, with emphasis on a developmental approach to literacy development in school and home settings. Introduction to best practices in research-based methods for teaching and learning of reading and writing. Field experience required. ***Prerequisites: ED F201; ED F204; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; upper-division standing; laptop computer required.*** (3+0)

ED F345 Sociology of Education (s)
3 Credits Offered Fall Odd-numbered Years
Theoretical perspectives on various dimensions of the relationship between education and society, including the institutional context for schooling, the impact of schooling on social stratification and social organization within the school and classroom. Special attention is given to issues of equity and contemporary education reform efforts. ***Prerequisites: SOC F100X or permission of instructor.*** Cross-listed with SOC F345. (3+0)

ED F350 Communication in Cross-Cultural Classrooms
3 Credits
Interdisciplinary examination of communication and language in cross-cultural educational contexts, including language, literacy and interethnic communication related to classrooms in Alaska. ***Prerequisites: ED F201.*** (3+0)

ED F370 Issues in Alaska Bilingual and Multicultural Education
1 Credit Offered as Demand Warrants
Current issues related to Alaska bilingual and multicultural education. Students must attend all three days of the annual Alaska Bilingual/Multicultural Education and Equity Conference and write a paper reflecting on how they will use information gained from the conference in their own multicultural education context. Course may be repeated for credit since the content of the conference changes each year. Graded Pass/Fail. ***Prerequisites: Prior course work at the lower-division level.*** Cross-listed with ANS F370. (1+0)

ED F380 Cultural Influences in Education
3 Credits Offered as Demand Warrants
Interdisciplinary study of the educational problems, concerns and successes in a variety of cultural contexts. Social, cultural and psychological factors inherent in the educational process and how they are affected by a multicultural setting. Attention given to curriculum improvement and teaching strategies appropriate for the multicultural classroom and school. ***Prerequisites: Junior standing.*** (3+0)

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ED F385 **International Perspectives on Education**
3 Credits Offered as Demand Warrants
A comparative analysis of the influences of changing political, social and economic conditions and relationships with other countries in the world on U.S. and Alaska education policies. Examination of school systems in several industrialized and developing countries with focus on understanding Alaska's educational system within the context of this wider global community. ***Prerequisites: Junior standing.*** (3+0)

ED F411 **Reading, Writing, Language Arts: Methods and Curriculum Development**
3 Credits Offered Fall
Study and application in the classroom of best practices from research-based strategies for the teaching and learning of reading, writing and language arts concepts. Includes content and methods for students in elementary classrooms with diverse populations. Requires development and classroom implementation of integrated reading and writing unit. Concurrent internship required. ***Prerequisites: Admission to Internship Year.*** (3+0)

ED F412 W **Integrated Social Studies and Language Arts: Methods and Curriculum Development**
3 Credits Offered Fall
Study and application in the classroom of best practices from research-based strategies for the teaching and learning of social studies concepts, content, and methods integrated with language arts for students in elementary classrooms with diverse populations. Requires development and classroom implementation of integrated social studies and language arts unit. Concurrent internship required. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; admission to Internship Year.*** (3+0)

ED F414 **Art, Music and Drama in Elementary Classrooms**
2 Credits Offered Spring
Exploration and application, in the classroom, of theory, practice, methods and materials used in teaching in and through visual art, music and drama. Concurrent internship required. ***Prerequisites: Admission to the Internship Year.*** (1+2)

ED F417 **Physical and Health Education for Elementary Teachers**
2 Credits
Introduction and application of the relationship between physical fitness and good health in a school setting. Includes introducing students to fundamental movement activities and games. Includes incorporating health curriculum and first aid procedures into practices and policies, and issues specific to the Alaska context. Concurrent internship required. ***Prerequisites: Admission to the Internship Year.*** (1+2)

ED F420 **Alaska Native Education** (s)
3 Credits Offered Fall
School systems historically serving Native people, current efforts toward local control, and the cross-cultural nature of this education. Field experience required. ***Prerequisites: ANTH F242 or permission of instructor.*** Cross-listed with ANS F420. Stacked with ED F606. (3+0)

ED F440 **Gender and Education** (s)
3 Credits Offered Spring Even-numbered Years
Educational practices and processes and their relation to the changing situation of women in society. Examination of schools as sites of pervasive gender socialization and discrimination as well as offering new possibilities for liberation. Topics include social construction of gender, patterns of access and achievements, gender as an organizing principle in schools and classrooms, and feminist agendas and strategies for change. ***Prerequisites: Junior standing or permission of instructor.*** Cross-listed with WMS F440. Stacked with ED F640. (3+0)

ED F449 **Elementary Art Methods**
3 Credits Offered Spring
Methodologies of instruction and assessment in art education at the elementary level. Focus is on the knowledge and tools necessary to become excellent elementary art educators. Students will be expected to construct lessons reflecting theory and practice that are developmentally appropriate for elementary level students of all ages. Particular attention will be given to using and understanding the National Standards for Art Education, Alaska Content/Performance Standards, and key curriculum documents in an elementary context. ***Prerequisites: Admission to K-12 Art post-baccalaureate licensure program or to M.Ed. in Curriculum and Instruction option for post-baccalaureate students.*** Stacked with ED F649. (3+0)

ED F450 **Education and Cultural Transmission**
3 Credits Offered as Demand Warrants
Education as a process for transmitting culture with examination of issues related to cultural transmission in a multicultural environment. Emphasis on dynamics of cultural change. ***Prerequisites: Junior standing.*** (3+0)

ED F451 **Practicum in Education**
1-9 Credits
Practical application of general ideas and techniques addressed in methods courses in which the student is currently enrolled or previously completed. ***Prerequisites: Permission of Office of Practical Experiences.*** (0+0)

ED F452 O **Elementary Internship**
3-15 Credits
Supervised teaching in elementary schools approved by the School of Education. Students should expect to be involved in the school setting for some or all of the school day (depending on number of credits taken) for the entire university semester. The School of Education may limit enrollment, determine assignments and cancel the registration of students doing unsatisfactory work. Graded Pass/Fail. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; successful completion of methods practicum and methods course work with a C or better. Post-baccalaureate students must be admitted to the Art K-12 licensure program. Passing Praxis I scores.*** Cross-listed with ART F458. (1+0+42)

ED F453 O **Secondary Internship**
3-15 Credits
Supervised teaching in secondary schools approved by the School of Education. Students should expect to be involved in the school setting for some or all of the school day (depending on number of credits taken) for the entire university semester. The School of Education may limit enrollment, determine assignments and cancel the registration of students doing unsatisfactory work. Graded Pass/Fail. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; and successful completion of methods practicum and methods course work with a C or better. Post-baccalaureate students must be admitted to K-12 Art licensure program. Passing Praxis I scores.*** Cross-listed with ART F459. (1+0+42)

ED F454 O **Student Teaching K-12**
15 Credits
Supervised teaching in both elementary and secondary schools approved by the department of education. Open only to Music and P.E. majors seeking K-12 certification or to graduate students seeking K-12 small school certification. Students should expect to be involved in the school setting for the entire school day for the entire university semester. The department may limit enrollment, determine assignments and cancel the registration of students doing unsatisfactory work. Graded Pass/Fail. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X, successful completion of methods practicum and methods course work with a C or better. Passing Praxis scores. For Bachelor of Music students, see B.M. degree requirements.*** (1+0+42)

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ED F456 **Orientation to Teaching in Rural Alaska**
3 Credits Offered Summer, As Demand Warrants
Needs of rural schools, their environments and the recipients of school services with special attention given to cross-cultural educational issues. ***Prerequisites: Permission of instructor.*** (2+3)

ED F461 **Native Ways of Knowing** (h)
3 Credits Offered Spring
Focus on how culture and worldview shape who we are and influence the way we come to know the world around us. Emphasis on Alaska Native knowledge systems and ways of knowing. ***Prerequisites: Junior standing.*** Cross-listed with ANS F461. (3+0)

ED F462 **Alaskan Environmental Education**
3 Credits Offered as Demand Warrants
Utilization of the environment inside and outside the formal classroom in all subject areas. Curriculum materials (K-12), interpretive and audiovisual aids, problem solving and applications to situations from the public schools to summer campus, short courses and workshops for individuals of any age. ***Prerequisites: Junior standing.*** Cross-listed with NRM F462. (3+0)

ED F465 **Working with FAS/FAE Children**
3 Credits Offered Fall
For families of children with FAS/FAE and professionals — teachers, social workers and health workers who deal with these children. Guest speakers, interviews and reading materials. Project is the development of activities to use with these children with FAS/FAE. Access to work in a school setting required. (Not available on Fairbanks campus.) (2+4)

ED F466 **Internship and Collaborative Student Teaching**
3 Credits Offered Fall
Supervised internship for students in the first half of a year-long professional internship in elementary teacher education. Includes immersion in planning and teaching. Course work is integrated into the internship experience. Interns are assessed in relationship to UAF/Alaska state and national standards. Graded Pass/Fail. Special fees apply. ***Prerequisites: Admission to Internship Year.*** (1+0+25)

ED F467 **Synthesizing the Standards I**
1 Credit Offered Fall
For student interns participating in the first half of the professional internship year. Interns use the UAF/Alaska Teacher Standards as the basis for examining field- and course-based experiences and activities during the internship year. Includes collection and analysis of selected artifacts to document and provide evidence of professional development and achievement relative to educational standards. Interns present portfolio for midyear assessment. Concurrent internship required. ***Prerequisites: Admission to Internship Year.*** (1+0)

ED F468 O **Internship and Student Teaching**
6 Credits Offered Spring
For student interns participating in the second half of the year-long professional elementary teacher education internship. Interns must spend at least four days per week in the classroom, one month full-time in the classroom including at least three weeks of full responsibility for the classroom. Builds on ED F466 requirements with continued assessment based on UAF/ Alaska State and National Standards. Graded Pass/Fail. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; admission to the Internship Year.*** (1+0+40)

ED F469 **Portfolio Development II**
2 Credits Offered Spring
For student interns participating in the second half of the professional internship year. Interns use the UAF/Alaska Teacher Standards as a basis for examining field- and course-based experiences and activities during the internship year. Includes collection and analysis of selected artifacts to document and provide evidence of professional development and achievement relative to educational standards. Interns formally present completed portfolios for reviews and evaluations. Concurrent internship required. ***Prerequisites: Admission to the Internship Year.*** (2+0)

ED F478 **Math Methods and Curriculum Development**
2 Credits Offered Fall
Study and application in the classroom of best practices from research-based strategies for the teaching and learning of mathematical concepts, content and methods for students in elementary classrooms with diverse populations. Requires development and classroom implementation of mathematics unit. Concurrent internship required. ***Prerequisites: Admission to Internship Year.*** Stacked with ED F678. (2+0)

ED F479 **Science Methods and Curriculum Development**
2 Credits Offered Spring
Study and application in the classroom of the best practices from research-based strategies for the teaching and learning of science concepts, content and methods for students in elementary classrooms with diverse populations. Requires development and classroom implementation of science unit. Classroom internship required. ***Prerequisites: Admission to internship year; concurrent enrollment in other internship year courses; Alaska passing scores for three Praxis I exams.*** Stacked with ED F688. (2+0)

ED F486 O/2 **Media Literacy** (h)
3 Credits
Promotes critical thinking skills that empower people to make independent judgments and informed decisions in response to information conveyed through the channels of mass communications. Emphasis on developing students and others into critical viewers, listeners and readers of media. Also available through the Center for Distance Education. ***Prerequisites: COMM F131X or COMM F141X; junior standing; laptop computer.*** (3+0)

ED F601 **Introduction to Applied Social Science Research**
3 Credits
Review of the most common educational research paradigms, data gathering techniques and analytical tools used in the study of human behavior and educational institutions. Attention will be given to collaborative research models, with a focus on the translation of research results into practical application. (3+0)

ED F603 **Field Study Research Methods**
3 Credits
Focus on techniques for conducting both quantitative and qualitative field research. Particular emphasis on considerations for conducting field research in cross-cultural settings. ***Prerequisites: ED F601.*** Cross-listed with CCS F603. (3+0)

ED F604 **Documenting Indigenous Knowledge**
3 Credits Offered Fall
A thorough grounding in research methodologies and issues associated with documenting and conveying the depth and breadth of indigenous knowledge systems and their epistemological structures. Includes a survey of oral and literate data-gathering techniques, a review of various modes of analysis and presentation, and a practical experience in a real-life setting. ***Prerequisites: Graduate standing or approval of the instructor.*** Cross-listed with: CCS F604. (3+0)

ED F606 **Alaska Native Education**
3 Credits Offered Fall
School systems historically serving Native people, current efforts toward local control and the cross-cultural nature of this education. Field experience required. ***Prerequisite: ANTH F242; or permission of instructor.*** Stacked with ANS F420; ED F420. (3+0)

ED F608 **Indigenous Knowledge Systems**
3 Credits Offered Fall
A comparative survey and analysis of the epistemological properties, world views and modes of transmission associated with various indigenous knowledge systems. Emphasis on knowledge systems practiced in Alaska. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with CCS F608; RD F608; ANL F608. (3+0)

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ED F610 **Education and Cultural Processes**
3 Credits Offered as Demand Warrants
Advanced study of the function of education as a cultural process and its relation to other aspects of a cultural system. Students will be required to prepare a study in which they examine some aspect of education in a particular cultural context. Also available through the Center for Distance Education. Cross-listed with CCS F610. (3+0)

ED F611 **Culture, Cognition and Knowledge Acquisition**
3 Credits Offered Fall
An examination of the relationship between learning, thinking and perception in multicultural contexts. Particular emphasis will be on the implications of these relationships for schooling. Content will focus on cultural influences on perception, conceptual processes, learning, memory and problem solving. Content will also reflect concern for practical teaching problems. ***Recommended: ED F610.*** Cross-listed with CCS F611. (3+0)

ED F612 **Foundations of Education**
3 Credits Offered Fall
Introduces a range of philosophical thought with emphasis on schooling in the cross-cultural context and on issues of social justice and quality in education. Students will explore the interplay between cultural processes and various philosophical positions adopted by educators in the design and practice of pedagogy, learn the history of public school education in the U.S. and Alaska and analyze the policies affecting public school education today. (3+0)

ED F613 **Alaska Standards for Culturally Responsive Schools**
3 Credits Offered as Demand Warrants
Guidelines, rationale and resources for adapting educational policies, programs and practices to better address the cultural well-being of the students and communities they serve. Content will be grounded in the Alaska Standards for Culturally Responsive Schools, including standards for students, teachers, curriculum, schools and communities. Cross-listed with CCS F613. (3+0)

ED F616 **Education and Socioeconomic Change**
3 Credits Offered as Demand Warrants
An examination of social change processes, particularly in relation to the deliberate development of new institutions and resulting forms of new consciousness. Emphasis is placed on the role of education and schooling in this development dynamic. Also available through the Center for Distance Education. Cross-listed with: CCS F616 (3+0)

ED F618 **Higher Education: Basic Understanding**
3 Credits Offered as Demand Warrants
Historical and philosophical foundations of higher education, both in America and abroad. Examination of curriculum development, instruction, administration and inter-institutional cooperation, with emphasis on trends and innovations in higher education. (3+0)

ED F620 **Language, Literacy and Learning**
3 Credits Offered Fall
The relationships among language, culture and thinking as issues of literacy and learning. Specific areas of emphasis include linguistic relativity, discourse, role of context in communications, variant language learning strategies and styles, speech community, open and closed linguistic systems, cognitive styles, and literacy as a cultural and cognitive phenomenon. (3+0)

ED F621 **Cultural Aspects of Language Acquisition**
3 Credits
An expanded view of the ways in which individuals become socialized into particular patterns of first and second language and literacy. The ongoing acquisition of both oral and written language(s) from early childhood through adult life. Topics will include: the cultural dimensions of language development; the relationship between communication and culture; bilingualism; and the role of language in the transmission of sociocultural knowledge. Cross-listed with LING F621. (3+0)

ED F624 **Foundations of Education in Alaska: From Segregation to Standards**
3 Credits Offered Summer, As Demand Warrants
Review of major Alaska educational reform efforts as a means of understanding historical and current state, national and international policies and practices related to development of curriculum, pedagogy and assessment that respond to the needs and interests of culturally and linguistically diverse populations. Examination of Alaska Quality Schools Initiative reform effort with focus on use of Alaska Standards for Culturally Responsive Schools. ***Prerequisites: Admission to Internship Year or permission of instructor; a laptop computer.*** (3+0)

ED F625 **Exceptional Learners and Child Development: Individual and Cultural Characteristics**
3 Credits Offered Summer, As Demand Warrants
Foundation for understanding, identifying and teaching to developmental abilities of children and early adolescents. Human development examined in context of cognition, personality, social behavior, language and physical development with focus on understanding and using cross-cultural influences specific to Alaska. Emphasis on development of children with exceptional abilities. Design, develop and modify curriculum and instruction to developmentally and culturally appropriate approaches. Theory is applied to practice in practicum. ***Prerequisites: Admission to Internship Year or permission of instructor.*** (3+0)

ED F626 **Teaching Reading, Writing and Language Arts**
3 Credits Offered Summer, As Demand Warrants
Examination of the nature and process of reading and writing for elementary students and focus on process of developing a language arts program. Includes acquisition and role of language in this process. Examination and evaluation of materials and methods of teaching language arts, including those used in some Alaska districts. Examination and evaluation of children's literature. Practicum with application of language arts concepts. ***Prerequisites: Admission to Internship Year or permission of instructor.*** (3+0)

ED F630 **Curriculum Development**
3 Credits Offered Fall
Basic definition of curriculum. Includes the present need for curriculum improvement, criteria for selection of broad goals, types of curriculum frameworks and consideration of the organization of specific learning experiences as part of the curriculum structure. (3+0)

ED F631 **Culture, Community and the Curriculum**
3 Credits Offered Fall
Salient issues involved with the development of effective programs of instruction in small schools, including foundational design, conceptual models, organizational strategies, technical skills, current issues and trends, and their implications and application to the environment of rural Alaska. Also available through the Center for Distance Education. Cross-listed with: CCS F631 (3+0)

ED F635 **Strategies for Cooperating/Mentor Teachers**
3 Credits Offered as Demand Warrants
Study of effective teaching using alternative strategies appropriate to differing goals. Consideration will also be given to teaming with and/or supervising interns as a technique for improving instruction. Course may be repeated for credit as readings and topics change. ***Prerequisites: Licensed teacher employed in a school district.*** (3+0)

ED F636 **Improvement of Elementary Teaching**
3 Credits Offered as Demand Warrants
Emphasis on improvement of elementary teaching through professional development in which mentor teachers read, reflect and collaborate with one another and with university faculty to develop new approaches for their own professional development as well as developing and refining strategies that contribute to the preparation of student interns who can successfully demonstrate competence in the Alaska Teacher Standards and the Alaska Standards for Culturally Responsive Schools. Course may be repeated for credit as readings and topics change. (3+0)

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ED F640 **Gender and Education**
3 Credits Offered Spring Even-numbered Years
Educational practices and processes and their relation to the changing situation of women in society. Schools will be examined as sites of pervasive gender socialization and discrimination as well as offering new possibilities for liberation. Topics include the social construction of gender, patterns of access and achievement, gender as an organizing principle in schools and classrooms, and feminist agendas and strategies for change. Stacked with ED F440; WMS F440. (3+0)

ED F642 **Portfolio Preparation: Integrating Theory and Practice**
3 Credits Offered Spring
Continued systematic collection of selected work, and final preparation and presentation of required portfolios that document and provide evidence of professional development and achievement as beginning teachers relative to Alaska Teacher Standards and Alaska Student Content Standards, integrated with the Alaska Standards for Culturally Responsive Schools. Processes and products involved in portfolio preparation serve as basis for goal setting and assessment by interns, peers, mentors and university faculty. Portfolios must provide tangible evidence of the range of knowledge, dispositions and skills that the intern possesses. Technology focus: utilization of technology to prepare portfolios. Addresses Alaska Teacher Standards. ***Prerequisites: Admission to the post-baccalaureate elementary or secondary licensure program or permission of instructor.*** (2+0+3)

ED F643 **Classroom Research**
3 Credits Offered as Demand Warrants
Emphasis on providing teachers with classroom research skill and techniques for improving instruction. Includes basic educational research concepts, methods and application, and their impact on policy and practice. (1+6)

ED F645 **Small Schools Institute**
3 Credits Offered as Demand Warrants
A forum for experienced elementary and secondary rural school teachers. Discussions and seminars held with university and guest faculty, whose fields of expertise have direct applicability to small school concerns, will provide an environment for participants to share and refine different interethnic communication styles, culturally congruent teaching methodologies and curricula, and contextual understandings of the Native pupil's world. ***Prerequisites: Recent rural Alaskan small schools teaching experience.*** (2+3)

ED F649 **Elementary Art Methods**
3 Credits Offered Spring
Methodologies of instruction and assessment in art education at the elementary level. Focus is on the knowledge and tools necessary to become excellent elementary art educators. Students will be expected to construct lessons reflecting theory and practice that are developmentally appropriate for elementary level students of all ages. Particular attention will be given to using and understanding the National Standards for Art Education, Alaska Content/Performance Standards and key curriculum documents in an elementary context. ***Prerequisites: Admission to K-12 Art post-baccalaureate licensure program or M.Ed. in Curriculum and Instruction option for post-baccalaureate students.*** Stacked with ED F449. (3+0)

ED F659 **Multimedia Tools for Teachers**
3 Credits Offered Spring
Emerging technologies and software applications in education. The use of multimedia in designing teaching/learning experiences will be emphasized. Students will develop a multimedia classroom presentation and will demonstrate knowledge of Internet resources. (1+6)

ED F660 **Educational Administration in Cultural Perspective**
3 Credits Offered as Demand Warrants
Issues related to the social organization and socio-political context of schools, administrative and institutional change processes and the changing role of administrators in education, using a cross-cultural framework for analysis. Also available through the Center for Distance Education. (3+0)

ED F669 **Reading, Language and Culture**
3 Credits Offered Fall, As Demand Warrants
Introduction to the foundations of psycholinguistic and sociolinguistic theories as they relate to oral and written language acquisition and development. Focus on issues of language and literacy education practices in the Alaska context. Topics include bi-lingual and bi-literacy education, school and community languages and literacies, and culturally responsive pedagogy. Emphasis on teachers/students developing the skills and dispositions to become researchers of culture, language and literacy in their communities. (3+0)

ED F670 **Developing Reading: ECE-12**
3 Credits Offered Fall
Literacy from early childhood through grade 12. Emphasis on developmental aspects of literacy, underlying social and cognitive processes, and the pedagogical implications for teachers. Additional emphasis on the current roles of reading/literacy coaches. (3+0)

ED F671 **Reading and Cognition**
3 Credits Offered Spring
Theory and process of reading cognition, particularly the relationship between reading and thinking. Exploration of issues related to the meaning of text and the development of comprehension. Review of literature concerning research and theory about reading processes. Additional preparation for the role of the reading/literacy coach in schools, districts and communities. (3+0)

ED F672 **Literature and Reading: Supporting Readers at All Levels**
3 Credits Offered Summer
Read, analyze and design ways to use literature to support readers at all levels. Includes critical and personal response to literature, knowledge of a wide range of appropriate reading material; Includes interdisciplinary study using children's literature in varied genres. Classroom, family and community applications are emphasized. (3+0)

ED F673 **Reading and Literacy in the Content Area**
3 Credits Offered Fall
Development of knowledge of reading strategies that support literacy in the content areas/disciplines. Emphasis on interrelated processes of writing, reading, listening and speaking as they relate to content area literacy development. Exploration of the role of the reading/literacy coach in working with classroom teachers, families and communities. (3+0)

ED F678 **Mathematics Methods and Curriculum Development**
2 Credits Offered Fall
Study and application in the classroom of best practices from research-based strategies for the teaching and learning of mathematical concepts, content and methods for students in elementary classrooms with diverse populations. Requires development and classroom implementation of mathematics unit. Concurrent internship required. ***Prerequisites: Admission to the post-baccalaureate elementary licensure program; graduate standing; or permission of instructor.*** Stacked with ED F478. (2+0)

ED F680 **Comparative Education**
3 Credits Offered as Demand Warrants
Analysis of international systems of public education. Issues addressed include social context, ethnicity, gender, ideology, international power, level of development, current issues and problems, and efforts toward reform. Cross-listed with NORS F680. (3+0)

ED F681 **Place-Based Education**
3 Credits Offered Spring
An examination of the relationship between local landscape and community and the development of human perception. Emphasis on the importance of the development of ecologically appropriate community-based educational programs in rural and urban schools. Priority placed on project-centered programs lending themselves to experimental learning opportunities. Includes

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literature review, discussion, curriculum exploration and design and on-site community exploration of active place-based educational programs. (3+0)

ED F683 **Instruction and Assessment in Reading I**
3 Credits Offered Summer
Examination of standardized literacy assessments and current reading programs and how they are used in schools today. Includes norm-referenced and criterion-referenced tests as well as informal and classroom-based assessments for whole group, small group and individual students. Participants analyze and evaluate assessment and evaluation tools. The links between assessment and instruction are highlighted and their application for classroom teachers, families and the community is also addressed. ***Enrollment restriction: Student must hold a Type A teaching certificate and be admitted to the Master of Education in Reading Program, or permission of instructor.*** (3+0)

ED F684 **Instruction and Assessment in Reading II**
3 Credits Offered Fall
Teaching and assessment of reading with a focus on the reading behaviors of individual students, and effective practices associated with developing students' skills. Includes study of cognitive processes and social factors which contribute to variations in reading ability. The links between assessment and individual instructional plans are highlighted and their application for classroom teachers, families and the community are addressed. ***Enrollment restriction: Student must hold a Type A teaching certificate and be admitted to the Master of Education in Reading Program, or permission of instructor.*** (3+0)

ED F686 **Assessment and Testing in K-12 Public Schools**
3 Credits Offered Spring
Designed to provide students with a basic knowledge of assessment in K-12 public schools. Students will be required to gain a basic understanding of assessment in Alaska and to gain the confidence to interpret, analyze and discuss various, multiple and alternative assessments common in the U.S. public school system, as well as standardized tests. Issues surrounding the history of educational accountability, content standards, instructional objectives and the goals of the K-12 curriculum will be discussed. ***Prerequisites: Admittance to the M.Ed. program, or permission of instructor. Recommended: Successful completion of ED F630; ED F601; ED F612.*** (3+0)

ED F687 **Alaska: Resources, People and Perspectives**
3 Credits Offered Spring
Introduces a broad range of essential Alaska information for educators including information on history, geography, literature, economics and politics. (3+0)

ED F688 **Science Methods and Curriculum Development**
2 Credits Offered Spring
Study and application in the classroom of the best practices from research-based strategies for the teaching and learning of science concepts, content and methods for students in elementary classrooms with diverse populations. Requires development and classroom implementation of science unit. Classroom internship required. ***Prerequisites: Admission to Internship Year; concurrent enrollment in other internship year courses; Alaska passing scores for three Praxis I exams.*** Stacked with ED F479. (2+0)

ED F689 **Proseminar in Applied Educational Research**
3 Credits Offered as Demand Warrants
Application of social science and educational research methods to the description and analysis of the student's research topic. The research topic chosen will be the substance of each student's literature review and synthesizing paper. Conceptually integrated with ED F698 (to be taken a subsequent semester), where the final master's project is completed. Completion and approval of the synthesizing paper, by the committee, is required for successful completion of this course. Graded Pass/Fail. ***Prerequisites: Acceptance into an M.Ed. degree program; completion of all required core courses; at least nine credits in the area of concentration.*** (3+0)

ED F690 **Seminar in Cross-Cultural Studies**
3 Credits Offered as Demand Warrants
Investigation of current issues in cross-cultural contexts. Opportunity for students to synthesize prior graduate studies and research. Seminar is taken near the terminus of a graduate program. ***Prerequisites: Advancement to candidacy; permission of student's graduate committee.*** Cross-listed with CCS F690; ANL F690; RD F690. (3+0)

ED F691 **Contemporary Issues in Education**
3 Credits Offered as Demand Warrants
A critical overview of the current status of the field of education. Students will participate in a thorough investigation of select problems, trends and issues that presently characterize the institution of public education. Seminar sessions will focus on student research regarding the development, present impact and potential implications of each topic discussed. (3+0)

EDUCATION: SECONDARY

EDSC F205 **Introduction to Secondary Education**
3 Credits Offered Spring
Introduction to the profession of teaching in middle/high school. Incorporates historical, cultural and sociological factors, with attention to the Alaska context influencing current practice. Students will have the opportunity to explore current issues and reform facing educators today and to observe master teachers in the field. ***Prerequisites: ENGL F111X; sophomore standing; or permission of instructor.*** (3+0+2)

EDSC F402 **Methods of Teaching in the Secondary School**
3 Credits Offered Fall
Focus on methodologies appropriate for teaching middle and high school students in a variety of settings. Candidates explore the structure of schools, the nature of their audiences and will plan, implement and assess both teacher and student centered instructional strategies. Includes Alaska Content/Performance Standards. ***Prerequisites: Admission to the secondary post-baccalaureate licensure program or permission of instructor.*** (3+0)

EDSC F407 **Developing Literacy in the Content Areas**
3 Credits Offered Summer or As Demand Warrants
Preparation for secondary teachers (middle school, junior, and senior high school) to integrate listening, speaking, reading, writing and viewing strategies into a content area of the classroom. Candidates examine and evaluate learning theories related to literacy development and varied methods of instruction and assessment to help design and develop an appropriate pedagogical model for teaching. ***Prerequisites: Admission to secondary post-baccalaureate licensure program or EDSC F205 or EDSC F415 or permission of instructor.*** (3+0)

EDSC F414 **Learning, Development and Special Needs Instruction**
3 Credits Offered Summer
Survey of learning theory, adolescent development and special needs instruction. Attention will be given to the cognitive, social and moral theories of development, and to current theories of learning. Consideration will be given to cultural and individual differences among learners including those with special needs. ***Prerequisites: Admission to secondary post-baccalaureate licensure program or EDSC F205 or EDSC F415 or permission of instructor.*** Stacked with EDSC F614. (3+0)

EDSC F415 **Foundations of Modern Educational Practice**
3 Credits Offered Summer
Historical, political, sociological and curricular foundations of secondary education in the U.S. with particular attention to Alaska. For pre-service teachers to understand and reflect on the teaching profession at the secondary level and to explore current issues and controversies confronting education at national, state and local levels. ***Prerequisites: Admission to the secondary post-baccalaureate licensure program or permission of instructor.*** (3+0)

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EDSC F424 **Culturally Responsive Small School Programs for Alaska**
3 Credits Offered Spring
Exploration of effective programs in small rural schools and in urban schools using school-within-a-school and multi-age models. Emphasis on interdisciplinary models and innovative programs with multi-cultural perspectives. ***Prerequisites: Admission to the secondary post-baccalaureate licensure program or permission of instructor.*** (3+0)

EDSC F431 **Secondary Instruction and Assessment in the Content Area**
3 Credits Offered Fall
Methodologies of instruction and assessment in the candidate's specific content area. Course is taught by content specialists. Discusses current issues, methodologies and teaching strategies specific to the various disciplines. A maximum of nine credits may be earned. ***Prerequisites: Admission to the secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F631. (3+0)

EDSC F432 **English/Language Arts Secondary Instruction and Assessment**
3 Credits Offered Fall
Methodologies of instruction and assessment in English/language arts. Course is taught by content specialists. Includes discussion of current issues, methodologies and teaching strategies specific to English/language arts. ***Prerequisites: Admission to the secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F632. (3+0)

EDSC F433 **Mathematics Secondary Instruction and Assessment**
3 Credits Offered Fall
Methodologies of instruction and assessment in mathematics. Course is taught by content specialists. Includes discussion of current issues, diverse methodologies and practical application lessons for teaching mathematics. ***Prerequisites: Admission to secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F633. (3+0)

EDSC F434 **Science Secondary Instruction and Assessment**
3 Credits Offered Fall
Methodologies of instruction and assessment in science. Course is taught by content specialists. Includes discussion of current issues, diverse methodologies, inquiry-based lessons, laboratory experiences and field trips for teaching science. ***Prerequisites: Admission to secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F634. (3+0)

EDSC F435 **Social Studies Secondary Instruction and Assessment**
3 Credits Offered Fall
Methodologies of instruction and assessment in social studies. Course is taught by content specialists. Includes discussion of current issues, diverse methodologies, project-based activities and community-as-laboratory experiences for teaching social studies. ***Prerequisites: Admission to secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F635. (3+0)

EDSC F436 **Art Secondary Instruction and Assessment**
3 Credits Offered Fall
Methodologies of instruction and assessment in art. Course is taught by content specialists. Includes discussion of current issues, methodologies and teaching strategies specific to arts. ***Prerequisites: Admission to secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F636. (3+0)

EDSC F437 **World Language Secondary Instruction and Assessment**
3 Credits Offered Fall, As Demand Warrants
Methodologies of instruction and assessment in world languages. Course is taught by content specialists. Includes discussion of current issues, diverse methodologies, and current application of teaching strategies and assessment specific to world languages. ***Prerequisites: Admission to the secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F637. (3+0)

EDSC F442 **Technology Applications in Education**
3 Credits Offered Spring
Focuses on educational technology as resource for the delivery of instruction to enhance student learning. Designed for participants who will use technology tools to implement and create instructional material in a variety of media to support and assess learning, including distance educational media and methods, and to provide the tools to enhance professional productivity, collaboration and communication. Participants will create a professional electronic portfolio that demonstrates professional development and achievement relative to the ISTE National Technology Standards for Students and Teachers, Alaska Education Standards, and integrated with Standards for Culturally Responsive Schools. ***Prerequisites: Admission to the secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F642. (3+0)

EDSC F457 **Multicultural Education and School-Community Relations**
4 Credits Offered Spring
Focuses on the philosophy and theories underlying multicultural education as well as the development of positive school community relationships. Encourages pre-service educators to identify their own philosophy and culture and to recognize their cultural background as they instruct, assess and manage their students. Helps educators clarify the value of diversity in the classroom setting. Candidates discern the influence of diversity factors on students' educational careers and the value of diversity to the Alaskan community. Acquaints candidates with teaching in rural Alaska. Explores models for effective teaching, means of village socialization, cultural information and programs that are particularly effective in rural and small school settings. ***Prerequisites: Admission to secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F657. (3+0+1)

EDSC F458 **Classroom Organization and Management**
3 Credits Offered Fall
Focus on establishment of a positive learning environment, development of a successful discipline plan consistent with an educator's philosophy of education and a review of the major discipline models. Candidates will examine the role that factors such as culture, gender, interest, ability and exceptionality play in student's behavior. Techniques to maintain positive student-teacher interactions in the classroom and establish a positive relationship with parents. Developing strategies to incorporate local knowledge and community culture in to classroom practice. Field experience required. ***Prerequisites: Admission to the secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F658. (3+0)

EDSC F471 **Secondary Teaching: School Internship I and Seminar**
3 Credits Offered Fall
Supervised observation and teaching in secondary schools approved by the School of Education. Seminar topics may include special attention to school-community relations, special needs, curriculum development, teaching strategies and the integration of technology across the curriculum. The School of Education may limit enrollment, determine assignments and cancel registration of candidates doing unsatisfactory work. Graded Pass/Fail. Special fees apply. ***Prerequisites: Admission to secondary post-baccalaureate licensure program or permission of instructor.*** (1+0+25)

EDSC F472 **Secondary Teaching: School Internship II and Seminar**
3 Credits Offered Spring
Supervised observation and teaching in secondary schools approved by the School of Education. Seminar topics may include special attention to school-community relations, special needs, curriculum development, teaching strategies and the integration of technology across the curriculum. The School of Education may limit enrollment, determine assignments and cancel

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registration of candidates doing unsatisfactory work. Graded Pass/Fail. Special fees apply. ***Prerequisites: Admission to the secondary post-baccalaureate licensure program or permission of instructor.*** (1+0+35)

EDSC F614 **Learning, Development and Special Needs Instruction**
3 Credits Offered Summer
Survey of learning theory, adolescent development and special needs instruction. Attention will be given to the cognitive, social and moral theories of development, and to current theories of learning. Consideration will be given to cultural and individual differences among learners including those with special needs. ***Prerequisites: Admission to the secondary post-baccalaureate licensure program or EDSC F205 or EDSC F415 or permission of instructor.*** Stacked with EDSC F414. (3+0)

EDSC F631 **Secondary Instruction and Assessment in the Content Area**
3 Credits Offered Fall
Methodologies of instruction and assessment in the candidate's specific content area. Course is taught by content specialists. Discusses current issues, methodologies and teaching strategies specific to the various disciplines. A maximum of nine credits may be earned. ***Prerequisites: Admission to the secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F431. (3+0)

EDSC F632 **English/Language Arts Secondary Instruction and Assessment**
3 Credits Offered Fall
Methodologies of instruction and assessment in English/language arts. Course is taught by content specialists. Includes discussion of current issues, methodologies, and teaching strategies specific to English/language arts. ***Prerequisites: Admission to secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F432. (3+0)

EDSC F633 **Mathematics Secondary Instruction and Assessment**
3 Credits Offered Fall
Methodologies of instruction and assessment in mathematics. Course is taught by content specialists. Includes discussion of current issues, diverse methodologies and practical application lessons for teaching mathematics. ***Prerequisites: Admission to secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F433. (3+0)

EDSC F634 **Science Secondary Instruction and Assessment**
3 Credits Offered Fall
Methodologies of instruction and assessment in science. Course is taught by content specialists. Includes discussion of current issues, diverse methodologies, inquiry-based lessons, laboratory experiences and field trips for teaching science. ***Prerequisites: Admission to the secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F434. (3+0)

EDSC F635 **Social Studies Secondary Instruction and Assessment**
3 Credits Offered Fall
Methodologies of instruction and assessment in social studies. Course is taught by content specialists. Includes discussion of current issues, diverse methodologies, project-based activities and community associated laboratory experiences for teaching social studies. ***Prerequisites: Admission to secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F435. (3+0)

EDSC F636 **Art Secondary Instruction and Assessment**
3 Credits Offered Fall
Methodologies of instruction and assessment in art. Course is taught by content specialists. Includes discussion of current issues, methodologies and teaching strategies specific to arts. ***Prerequisites: Admission to secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F436. (3+0)

EDSC F637 **World Language Secondary Instruction and Assessment**
3 Credits Offered as Demand Warrants
Methodologies of instruction and assessment in world languages. Course is taught by content specialists. Includes discussion of current issues, diverse methodologies and current application of teaching strategies and assessment specific to world languages. ***Prerequisites: Admission to secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F437. (3+0)

EDSC F642 **Technology Applications in Education**
3 Credits Offered Spring
Focuses on educational technology as resource for the delivery of instruction to enhance student learning. Designed for participants who will use technology tools to implement and create instructional material in a variety of media to support and assess learning, including distance educational media and methods, and to provide the tools to enhance professional productivity, collaboration and communication. Participants will create a professional electronic portfolio that demonstrates professional development and achievement relative to the ISTE National Technology Standards for Students and Teachers, Alaska Education Standards, and integrated with Standards for Culturally Responsive Schools. ***Prerequisites: Admission to the secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F442. (3+0)

EDSC F657 **Multicultural Education and School-Community Relations**
4 Credits Offered Spring
Focuses on the philosophy and theories underlying multicultural education as well as the development of positive school community relationships. Encourages pre-service educators to identify their own philosophy and culture and to recognize their cultural background as they instruct, assess, and manage their students. Helps educators clarify the value of diversity in the classroom setting. Candidates discern the influence of diversity factors on students' educational careers and the value of diversity to the Alaskan community. Acquaints candidates with teaching in rural Alaska. Explore models for effective teaching, means of village socialization, cultural information and programs that are particularly effective in rural and small school settings. ***Prerequisites: Admitted to the secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F457. (3+0+1)

EDSC F658 **Classroom Organization and Management**
3 Credits Offered Fall
Focus on establishment of a positive learning environment, development of a successful discipline plan consistent with an educator's philosophy of education and a review of the major discipline models. Candidates will examine the role that factors such as culture, gender, interest, ability and exceptionality play in student's behavior. Candidates will study techniques to maintain positive student-teacher interactions in the classroom and establish a positive relationship with parents. Developing strategies to incorporate local knowledge and community culture into classroom practice. Field experience required. ***Prerequisites: Admission to the secondary post-baccalaureate licensure program or permission of instructor.*** Stacked with EDSC F458. (3+0)

EDUCATION: SPECIAL EDUCATION

EDSE F422 **Curriculum and Strategies II: High Incidence**
3 Credits
Methods of instruction and strategies for addressing the needs of students with mild learning and behavior problems. A theoretical basis for selecting approaches is presented along with practical strategies that can be used in the classroom. Field experience required. ***Prerequisites: ED F201; EDSE F482.*** Cross-listed with EDSE F622. (3+0)

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EDSE F482 Inclusive Classrooms for All Children
3 Credits
An in-depth understanding of concepts, strategies and issues that surround supporting the needs of students who experience disabilities in the general education classroom. Field experience required. ***Prerequisites: ED F201. Note: Elementary Education students are required to submit Praxis I scores to School of Education prior to enrolling in EDSE F482.*** (3+0)

EDSE F605 Early Childhood Special Education
3 Credits Offered Fall; As Demand Warrants
Survey of philosophical, legal, and programmatic foundations of early childhood special education; characteristics of young children with disabilities; strategies to support young children with disabilities in inclusive settings; development, implementation, and evaluation of Individual Family Services Program (IFSP) plans in culturally diverse settings. Field experience required. (3+0)

EDSE F610 Assessment of Students with Disabilities
3 Credits Offered Summer; As Demand Warrants
Techniques and methods used for assessing students with disabilities. Focuses on the purpose of assessment, testing terminology and statistics, and administration and interpretation of formal and informal assessment procedures. Address assessment issues in all Alaskan communities. Field experience required. (3+0)

EDSE F612 Curriculum and Strategies I: Low Incidence
3 Credits Offered Summer; As Demand Warrants
Development, implementation and evaluation of Individual Education Program (IEP) plans for students with intensive needs. Provides in-depth understanding of best practice strategies for supporting students with low incidence disabilities in all Alaska communities. Field experience required. (3+0)

EDSE F622 Curriculum and Strategies II: High Incidence
3 Credits Offered Fall; As Demand Warrants
Development, implementation support and evaluation of Individual Education Program (IEP) plans for students with high incidence disabilities such as attention/deficit hyperactivity disorder, specific learning disabilities, emotional and behavioral disorders, and communication disorders. Provides in-depth understanding of best practice strategies for supporting students with high incidence disabilities. Field experience required. Cross-listed with EDSE F422. (3+0)

EDSE F624 Social/Emotional Development, Assessment, and Intervention
3 Credits Offered Fall; As Demand Warrants
Review current research in both normal and abnormal social/emotional development. Emphasizes the use of research-based practices in assessment and intervention. Explores academic and cultural diversity in the social/emotional growth of students with learning differences. Field experience required. (3+0)

EDSE F625 Teaching Mathematics to Special Learners
3 Credits Offered Fall; As Demand Warrants
Provides assessment and instructional strategies in mathematics for teachers of students with disabilities. Focuses on standards-based instruction, explicit instruction, curriculum-based assessments and preparation of students for high stakes testing. Field experience required. (3+0)

EDSE F632 Special Education Law: Principles and Practices
3 Credits Offered Fall; As Demand Warrants
Examines three federal laws that form the foundation of disability law: Individuals with Disabilities Education Act (IDEA) 2004; Section 504 of the Rehabilitation Act of 1973; and the Americans with Disabilities Act. Focuses on substantive principles that underlie procedural requirements including due process issues, case law analysis, policy changes and the creation of a legally defensible Individual Educational Program (IEP). (3+0)

EDSE F633 Autism: Communication and Social Disorders
3 Credits Offered Spring; As Demand Warrants
Current methods for assessment and intervention of students with autism. Current issues and trends affecting educational practices are analyzed. Case study method used to make assessment and instructional decisions. Parent communication is emphasized. Field experience required. (3+0)

EDSE F640 Collaboration and Consultative Methods
3 Credits Offered Spring; As Demand Warrants
How to coordinate with regular education teachers, paraprofessionals, speech language therapists, Alaska Native Education Liaisons, coaches, principals, counselors and outside agencies. ***Prerequisites: Admission to the Master in Education in Special Education Program or the Special Education Certification Program or permission of instructor.*** (3+0)

EDSE F642 Autism and Asperger Syndrome: Social and Behavioral Issues
3 Credits Offered Spring; As Demand Warrants
Review functional behavioral assessments, development of behavior plans, use of social stories, social skills and life skills instruction to assist inclusive practices of students with autism or Asperger Syndrome. Field experience required. ***Prerequisites: Admission to the Master in Education in Special Education Program or the Special Education Certification Program or permission of instructor.*** (3+0)

EDSE F677 Reading Assessment, Curriculum and Strategies
3 Credits Offered Spring; As Demand Warrants
Use and interpretation of reading assessments. The development of effective, research-based instructional strategies for students with disabilities who experience difficulties reading in any Alaska community. Field experience required. ***Admission to the Master in Education in Special Education Program or the Special Education Certification Program or permission of instructor.*** (3+0)

EDSE F680 Special Education Practicum
3 Credits Offered Fall; As Demand Warrants
Field experience with individuals who have disabilities in public schools and affiliated facilities. Assignments vary across areas of teaching specialization. Includes weekly seminar. Must be taken concurrently with EDSE F696. Field experience required. Special fee. ***Prerequisites: Minimum of 24 graduate credits in special education (may include the following UAF courses EDSE: F605, F610, F612, F622, F624, F625, F632, F633, F640, F642, F677) taken concurrently with EDSE F696; Admission to the Master in Education in Special Education Program or the Special Education Certification Program; or permission of instructor.*** (3+0)

EDSE F681 Special Education Portfolio
3 Credits Offered Fall; As Demand Warrants
Development of special education portfolio based on UAF School of Education conceptual framework, Council for Exceptional Children (CEC) Special Education Standards, Alaska Teacher Standards, and Assembly of Alaska Native Educator (AANE) Guidelines for Preparing Culturally Responsive Teachers for Alaska's Schools. Must be taken concurrently with EDSE F694. ***Prerequisites: Minimum of 24 graduate credits in special education (may include the following UAF courses EDSE: F605, F610, F612, F622, F624, F625, F632, F633, F640, F642, F677) taken concurrently with EDSE F694; Admission to the Master in Education in Special Education Program or the Special Education Certification Program or permission of instructor.*** (3+0)

EDUCATOR: PARA-PROFESSIONAL

EDPA F110 Introduction to Para-Professional Education
2 Credits Offered as Demand Warrants
The roles and responsibilities of the para-professional educator, including requirements of confidentiality, school policies and procedures, and rights and responsibilities, of parents students and school staff. ***Recommended: ABUS F170; DEVS F104; ENGL F111X or above.*** (2+0)

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EDPA F120 **Classroom Management**
2 Credits Offered as Demand Warrants
Comprehensive course to observe and document a variety of strategies for effective classroom organization, management and communication. Students will discuss and reflect upon the relationship between classroom management and student learning and learn strategies for establishing a positive classroom environment. ***Recommended: ABUS F170; DEVS F104; ENGL F111X or above.*** (2+0)

EDPA F130 **Differentiating Instruction**
2 Credits Offered as Demand Warrants
Different modalities of learning and teaching strategies necessary for meeting individual learners' needs. Course may be repeated once for credit. ***Recommended: ABUS F170; DEVS F104; ENGL F111X or above.*** (2+0)

EDPA F140 **Developing Children as Writers**
1 Credit Offered as Demand Warrants
How to assist teachers in assessing student writing skills and developing children as writers. Para-professionals will become skilled in linking writing to the culture and environment of the child. Course may be repeated twice for credit. Graded Pass/Fail. ***Recommended: ABUS F170; DEVS F104; ENGL F111X or above.*** (1+0)

EDPA F150 **Developing Children as Readers**
1 Credit Offered as Demand Warrants
Developing skills necessary for assisting teachers in using best practices in teaching reading in the elementary classroom. Para-professionals will become skilled in linking reading to the culture and environment of the child. Course may be repeated twice for credit. Graded Pass/Fail. (1+0)

EDPA F160 **Primary Math Methods**
1 Credit Offered as Demand Warrants
Developing the skills necessary for assisting teachers in using best practices in teaching math in the primary classroom. Para-professionals will become skilled in linking mathematics to the culture and environment of the child. Course may be repeated twice for credit. (1+0)

EDPA F170 **Upper Elementary Math Methods**
1 Credit Offered as Demand Warrants
Developing the skills necessary for assisting teachers in using best practices in teaching math in the elementary classroom. Para-professionals will become skilled in linking mathematics to the culture and environment of the child. Course may be repeated three times for credit. Graded Pass/Fail. (1+0)

EDPA F190 **Integrating Local Knowledge into the Curriculum**
1 Credit Offered as Demand Warrants
Learn the prehistory, history and culture of the students' communities and regions, and strategies for integrating this knowledge into the school curriculum. Course may be repeated three times for credit. Graded Pass/Fail. (1+0)

EDPA F199 **Practicum I**
1 Credit Offered as Demand Warrants
Individualized work experience. The student will work as a para-professional in the classroom with a teacher or para-professional over a sustained period of at least three weeks. Course may be repeated once for credit. Graded Pass/Fail. ***Recommended: EDPA F110.*** (1+0)

EDPA F210 **Technology in the Classroom**
1 Credit Offered as Demand Warrants
Comprehensive introduction to various ways that technology can be utilized in the classroom. Students will be exposed to practical computer use such as exploring software, electronic grade books, lesson plans, graphics, digital photography, internet use and Internet safety. Course may be repeated once for credit. ***Prerequisites: CIOS F100.*** (0.5+1)

EDPA F250 **Current Topics for Educators**
1 Credit Offered as Demand Warrants
Focus on in-service training offered through school districts to update and train para-professionals and teachers on the use of district curriculum, policies, procedures, etc. Course may be repeated three times for credit. Graded Pass/Fail. (1+0)

EDPA F299 **Practicum II**
1 Credit Offered as Demand Warrants
Individualized work experience. The student will work as a para-professional in the classroom with a teacher or a para-professional over a sustained period of at least three weeks. Course may be repeated once for credit. Graded Pass/Fail. ***Recommended: EDPA F110.*** (1+0)

ELECTRICAL ENGINEERING

EE F102 **Introduction to Electrical and Computer Engineering**
3 Credits Offered Spring
Basic modern devices, concepts, technical skills and instruments of electrical engineering. Special fees apply. ***Co-requisites: MATH F200X.*** (2+3)

EE F203 **Electrical Engineering Fundamentals I**
4 Credits Offered Fall
Analysis of alternating-current circuits using complex notation and phasor diagrams, resonance, transformers and three-phase circuits. Introduction to network and system analysis. Special fees apply. ***Prerequisites: MATH F200X; EE F102. Co-requisite: MATH F201X.*** (3+3)

EE F204 **Electrical Engineering Fundamentals II**
4 Credits Offered Spring
Electronics of solid state devices, amplifier design, digital circuits, electromechanics, control systems and instrumentation. Special fees apply. ***Prerequisites: EE F203; MATH F201X. Co-requisite: MATH F202X.*** (3+3)

EE F303 **Electrical Machinery**
4 Credits Offered Fall
Electromechanical energy conversion principles, characteristics and applications of transformers, synchronous and induction machines, DC machines, and special machines. Special fees apply. ***Prerequisites: EE F204.*** (3+3)

EE F311 **Applied Engineering Electromagnetics**
3 Credits Offered Fall
Analysis and design of transmission lines and distributed linear circuits using impedance concepts. Development of electromagnetic field equations and their relation to circuit models. Magnetostatics and the magnetic circuit. Electromagnetic wave propagation. Application of the wave equation to engineering systems. ***Prerequisites: EE F204; MATH F202X; PHYS F212X. Co-requisite: MATH F302.*** (3+0)

EE F331 **High Frequency Lab**
1 Credit Offered Fall
Laboratory experiments in transmission lines, impedances, bridges, scattering parameters, hybrids and waveguides. Special fees apply. ***Co-requisites: EE F311.*** (0+3)

EE F333 W **Physical Electronics**
4 Credits Offered Fall
Basic properties of semiconductors. Principles of semiconductor devices, diodes, transistors and integrated circuits. Special fees apply. ***Prerequisites: EE F204; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** (3+3)

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EE F334 **Electronic Circuit Design**
4 Credits Offered Spring
Application of semiconductor devices in circuit design in computation, automatic control and communication. Special fees apply. ***Prerequisites: EE F333.*** (3+3)

EE F341 **Digital and Computer Analysis and Design**
4 Credits Offered Fall
Modular structure of computer systems. Analysis, design and implementation of combinational and sequential logic machines. Introduction to microprocessor architecture and microprocessor programming. Design with traditional and hardware description language techniques. Special fees apply. ***Prerequisites: CS F201; one year of college physics.*** (3+3)

EE F343 **Digital Systems Analysis and Design**
4 Credits Offered Fall
Fundamental principles and practices of digital design. Analysis, design and implementation of combinational and sequential logic machines. Introduction to microprocessor architecture and microprocessor programming. Analysis of digital data transmission techniques and microprocessor interfacing. Design with traditional and hardware description language techniques. Implementation with both medium and large scale integrated (M/LSI) chips and programmable logic devices (PLDs). Special fees apply. ***Prerequisites: ES F201 or CS F201; EE F204; EE F333. Note: EE F333 may be taken concurrently.*** (3+3)

EE F353 **Circuit Theory**
3 Credits Offered Fall
Analysis by Laplace transform, state variable, and Fourier methods, convolution, frequency selective networks, and two-port circuits. ***Prerequisites: EE F204; ES F201 or CS F201; MATH F202X. Co-requisite: MATH F302.*** (3+0)

EE F354 **Engineering Signal Analysis**
3 Credits Offered Spring
Analog signals and Fourier transformations. Discrete time signals and FFT. Probability theory and random variables. Random signals and noise. ***Prerequisites: EE F353; MATH F302.*** (3+0)

EE F404 **Electrical Power Systems**
4 Credits Offered Spring
Electrical power transmission and distribution systems, power flow, symmetrical faults, and economic dispatch with computer-aided analysis. Special fees apply. ***Prerequisites: EE F303.*** (3+3)

EE F406 **Electrical Power Engineering**
4 Credits Offered Fall
Economic operation of power systems, symmetrical and unsymmetrical faults, power system protection, dynamic power system stability, and computer-aided fault and transient stability analysis. Special fees apply. ***Prerequisites: EE F404 or equivalent.*** (3+3)

EE F408 **Power Electronics**
3 Credits Offered Spring
Study of past and current technology used in power conversion and control equipment. Topics will include the theory and application of thyristors, rectifiers, DC-DC convertors, inverters, resonant converters, AC and DC switches and regulators, power supplies, DC drives and adjustable-speed drives, including variable-frequency drives and cycloconverters. ***Prerequisites: EE F303; EE F333; or permission of instructor.*** Stacked with EE F608. (3+0)

EE F412 **Electromagnetic Waves and Devices**
3 Credits
Solution of Maxwell's equations for the interaction of electromagnetic waves with conducting and dielectric media. Theory and design of antennas and waveguides. ***Prerequisites: EE F311; EE F331; MATH F302.*** (3+0)

EE F432 **Electromagnetics Laboratory**
1 Credit
Laboratory experiments with microwave sources, propagating electromagnetic waves, waveguides and antennas. Design, construction and testing of antenna systems. ***Co-requisites: EE F412.*** (0+3)

EE F434 W,O **Instrumentation Systems**
4 Credits Offered Spring
Analysis and design of instrumentation systems. Static and dynamic characteristics; accuracy, noise and reliability; sensors; signal conditioning; typical measurement systems and microprocessor applications. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; EE F334; EE F343; EE F354; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; senior standing.*** (3+3)

EE F443 **Computer Engineering Analysis and Design**
4 Credits Offered Spring
Advanced digital design, and principles and practices of computer engineering. Analysis and design of computer architecture and organization. Digital signal processing techniques and hardware. Microprocessor operation, control and interfacing. Design with traditional and hardware description language techniques. Implementation with both medium and large scale integrated (M/LSI) chips and programmable logic devices (PLDs). Special fees apply. ***Prerequisites: EE F341 or EE F343.*** (3+3)

EE F444 W,O **Embedded Systems Design**
4 Credits Offered Fall
Issues surrounding the design and implementation of microcontroller-based embedded systems. Topics include hardware architecture and glue logic, embedded programs design, analysis, and optimization, hardware/firmware partitioning, firmware architecture and design. Includes laboratory exercises using evaluation board and a complete embedded system design project. Emphasis on robust designs, energy efficiency, and proper documentation. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; EE F343 or EE F341; EE F443 or permission of instructor; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; senior standing. Recommended: CS F301.*** Stacked with EE F645. (3+3)

EE F451 **Digital Signal Processing**
4 Credits Offered Fall
Time, frequency and Z-transformation domain analysis of discrete time systems and signals; discrete Fourier transformation (DFT) and FFT implementations; FIR/IIR filter design and implementation techniques; discrete time random signals and noise analysis; quantization and round off errors; and spectral analysis. Includes applications to medical, speech, electromagnetic and acoustic signal analysis. Special fees apply. ***Prerequisites: EE F354 or equivalent.*** Stacked with EE F651. (3+3)

EE F461 **Communication Systems**
4 Credits Offered Fall
Theory, design and implementation of communication systems. Measurement of modulation, noise, channel spectrum, satellite link budget and microwave path design. Special fees apply. ***Prerequisites: EE F354; senior standing.*** (3+3)

EE F463 **Communication Networks**
3 Credits Offered Spring
Design of voice and data networks. Traffic measurement, network topology, circuit sizing and network performance measures. Tariffs and economic considerations. Cost-performance relationships. Cannot take both EE F463 and EE F464 for credit. ***Prerequisites: Senior standing.*** (3+0)

EE F464 W,O **Communication Networks Design**
4 Credits Offered Spring
Design of voice and data networks. Traffic measurement, network topology, circuit sizing and network performance measures. Tariffs and economic considerations. Cost-performance relationships. Cannot take both EE F464 and EE F463 for credit. Special fees apply. ***Prerequisites: COMM F131X or COMM***

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F141X; EE F354; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; senior standing. (3+3)

EE F471 Fundamentals of Automatic Control
3 Credits Offered Spring
Linear system representation by transfer functions, signal flow graphics and state equations. Feedback, time and frequency response of linear systems. Identification, controllability and observability. Stability analysis by Routh-Hurwitz criterion and frequency domain methods. Specifications of higher order linear systems. System design and compensation. ***Prerequisites: EE F353; MATH F302.*** (3+0)

EE F488 Undergraduate Research
1-3 Credits
Advanced research topics from outside the usual undergraduate requirements. ***Prerequisites: Permission of instructor. Recommended: A substantial level of technical/scientific background.*** (0+0)

EE F603 Advanced Electric Power Engineering
3 Credits Offered Fall Even-numbered Years
Selected advanced topics in electric power generation, transmission, use, optimization, stability and economics. ***Prerequisites: EE F404 or permission of instructor.*** (3+0)

EE F604 Electric Power Systems Transients
3 Credits Offered Fall Even-numbered Years
Power system transient analysis, use of the electromagnetic transients program (EMTP), insulation coordination, transient recovery voltage phenomena and resonance conditions. ***Prerequisites: EE F406 or permission of instructor.*** (3+0)

EE F605 Power System Stability and Control
3 Credits Offered Spring Odd-numbered Years
Advanced power system stability analysis, including generator steady state and dynamic models, voltage and power control equipment, load models, network constraints, numerical methods, supplemental control via power system stabilizers and static var systems, and software tools. ***Prerequisites: EE F406 or permission of instructor.*** (3+0)

EE F606 Electric Power System Protection
3 Credits Offered Spring Odd-numbered Years
Principles and applications of electric power systems protective relaying. Topics include fault analysis, relay types, instrumentation transformers, protection schemes, grounding, stability and computer aided design. ***Prerequisites: EE F404; EE F406; or permission of instructor.*** (3+0)

EE F608 Power Electronics
3 Credits Offered Spring
Study of past and current technology used in power conversion and control equipment. Topics will include the theory and application of thyristors, rectifiers, DC-DC converters, inverters, resonant converters, AC and DC switches and regulators, power supplies, DC drives and adjustable-speed drives, including variable-frequency drives and cycloconverters. ***Prerequisites: EE F303; EE F333; graduate standing; or permission of instructor.*** Stacked with EE F408. (3+0)

EE F610 Linear Systems
3 Credits Offered Fall Even-numbered Years
Methods of representation and analysis for discrete and continuous time. Topics include deterministic, random, continuous and discrete inputs, two-sided Laplace and Z-transforms, discrete and fast Fourier transformers, and state variable theory. ***Prerequisites: EE F354; MATH F302; or permission of instructor.*** (3+0)

EE F611 Waves
3 Credits Offered Spring Odd-numbered Years
Introduction to waves and wave phenomena. Includes electromagnetic, acoustic, seismic, atmospheric and water waves and their mathematical and physical treatment in terms of Hamilton's principle. Discusses propagation, attenuation, reflection, refraction, surface and laminal guiding, dispersion, energy density, power flow, and phase and group velocities. Treatment limited to plane harmonic waves in isotropic media. ***Prerequisites: MATH F302 or MATH F421 or permission of instructor.*** (3+0)

EE F632 Quantum Electronics
3 Credits
Application of quantum mechanical concepts to problems in optical electronics. Study of principles and practices in design and operation of semiconductor devices, lasers and optical propagation systems. Survey of applications in science and engineering. ***Prerequisites: EE F332; EE F333; MATH F302; or permission of instructor.*** (3+0)

EE F634 Microwave Design I
3 Credits Offered Fall Odd-numbered Years
Analysis, design, fabrication and measurement of passive microwave components and circuits using microstrip construction techniques. Theoretical and computer-aided design of transmission lines, power dividers, hybrids, directional couplers and filters. Special fees apply. ***Prerequisites: EE F334; EE F412; EE F432; or permission of instructor.*** (2+3)

EE F635 Microwave Design II
3 Credits Offered Spring Even-numbered Years
Analysis and design of solid-state microwave circuits. Amplifier and oscillator circuits are designed and fabricated using microstrip construction techniques and computer-aided design tools. Special fees apply. ***Prerequisites: EE F634 or permission of instructor.*** (2+3)

EE F645 Embedded Systems Design
4 Credits Offered Fall
Focus on issues surrounding the design and implementation of microcontroller-based embedded systems. Topics include hardware architecture and glue logic, embedded programs design, analysis, and optimization, hardware/firmware partitioning, firmware architecture and firmware design. Includes laboratory exercises using evaluation board and a complete embedded system design project. Emphasis on robust designs, energy efficiency, and proper documentation. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with EE F444. (3+3)

EE F651 Digital Signal Processing
4 Credits Offered Fall
Time, frequency and Z-transformation domain analysis of discrete time systems and signals; discrete Fourier transformation (DFT) and FFT implementations; FIR/IIR filter design and implementation techniques; discrete time random signals and noise analysis; quantization and round off errors; and spectral analysis. Includes applications to medical, speech, electromagnetic and acoustic signal analysis. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with EE F451. (3+3)

EE F652 Adaptive Systems and Neural Networks
3 Credits Offered Fall Even-numbered Years
Self-optimizing systems whose performance is improved through contact with their environments. Feedback models for least mean square error adaptation processes. Multiple-layer adaptive neural networks. Competitive learning back propagation, self organization, associative memory. ***Prerequisites: EE F451 or equivalent.*** (3+0)

EE F653 Random Signals and Systems
3 Credits Offered Fall Even-numbered Years
Study of random variables and processes as signals, their interaction with linear and nonlinear systems, their estimation and properties of their estimators, and the detection of such processes in noisy environments. Review of probability and characterization of random processes, linear and nonlinear systems with random excitations, optimum estimation theory, spectral representation and estimation, and detection theory. ***Prerequisites: EE F354; MATH F371; or permission of instructor.*** (3+0)

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EE F655 **Adaptive Filters**
3 Credits Offered Spring Even-numbered Years
Study to self-designing filters which recursively update depending on the statistics of the input data for optimum performance. Topics will include foundational material in probability of stochastic processes, spectral analysis, linear optimum filtering. Wiener-Hopf filters, Yule-Walker equations, forward and backward linear predictors, method of steepest descent, least squares techniques, and auto- regressive filters. ***Prerequisites: EE F451 or permission of instructor.*** (3+0)

EE F656 **Space Systems Engineering**
3 Credits Offered Spring Odd-numbered Years
A multidisciplinary team of students will perform a preliminary design study of a major space system. Design considerations will include requirements for project management, spacecraft design, power, attitude control, thermal control, communications, computer control and data handling. The students will present their final design in a written report and a public seminar. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with ME F656. (3+0)

EE F662 **Digital Communication Theory**
3 Credits Offered Fall Even-numbered Years
Probability in communication systems, power spectral density, baseband formatting, bandpass modulation and demodulation, link analysis, coding and channel models. Sections of this course offered in Anchorage have an additional fee. ***Prerequisites: EE F461 or permission of instructor.*** (3+0)

EE F665 **Antennas**
3 Credits Offered Spring Odd-numbered Years
Fundamental principles of antenna theory. Application to the analysis, design and measurement of many different antenna structures. ***Prerequisites: EE F412; EE F461; or permission of instructor.*** (3+0)

EE F667 **Satellite Communications**
3 Credits Offered Fall Odd-numbered Years
Satellite orbital parameters, satellite hardware, link budgets, modulations and multiple access techniques, operational considerations, operating and proposed satellite communication systems. ***Prerequisites: EE F461; graduate standing; or permission of instructor.*** (3+0)

EE F669 **Radiowave Propagation**
3 Credits Offered Spring Even-numbered Years
A study of the effects of the earth, atmosphere, ionosphere and atmospheric hydrometeors such as raindrops, snow and hail on the propagation of radiowaves. Satellite to earth propagation effects will be emphasized. ***Prerequisites: EE F461; graduate standing; or permission of instructor.*** (3+0)

EE F671 **Digital Control Systems**
3 Credits Offered as Demand Warrants
Study of digital control theory. Topics will include signal conversion, Z-transforms, state variable techniques, stability, time and frequency domain analysis and system design. ***Prerequisites: EE F471 or permission of instructor.*** (3+0)

EE F673 **Modern Control Engineering**
3 Credits Offered Fall Even-numbered Years; As Demand Warrants
Introduction to state space systems in the study of dynamical systems; brief review of modeling and basic concepts of classical control theory and matric algebra; stability analysis of feedback systems; design of output and state feedback control systems; controllability and observability of dynamical systems; state feedback; state observers; robust control; optimal control. Analysis and design using MATLAB and SIMULINK; demonstrations on PUMA 560 and Hardware-in-the-Loop simulator test-beds. ***Prerequisites: EE F471 or equivalent; permission of instructor.*** (3+0)

ELECTRONICS TECHNOLOGY

ELT F101 **Basic Electronics: DC Physics**
4 Credits Offered as Demand Warrants
Basic terms and units. Use of test equipment, hand tools and techniques of soldering. Ohm's law, fundamentals of magnetism, DC circuit analysis, inductance and capacitance in DC circuits. Special fees apply. Special fees apply. ***Prerequisites: Placement in DEVM F050 or TTCH F131 or permission of instructor.*** (4+0)

ELT F102 **Basic Electronics: AC Physics**
4 Credits Offered as Demand Warrants
Principles of alternating current, vectors, phase relationships, inductive and capacitive reactance and impedance. AC circuit analysis, series and parallel resonant circuits, transformers and network analysis. Special fees apply. ***Prerequisites: ELT F101, DEVM F105 which can be taken concurrently with this class, or permission of instructor.*** (4+0)

ELT F111 **Amateur Radio Licensing**
1-3 Credits Offered as Demand Warrants
Overview of amateur radio. Code and radio theory provided for the Novice and General Amateur License Examination. Community emergency communications, net operations, repeaters, and public classroom applications for those already licensed. (1-3+0)

ELT F171 **National Electric Code Study**
3 Credits Offered as Demand Warrants
Systematic study of the National Electric Code and rules governing minimum requirements for installation of electrical services, feeders and branch circuits, and requirements for construction and installation of electrical equipment. ***Prerequisites: ELT F102 or permission of instructor. Recommended: DEVM F105 or PRT F155.*** (3+0)

ELT F246 **Electronic Industrial Instrumentation**
3 Credits Offered as Demand Warrants
Methods of analog electronic signal transmission. Discussion of the details of several pieces of equipment in-depth, providing practice in establishing correct interconnections. Basic concepts used in troubleshooting this type of equipment are also introduced. ***Prerequisites: ELT F102 or permission of instructor. Recommended: DEVM F105 or PRT F155.*** (3+0)

EMERGENCY MEDICAL SERVICES

EMS F150 **Wilderness Emergency Care**
3 Credits As Demand Warrants
Introduction to medicine in a remote setting. Assessment and management of life-threatening and non-threatening injuries, common medical emergencies and a variety of environmental injuries. Academically challenging training includes basic anatomy and physiology, appropriate short-term to mutli-day patient care, the incident command system and evacuation and considerations. (20+0)

EMS F152 **Emergency Trauma Training First Responder**
3 Credits
Basic emergency care knowledge and skills for the student who will provide the first emergency care. The objective of the first person on the emergency scene is to recognize the needs of the victim and deliver quality care to the patient, minimizing discomfort and preventing further complications. (2+2)

EMS F154 **Emergency Trauma Training Refresher**
1 Credit Offered Fall
For individuals who have been previously certified in Emergency Trauma Training (40 hrs.). Certification is valid for two years. ***Prerequisites: EMS F152 or ETT Certification which may not be expired more than one calendar year.*** (1+0)

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EMS F160 **Basic Trauma Life Support**
1 Credit Offered as Demand Warrants
Provides the first line of life support to the trauma patient as encountered in situ and to maintain life until the patient is handed off to the next level of medical help. Graded Pass/Fail. (1+0)

EMS F168 **ETT to EMT Bridge Course**
3 Credits Offered as Demand Warrants
Allows certified emergency trauma technician (ETT) to progress to the emergency medical technician in an efficient manner. Credits the ETT with the knowledge and skills learned in primary training. ***Prerequisites: Current Emergency Trauma Technician certificate.*** (0.5+5)

EMS F170 **EMT: Emergency Medical Technician I**
6 Credits Offered as Demand Warrants
Basic life support such as splinting, hemorrhage control, oxygen therapy, suction, CPR and use of automated external defibrillators (AEDs). EMT I is the foundation of all emergency medical training. Mastering of EMT I level knowledge and techniques must occur before moving on to advanced levels. Cross-listed with ARSK F170. (4+4)

EMS F172 **EMT: Emergency Medical Technician I Refresher**
1 Credit Offered Fall
Review of basic skills and emergency medical procedures at the Basic EMT I level. Covers emergency medical care procedural changes, newly developed equipment and its use, changes in state licensure or other medical-legal requirements. Also Offered Pass/Fail as EMS F172P. ***Prerequisites: EMT I certification.*** (0.5+1)

EMS F173 **EMT I Internship**
6 Credits Offered Spring
Synthesize cognitive and psychomotor skills from the EMT I course and observe skills performed by Advanced Care Providers. Designed for individuals planning to participate in the TVC paramedic program in the fall semester. Interns will perform all aspects of emergency care for an Alaska certified EMT I under the guidance of an Advanced Care Provider. Graded Pass/Fail. ***Prerequisites: EMS F170; concurrent EMT I certification; permission of instructor.*** (0+16)

EMS F176 **Aeromedical Evacuations in Alaska**
1 Credit Offered Fall
History of Alaska aeromedical transport; physiological aspects of pressure and atmosphere; physical effects of flight on the patient and escort; aircraft and equipment considerations; legal aspects of air transport; effects of aeromedical transport on specific medical situations. Graded Pass/Fail. Special fees apply. ***Prerequisites: EMT I certification or permission of instructor.*** (1+0)

EMS F181 **Clinical Rotation I**
4 Credits Offered Fall, As Demand Warrants
Perform paramedic skills in the hospital setting under the guidance of a clinical preceptor. Rotations include the emergency department, ICU, operating room, respiratory therapy, and mental health units. Provides an in-depth look at the respiratory, circulatory and nervous systems. Includes interpretation of cardiac rhythms and advanced cardiac life support. Special fees apply. ***Prerequisites: Permission of program coordinator. Note: Student must have the strength to be able to move patients, sufficient vision to assess the condition of the patient and the dexterity to perform the skills of a paramedic.*** (0+4+4)

EMS F183 **Clinical Rotation II**
4 Credits Offered Spring, As Demand Warrants
Perform paramedic skills in the hospital setting under the guidance of a clinical preceptor. Rotations include the emergency department, ICU, OR, labor and delivery, pediatrics and geriatrics. ***Prerequisites: EMS F181. Note: Student must have the strength to be able to move patients, sufficient vision to assess the condition of the patient and the dexterity to perform the skills of a paramedic.*** (0+4+4)

EMS F251 **Basic Life Support Instructor**
1 Credit Offered as Demand Warrants
The American Heart Association Basic Life Support instructor's course provides the knowledge and skills necessary to instruct and evaluate potential BLS providers. Balances what information to teach with how to teach BLS. The BLS instructor student will be monitored during the first class she/he teaches by the BLS instructor trainer. Graded Pass/Fail. Special fees apply. ***Prerequisites: Basic Life Support certified; permission of program coordinator.*** (1+0)

EMS F253 **Alaska EMT Instructor Orientation**
3 Credits Offered as Demand Warrants
Adult education and learning environment, as well as regulations governing the teaching of EMTs in the state of Alaska. This course is designed to be an intensive learning experience with extensive out-of-class preparation. Proficiency with EMT skills and knowledge prior to entering this training program is expected as there will be no review of EMT skills or knowledge during this class. Graded Pass/Fail. ***Prerequisites: Current EMT I, II, III or MICP certification and three years of experience; evidence of successful completion of state of Alaska practical exam and written exam with a score of 90% within the last 12 months. Recommended: FIRE F216.*** (3+0)

EMS F257 **Arctic Survival**
3 Credits Offered Spring
Principles, procedures, techniques and equipment necessary to survive extreme arctic conditions and to assist in safe recovery. Lab required. Special fees apply. Cross-listed with AVTY F231. (3+0)

EMS F261 **EMT: Emergency Medical Technician II**
3 Credits Offered Spring
Advancement of EMT I skills and knowledge through advanced techniques in fluid therapy and advance airway management. Includes use of specific drug therapy. Special fees apply. ***Prerequisites: EMT I certification and proof of 10 patient contacts as an EMT I.*** (2+2)

EMS F265 **Emergency Medical Technician III**
2 Credits Offered Fall
Introduction to basic cardiac anatomy and physiology, cardiac electrophysiology, recognition and treatment of basic lethal arrhythmias, use of monitor, defibrillator and pharmacological management. Special fees apply. ***Prerequisites: EMT II certification and proof of 10 patient contacts and 10 venipunctures as an EMT II.*** (0.5+3)

EMS F267 **Advanced Medical Procedures**
1 Credit Offered as Demand Warrants
State requirements for recertification at the EMT II or III levels. Reviews advanced medical skills and emergency medical procedures at the EMT II and III levels. Emergency medical care procedural changes, newly developed equipment and its use, changes in state certification and other medical-legal requirements. Course may be repeated ten times but not for credit. Graded Pass/Fail. Special fees apply. ***Prerequisites: Current EMT II or III certification.*** (0.5+1)

EMS F280 **Paramedicine I**
12 Credits Offered Fall, As Demand Warrants
Introduction to emergency medical services, the roles and responsibilities of a paramedic and medical/legal/ethical issues. Basic pathophysiology, pharmacology, venous access and advanced airway management techniques. Also includes an in-depth look at the circulatory, respiratory and nervous systems which includes interpretation of cardiac rhythms, pharmacology and advanced cardiac life support. Note: Student must apply for admission into the Paramedic Academy. Applications are reviewed by the Paramedic Advisory board. Special fees apply. ***Prerequisites: EMS F170. Recommended: HTLH F114 or equivalent. Note: Student must have the strength to be able to move patients, sufficient vision to assess the condition of the patient and the dexterity to perform the skills of a paramedic.*** (8+8)

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EMS F282 **Paramedicine II**
12 Credits Offered Spring, As Demand Warrants
Assessment and management of medical emergencies, geriatrics, pediatrics and traumatic injuries. Includes pediatric advanced life support and basic trauma life support certifications. Special fees apply. ***Prerequisites: EMS F280. Note: Student must have the strength to be able to move patients, sufficient vision to assess the condition of the patient and the dexterity to perform the skills of a paramedic.*** (8+8)

EMS F283 **Paramedic Internship**
12 Credits Offered Spring
Prehospital field experience under the guidance of a paramedic preceptor on an advanced life support ambulance. Interns perform all aspects of paramedic care. Special fees apply. ***Prerequisites: EMS F183; EMS F277. Note: Student must have the strength to be able to move patients, sufficient vision to assess the condition of the patient and the dexterity to perform the skills of a paramedic.*** (0+24)

EMS F287 **Paramedic Refresher**
3 Credits Offered as Demand Warrants
Integration of paramedicine knowledge and techniques with evaluation of applied skills. ***Prerequisites: Current State of Alaska or National Registry paramedic license. Note: Student must have the strength to be able to move patients, sufficient vision to assess the condition of the patient and the dexterity to perform the skills of a paramedic.*** (2+2)

ENGINEERING AND SCIENCE MANAGEMENT

A per semester fee for computing facilities will be assessed for one or more courses. This fee is in addition to any materials fees.

ESM F422 **Engineering Decisions**
3 Credits Offered Spring
Risk and uncertainty in engineering decisions. Basic applied probability and statistics, data analysis, regression analysis and time series. Practical applications of decision tools: linear programming, inventory analysis, queuing, network models and utility theory. Engineering judgment and uncertainty. Public safety and ethics. ***Recommended: Calculus through MATH F302.*** Stacked with ESM F622. (3+0)

ESM F450 W **Economic Analysis and Operations**
3 Credits
Fundamentals of engineering economy, project scheduling, estimating, legal principles, professional ethnics and human relations. Note: Not offered for credit toward the M.S. degree in Engineering Management or Science Management. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; ES F201 or CS F201; senior standing in engineering; or permission of instructor. Note: Undergraduate engineering students who are taking graduate ESM courses as technical electives should have completed or be concurrently enrolled in ESM F450.*** (3+0)

ESM F601 **Managing and Leading Engineering Organizations**
3 Credits Offered Fall Even-numbered Years
Leadership knowledge and skills as applied to motivation, direction and communication within engineering and technical organizations, and their relations with other organizations and the public. Leadership training complements management knowledge and activities such as organizational structures, planning, monitoring, directing and controlling. The general tools of management are reviewed including management theory, communications, conflict management and resolution. ***Recommended: B.S. degree in engineering or physical science or permission of instructor.*** (3+0)

ESM F605 **Engineering Economic Analysis**
3 Credits Offered Spring Even-numbered Years
The economic basis of engineering decisions. Graduate level studies of capital investment analysis techniques, including present worth, annual cash flow and rate of return. Applications to replacement problems, benefits/cost analysis and capital budgeting. Consideration of impacts of depreciation accounting, income taxes and inflation. Risk and uncertainty in economic decisions. Simulation. ***Recommended: Graduate standing.*** (3+0)

ESM F608 **Legal Principles for Engineering Management**
3 Credits Offered Fall Odd-numbered Years
Those aspects of law specifically related to technical management. Contracts, sales, real property, business organization, labor, patents and insurance. ***Recommended: Graduate standing.*** (3+0)

ESM F609 **Project Management**
3 Credits Offered Spring Even-numbered Years
Organizing, planning, scheduling and controlling projects. Use of CPM and PERT; computer applications. Case studies of project management problems and solutions. ***Recommended: Graduate standing or permission of instructor.*** (3+0)

ESM F620 **Statistics for ESM**
3 Credits Offered as Demand Warrants
Forecasting applications and technique — technological, time series, judgmental and regression; decision trees; Bayesian statistics; utility theory with trade-offs between expected value and risk in decision making; bidding strategies; and data analysis. ***Recommended: MATH F202X; STAT F200X.*** (3+0)

ESM F621 **Operations Research**
3 Credits Offered as Demand Warrants
Mathematical techniques for aiding technical managers in decision making. Linear programming, transportation problem, assignment problem, network models, PERT/CPM, inventory models, waiting line models, computer simulation, dynamic programming. Emphasis on use of techniques in actual technical management situations. Computer applications. ***Recommended: MATH F202X; STAT F200X.*** (3+0)

ESM F622 **Engineering Decisions**
3 Credits Offered Spring
Risk and uncertainty in engineering decisions. Basic applied probability and statistics, data analysis, regression analysis and time series. Practical applications of decision tools: linear programming, inventory analysis, queuing, network models, utility theory. Engineering judgment and uncertainty. Public safety and ethics. A class project and paper are required. ***Recommended: Calculus through MATH F302.*** (3+0)

ESM F684 **Engineering Management Project**
3 Credits
Comprehensive study of an actual engineering management problem resulting in reports and presentations which include recommendations for action. ***Prerequisites: Graduate standing in Engineering Science Management or permission of instructor.*** (3+0)

ENGINEERING SCIENCE

A per semester fee for computing facilities will be assessed for one or more CEM courses. This fee is in addition to any materials fees.

ES F101 **Introduction to Engineering**
3 Credits
Overview of the engineering profession and introduction to the fields of engineering. Basic concepts from engineering, physics and mathematics applied to engineering problem solving. Basic skills required of engineers, including an introduction to engineering communications: word processing, descriptive geometry, orthographic and isometric drawings, graphs, computer graphics and use of spreadsheets. Special fees apply. ***Prerequisites: MATH F107X. Co-requisites: MATH F108 or calculus placement.*** (2+2)

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ES F166 **Electric Car Conversion**
2 Credits Offered Summer
An introduction to the principles of electrical vehicle propulsion systems. Fundamentals of electrical motors, electrical motor controls, electrical energy storage systems and automotive power-train design. Students will conduct practical design projects culminating with a complete electric car conversion. Relevant codes and standards will be emphasized. (1+3)

ES F201 **Computer Techniques**
3 Credits
Basic computer programming, in C/C++, with applications from all fields of engineering. Introduction to MATLAB. ***Prerequisites: MATH F107X and MATH F108 OR enrollment in MATH F200X.*** (2+3)

ES F208 **Mechanics**
4 Credits
Engineering-oriented coverage of statics and dynamics. Vector methods used where appropriate. ***Prerequisites: ES F101 or GE F101 or MIN F103 or PETE F104; MATH F201X; PHYS F211X.*** (3+3)

ES F209 **Statics**
3 Credits
Force systems in two and three dimensions. Composition and resolution of forces and force systems; principles of equilibrium applied to various bodies, simple structures, friction, centroids, moments of inertia. Vector algebra used where appropriate. ***Prerequisites: ES F101. Co-requisites: MATH F201X; PHYS F211X.*** (3+0)

ES F210 **Dynamics**
3 Credits
Motion of particles, kinematics and kinetics of plane motion of rigid bodies, and principles of work and energy, impulse and momentum. Vector methods used where appropriate. ***Prerequisites: ES F209.*** (3+0)

ES F301 **Engineering Analysis**
3 Credits
Application of mathematical tools to typical engineering design problems. Selected topics from all fields of engineering. ***Prerequisites: ES F201; MATH F302.*** (3+0)

ES F307 **Elements of Electrical Engineering**
3 Credits Offered Fall
Elementary circuits and theorems, natural, forced and steady state response, principles of electronics, circuit models and system parameters, elements of measurement and instrumentation, characteristics of DC machines, and AC machines and transformers. ***Prerequisites: MATH F202X or permission of instructor.*** (3+0)

ES F331 **Mechanics of Materials**
3 Credits
Analysis of internal forces in members subjected to axial, torsional and flexural loads, singly and in combination. Stress-strain relationships and material property definitions; shear and moment diagrams, Mohr's Circle. Applications include beams, columns, connections and indeterminate cases. ***Prerequisites: ES F208 or ES F209; MATH F201X.*** (2+3)

ES F341 **Fluid Mechanics**
4 Credits
Statics and dynamics of fluids; energy and momentum principles. Dimensional analysis; flow in open channels, closed conduits and around submerged bodies. Special fees apply. ***Prerequisites: ES F208 or ES F210; MATH F201X.*** (3+3)

ES F346 **Basic Thermodynamics**
3 Credits
Thermodynamic systems, properties, processes and cycles. Fundamental principles of thermodynamics (first and second laws), and elementary applications. ***Prerequisites: MATH F201X; PHYS F211X.*** (3+0)

ENGLISH

It is the policy of the English Department to drop from the class roll any student who fails to attend either of the first two meetings of a basic course (ENGL F111X, ENGL F200X, ENGL F211X, ENGL F213X) regardless of whether or not fees have been paid.

Developmental English

DEVE F060 **Preparatory College Writing I**
3 Credits
Intensive work in the process of writing and revising to improve one's writing skills. ***Prerequisites: Appropriate placement test scores or permission of instructor.*** (3+0)

DEVE F068 **College Writing Skills**
1-3 Credits
Individualized instruction in written language skills. Open entry/open exit, one credit modules in spelling/vocabulary, writing and grammar usage. Enrollment in one or more modules based on diagnosed need or student decision; may be repeated. Does not fulfill degree requirements in written communications or humanities. Graded Pass/Fail. (1-3+0)

DEVE F070 **Preparatory College Writing II**
3 Credits
Instruction in writing to improve students' fluency, accuracy and communication skills. Preparation for ENGL F111X. Also available through the Center for Distance Education. ***Prerequisites: Appropriate placement test scores or permission of instructor.*** (3+0)

DEVE F109 **Preparatory College Writing III**
3 Credits
Strengthen preparatory college writing skills they need for ENGL F111X, including research, writing and revising, and critical reading skills. ***Prerequisites: Appropriate placement test scores or permission of instructor.*** (3+0)

English

ENGL F104 **Institute on Language, Thought and Culture**
3 Credits Offered as Demand Warrants
Development of critical thinking, writing, and reading skills using the Bard College model. The intensive institute establishes and nurtures learning communities which support bold thinking, risk-taking, collaboration and independence. Offered only at the Kuskokwim Campus. (3+0)

ENGL F111X **Introduction to Academic Writing**
3 Credits
Instruction and practice in written inquiry and critical reading. Introduction to writing as a way of developing, exploring and testing ideas. Concentration on research methods and techniques. Available via Independent Learning. ***Prerequisites: Placement examination or DEVE F070 with a grade of A or B; DEVE F109 or DEVS F104. Co-requisites: DEVS F058 or DEVS F105 in some cases dependent on reading placement scores.*** (3+0)

ENGL F200X **World Literature** (h)
3 Credits
Introduction to reading and appreciation of a wide variety of literary texts from different cultures. Includes exposure to a variety of approaches to myth, poetry, story telling and drama. Students will gain an understanding of cultural differences and universals in texts from American, American minority, Western European and non-Western sources. Specific content to be announced at time of registration. Course may be repeated for credit when content varies. ***Prerequisites: ENGL F111X or placement in ENGL F211X/ENGL F213X; sophomore standing; or permission of instructor.*** Cross-listed with FL F200X. (3+0)

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ENGL F211X **Academic Writing about Literature**
3 Credits
Instruction in writing through close analysis of literature. Research paper required. Strongly recommended for English and other humanities majors. Also available through the Center for Distance Education. ***Prerequisites: ENGL F111X or its equivalent. Recommended: Sophomore standing.*** (3+0)

ENGL F212 **Business, Grant, and Report Writing**
3 Credits Offered as Demand Warrants
Forms and techniques of business, grant, and report writing. (Special emphasis may be placed on one or another of these topics in a given semester.) Does not fulfill the second half of the baccalaureate requirements in written communication. Also available through the Center for Distance Education. ***Prerequisites: ENGL F111X.*** (3+0)

ENGL F213X **Academic Writing about the Social and Natural Sciences**
3 Credits
Instruction in critical reading and argumentative writing by reading and responding to essays from the social and natural sciences. Concentration on the research methods and techniques necessary to create an extended written argument. Also available through the Center for Distance Education. ***Prerequisites: ENGL F111X or equivalent. Recommended: Sophomore standing.*** (3+0)

ENGL F217 **Introduction to the Study of Film** (h)
3 Credits Offered Spring
An appreciation course designed to introduce the student to the various forms of cinematic art with special emphasis on humanistic and artistic aspects. ***Prerequisites: ENGL F111X.*** Cross-listed with FLM F217; JRN F217. (2+2)

ENGL F218 **Themes in Literature** (h)
3 Credits Offered as Demand Warrants
Exploration of literary themes in various genres of literature, including fiction, poetry and drama. Such themes as "Women in Literature," "Literature of the North," and "Detective Stories in Literature and Film" may be offered. Specific theme is announced at registration. Course may be repeated for credit when content varies. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

ENGL F219 **Aleut Narrative Art**
3 Credits Offered as Demand Warrants
Introduction to and survey of the oral and written literature of the Unangan, the Aleut people. All works in English translation, although some supplementary materials in the Aleut language (eastern and western dialects). Offered at the Interior Aleutian campus. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

ENGL F230 **English Language Proficiency**
3 Credits Offered Fall
Intensive listening, speaking, reading and writing in English. Especially recommended for all students for whom English is a foreign language. This course does not meet general degree requirements in written communications and is not classified as a humanities. Course may be repeated once for credit. Note: Open only to students for whom English is a foreign language. ***Prerequisites: Permission of instructor.*** (3+0)

ENGL F231 **English Language Proficiency**
3 Credits Offered Spring
Intensive listening, speaking, reading and writing in English. Especially recommended for all students for whom English is a foreign language. This course does not meet general degree requirements in written communications and is not classified as a humanities. Course may be repeated once for credit. ***Prerequisites: Permission of instructor. Note: Open only to students for whom English is a foreign language.*** (3+0)

ENGL F271 **Introduction to Creative Writing: Fiction** (h)
3 Credits
Forms and techniques of fiction for beginning students; discussion of students' work in class and in individual conferences. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

ENGL F272 **Introduction to Creative Writing: Poetry** (h)
3 Credits Offered Fall
Forms and techniques of poetry for beginning students; discussion of students' work in class and in individual conferences. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

ENGL F280 **Introduction to Colonial and Postcolonial Literature** (h)
3 Credits Offered Fall Even-numbered Years
Includes readings from the literature of formerly colonized nations. Texts may be chosen from African, Asian, American and Pacific Rim cultures. Although the colonial and postcolonial periods will be central to our investigations, precolonial and ancient cultures may also be considered for the purpose of establishing cultural perspectives. May be repeated twice for credit. ***Prerequisites: ENGL F211X or ENGL F213X. Recommended: ENGL F200X.*** (3+0)

ENGL F290 **Summer Reading Program (Honors)** (h)
2 Credits Offered Fall
Selected readings in a variety of disciplines. Group discussions and written responses to the readings follow in the fall. Students keep a summer journal. May be repeated for credit. ***Prerequisites: ENGL F111X; enrollment in the Honors Program; or permission of instructor.*** (2+0)

ENGL F301 **Continental Literature in Translation: The Ancient World** (h)
3 Credits Offered Fall Even-numbered Years
Readings from ancient Mesopotamian, Greek and Roman texts: the classical background out of which western literary tradition has risen. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

ENGL F302 **Continental Literature in Translation: Medieval and Renaissance** (h)
3 Credits Offered Fall Odd-numbered Years
Readings from the works of such writers as Dante, Macchiavelli, Petrarch, Boccaccio, Rabelais, Margherite de Navarre, Calderon della Barca and Cervantes. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

ENGL F306 **Survey of American Literature: Beginnings to the Civil War** (h)
3 Credits Offered Fall
Comprehensive study of American thought as reflected in the works of early explorers, Calvinists, Rationalists and Transcendentalists. Also available through the Center for Distance Education. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

ENGL F307 **Survey of American Literature: Civil War to the Present** (h)
3 Credits Offered Spring
Comprehensive study of American thought as reflected in the writers of Realism, Naturalism, Modernism, and Post-modernism. Also available through the Center for Distance Education. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

ENGL F308 **Survey of British Literature: Beowulf to the Romantic Period** (h)
3 Credits Offered Fall
Survey of writers and works in Old and Middle English, including Chaucer, through Elizabethan period (Shakespeare), Restoration, and Neoclassic period of the 18th century. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

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ENGL F309 **Survey of British Literature: Romantic Period to the Present** (h)
3 Credits Offered Spring
Survey of writers and works from the early Romantic period (Blake and Burns), through the Victorian period, James Joyce, and stream-of-consciousness, to the present. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

ENGL F310 **Literary Criticism** (h)
3 Credits Offered Spring
History and principles of literary criticism, from earliest days to present. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

ENGL F313 W **Writing Non-Fiction Prose** (h)
3 Credits Offered Spring
Instruction in writing for students who wish to develop proficiency in organizing and composing essays on factual material in which they have genuine interest. Readings and research paper required. Course does not fulfill the second half of the general degree requirement in written communication. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; junior standing; or permission of instructor.*** (3+0)

ENGL F314 W,O/2 **Technical Writing** (h)
3 Credits
Writing business letters (letters of inquiry, complaint, evaluation, and job application with resume), preparing tables, graphs, process descriptions, technical instructions, abstracts, grant proposals, and technical reports (progress, laboratory, survey, incident, inspection, feasibility and research). Course does not fulfill the second half of the requirement in written communication. Also available through the Center for Distance Education. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; junior standing; or permission of instructor.*** (3+0)

ENGL F317 **Traditional English Grammar** (h)
3 Credits Offered Fall
Identification and usage of the more common types of phrase and sentence structures. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

ENGL F318 **Modern English Grammar** (h)
3 Credits Offered Spring
Structure of current English as seen through traditional and contemporary grammatical theories. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

ENGL F333 **Women's Literature** (h)
3 Credits Offered Fall
Reading, discussing and analyzing literary works dealing with the social, cultural and political implications of patriarchal structures and traditions from the perspective of feminist theory and criticism. Focus may be on a particular theme, period or genre, but readings will include both primary and secondary texts. ***Prerequisites: ENGL F111X. Recommended: ENGL F211X.*** Cross-listed with WMS F333. (3+0)

ENGL F340 **Contemporary Native American Literature** (h)
3 Credits Offered Fall
Contemporary Native American writing in English, including novels, short stories, poetry and plays. Examples of Native American film when related to a written work. Works discussed in relation to cultural contexts and interpretations. ***Prerequisites: ENGL F111X or permission of instructor.*** Cross-listed with ANS F340. (3+0)

ENGL F341 **Contemporary Alaska Native Literature** (h)
3 Credits Offered as Demand Warrants
Contemporary Alaska Native literature including novels, short stories, poetry and plays. Bibliography, genres and viewpoints, structural and thematic features of stories. May concentrate on specific regional areas of the state. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

ENGL F347 **Voices of Native American Peoples** (h)
3 Credits Offered Spring Even-numbered Years
Exploration of the forms by which Native American peoples have narrated their life experiences. Includes oral narratives, written autobiographies, memoirs and speeches, and an introduction to the social, historical and cultural content surround these texts. Readings selected from all of North America with an emphasis on Alaska Natives. ***Prerequisites: ENGL F111X.*** Cross-listed with ANS F347. (3+0)

ENGL F349 **Narrative Art of Alaska Native Peoples (in English Translation)** (h)
3 Credits Offered Fall Even-numbered Years
Traditional and historical tales by Aleut, Eskimo, Athabascan Eyak, Tlingit, Haida and Tsimshian storytellers. Bibliography, Alaska Native genres and viewpoints, and structural and thematic features of tales. Also available through the Center for Distance Education. ***Prerequisites: ENGL F111X or permission of instructor.*** Cross-listed with ANS F349. (3+0)

ENGL F350 **Literature of Alaska and the Yukon Territory** (h)
3 Credits Offered Spring Odd-numbered Years
Representative fiction, verse and nonfiction dealing with Alaska and the Yukon Territory. Also available through the Center for Distance Education. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

ENGL F360 **Multi-Ethnic Literatures of the United States** (h)
3 Credits Offered Fall Odd-numbered Years
Ethnic American writings. Includes Native American, Asian American, Hispanic American, African American, Jewish American, immigrant and other traditions of literary expression. Ethnic writings will be compared to mainstream American literature. ***Prerequisites: ENGL F111X or permission of instructor.*** (3+0)

ENGL F371 W **Intermediate Creative Writing** (h)
3 Credits
Practice and guidance in writing fiction, poetry, drama or essays. Students' work read and discussed in class and in conference with the instructor. Close study of the techniques of established writers. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; ENGL F271 or ENGL F272; or permission of instructor.*** (3+0)

ENGL F380 **Topics in Colonial and Postcolonial Literature** (h)
3 Credits Offered Spring Even-numbered Years
Focus on a particular topic in selected colonial and postcolonial literary texts. Readings will be chosen for their relevance to a particular theme, to be announced by the instructor. Topic will vary from one semester to another, but the goal will be to explore the significance and importance of the chosen topic as it manifests itself in the literature. Readings and discussions will foster in-depth understanding of texts dealing with the chosen topic. Possible topics might include: war and peace, economic imperatives, environmental perspectives, sickness and health, and gender issues. May be repeated three times for credit. ***Prerequisites: ENGL F200X. Recommended: ENGL F280.*** (3+0)

ENGL F403 W,O/2 **American Renaissance** (h)
3 Credits Offered Every Third Spring
American literature of the mid-nineteenth century: Poe through Whitman. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor. Recommended: ENGL F306 but not required.*** (3+0)

ENGL F404 O/2 **American Realism** (h)
3 Credits Offered Every Third Spring
American literature from the Civil War to World War I: Twain through James. ***Prerequisites: COMM F131X or COMM F141X; ENGL F211X or ENGL F213X; or permission of instructor. Recommended: ENGL F306 and ENGL F307 desirable but not required.*** (3+0)

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ENGL F405 **British Writers of the 19th Century: Romantic Period** (h)
3 Credits Offered Every Third Fall
English literary romanticism including authors such as Byron, Keats, Shelley, Coleridge, Wordsworth, Austen, the Bronte sisters and Scott. ***Prerequisites: ENGL F211X or ENGL F213X; or permission of instructor. Recommended: ENGL F309.*** (3+0)

ENGL F406 **British Writers of the 19th Century: Victorian Period** (h)
3 Credits Offered Every Third Fall
Impact of industrialization, social reformation, religious controversy and philosophical attitudes on literature. Authors to include (but not limited to): Browning, Tennyson, Thackeray, Eliot, Arnold, Dickens, Hazlitt, Ruskin, and Meredith. ***Prerequisites: ENGL F211X or ENGL F213X or permission of instructor. Recommended: ENGL F309 desirable but not required.*** (3+0)

ENGL F407 **British Writers of the Restoration and 18th Century: Neo-Classical Period** (h)
3 Credits Offered Every Third Fall
Developments in drama, verse and prose reflecting new forces in government, religion, and society during the Augustan Age. Attention to the mode of satire and to the fashion of sentimentalism in all genres. Authors to include (but not limited to): Dryden, Defoe, Addison, Steele, Swift, Pope, Johnson, Boswell, Goldsmith and Sheridan. ***Prerequisites: ENGL F211X or ENGL F213X or permission of instructor. Recommended: ENGL F308.*** (3+0)

ENGL F408 W,O/2 **American Origins** (h)
3 Credits Offered Every Third Spring
Writers who contributed to the development of a national literary identity: Bradstreet through Cooper. ***Prerequisites: ENGL F111X; ENGL 211X or ENGL 213X; COMM F131X or F141X; or permission of instructor. Recommended: ENGL F306 but not required.*** (3+0)

ENGL F414 W **Research Writing** (h)
3 Credits Offered Fall
Practice in reporting primary and secondary research in the forms and styles appropriate to the student's field. Preference given to seniors. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or their equivalent or permission of instructor.*** (3+0)

ENGL F421 **Chaucer and His Age** (h)
3 Credits Offered Spring Odd-numbered Years
Major poetry of Chaucer and his contemporaries, with emphasis on The Canterbury Tales, and survey of criticism. ***Prerequisites: ENGL F211X or ENGL F213X or permission of instructor. Recommended: ENGL F308 desirable but not required.*** (3+0)

ENGL F422 W,O/2 **Shakespeare: History, Plays and Tragedies** (h)
3 Credits Offered Fall
Major chronicle plays and tragedies, including significant criticism. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor. Recommended: ENGL F308 desirable but not required.*** (3+0)

ENGL F425 W,O/2 **Shakespeare: Comedies and Non-Dramatic Poetry** (h)
3 Credits Offered Spring
Major comedies and non-dramatic poems, including significant criticism. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor. Recommended: ENGL F308 desirable but not required.*** (3+0)

ENGL F426 O/2 **Milton** (h)
3 Credits Offered Every Third Spring
Major poetry and prose, and survey of Miltonian criticism. ***Prerequisites: COMM F131X or COMM F141X; ENGL F211X or ENGL F213X; or permission of instructor. Recommended: ENGL F308 desirable but not required.*** (3+0)

ENGL F427 **Topics in Film Studies** (h)
3 Credits Offered Spring
Intensive study of variable topics in film studies. May focus on themes such as race or war in film; a specific period such as films of the 1940's: particular genres such as horror, film noir, or the musical, an important director, or an aspect of contemporary film theory. Intensive readings and research in contemporary film theory and criticism will foster in-depth understanding of chosen topic. Course may be repeated two times for credit when content varies. ***Prerequisites: ENGL F217 or FLM F217; ENGL F211X or ENGL F213X; or permission of instructor.*** Cross-listed with FLM F427. (2+2)

ENGL F444 W **Fiction in Translation** (h)
3 Credits Offered Spring Even-numbered Years
Major fiction in English translation. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (3+0)

ENGL F445 **Drama after 1900** (h)
3 Credits Offered Fall Even-numbered Years
The major dramatists and their achievements. ***Prerequisites: ENGL F211X or ENGL F213X or permission of instructor.*** (3+0)

ENGL F446 **Major Modern and Contemporary Poetry** (h)
3 Credits Offered Spring Even-numbered Years
Yeats to the present. ***Prerequisites: ENGL F211X or ENGL F213X or permission of instructor.*** (3+0)

ENGL F447 O/2 **British Prose after 1900** (h)
3 Credits Offered Fall Odd-numbered Years
Study of fiction and nonfiction prose, modern and contemporary. ***Prerequisites: COMM F131X or COMM F141X; ENGL F211X or ENGL F213X; or permission of instructor.*** (3+0)

ENGL F448 W,O/2 **American Prose after 1900** (h)
3 Credits Offered Spring Odd-numbered Years
Study of fiction and nonfiction prose, modern and contemporary. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (3+0)

ENGL F452 O/2 **The British Novel to 1900** (h)
3 Credits Offered Every Third Fall
Origin and development of the novel with concentration on significant novelists from Daniel Defoe to Thomas Hardy. ***Prerequisites: COMM F131X or COMM F141X; ENGL F211X or ENGL F213X; or permission of instructor.*** (3+0)

ENGL F462 **Applied English Linguistics** (h)
3 Credits Offered Spring Even-numbered Years
Topic(s) for each offering of the course are announced. Examples include teaching English as a second language, dialects and education, dictionaries, stylistics, and composition. ***Prerequisites: ENGL F211X or ENGL F213X or permission of instructor.*** (3+0)

ENGL F471 W **Undergraduate Writers' Workshop** (h)
3 Credits
Discussion of craft and techniques and student work. For advanced students who prepare a manuscript as a final project. May be repeated one time for credit. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; ENGL F371; or permission of instructor.*** (3+0)

ENGL F472 **History of the English Language** (h)
3 Credits Offered Spring Odd-numbered Years
Origin and development of the English language from prehistoric times to the present. ***Prerequisites: ENGL F211X or ENGL F213X or permission of instructor. Recommended: ENGL F318 or a linguistics course is desirable, but not required.*** (3+0)

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ENGL F482 **Undergraduate Seminar** (h)
3 Credits Offered Spring Odd-numbered Years
Intensive study of selected topics in the discipline. ***Prerequisites: ENGL F211X or ENGL F213X or permission of instructor.*** (3+0)

ENGL F485 **Teaching Composition in the Schools**
3 Credits Offered Spring Even-numbered Years
Theoretical background and workshop experience for teaching composition in middle and high schools with current pedagogy on teaching of writing stressed. Variety of teaching methods demonstrated, practiced and discussed. ***Prerequisites: ENGL F211X or ENGL F213X or permission of instructor.*** (3+0)

ENGL F488 W **Dramatic Writing** (h)
3 Credits Offered Fall Odd-numbered Years
Introduction to the craft of dramatic writing for theater and film, with an emphasis on dramatic storytelling. Course will focus on giving students a practical understanding of the uses of story structure, setting, character, plot and dialog, and how these elements work together to create compelling drama. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** Cross-listed with FLM F488; THR F488. (3+0)

ENGL F601 **Theory, Criticism and Methods**
3 Credits Offered Spring
A study of the theoretical debates that inform contemporary criticism, and of the methods for conducting and evaluating research. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F603 **Studies in British Literature: Old and Middle English**
3 Credits Offered Fall Odd-numbered Years
Variable subject matter in significant topics in Anglo-Saxon and Middle English literature. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F604 **Studies in British Literature: Renaissance and 17th Century**
3 Credits Offered Fall Even-numbered Years
Variable subject matter in significant topics in 16th and 17th-century British literature. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F606 **Studies in British Literature: Restoration and 18th Century**
3 Credits Offered Fall Odd-numbered Years
Variable subject matter in significant topics in British literature of the Restoration period and the 18th century. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F607 **Studies in British Literature: 19th Century**
3 Credits Offered Fall Even-numbered Years
Variable subject matter in significant topics in British literature of the Romantic and Victorian periods. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F608 **Studies in British Literature after 1900**
3 Credits Offered Spring Odd-numbered Years
Variable subject matter in significant topics in modern British literature. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F609 **Early and Romantic American Literature**
3 Credits Offered Fall Odd-numbered Years
Variable subject matter in significant topics of the colonial, national, and romantic periods of American literature. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F611 **American Realism and Modernism**
3 Credits Offered Spring Even-numbered Years
Variable subject matter in significant topics in American literature of the late 19th and early 20th centuries. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F612 **Twentieth Century American Literature**
3 Credits Offered Spring Even-numbered Years
Variable subject matter in American Literature of the 20th century. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F614 **Studies in Comparative Literature**
3 Credits Offered Spring Odd-numbered Years
Advanced study in literature on a transnational basis with varying emphases, including literature of particular locales, modes or themes. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F615 **Contemporary Literature**
3 Credits Offered Spring Even-numbered Years
Variable subject matter in significant topics in post-World War II literature. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F620 **Images of the North**
3 Credits Offered Spring Even-numbered Years
Interdisciplinary approaches to the variety of images created about and by the people and environment of the circumpolar North. The course will analyze conceptualizations of the North as expressed in a number of media such as film, art, literature, travel journals and oral tradition employing methodologies from many disciplines. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with NORS F620. (3+0)

ENGL F661 **Mentored Teaching in English**
1 Credit
Mentored teaching provides consistent contact on course related issues between teaching assistants and mentoring faculty. Graded Pass/Fail. ***Prerequisites: Acceptance into the M.A., M.F.A. in creative writing program, or M.F.A./M.A. combined degree program, and a teaching assistantship award. Note: Teaching assistants are required to be enrolled in a mentored teaching section while teaching. May be repeated up to six times, for one credit per semester.*** (1+0+2)

ENGL F671 **Writers' Workshop**
3 Credits
The writing of verse, fiction, drama or nonfiction prose in accordance with the individual student's needs and the instructor's specialization. Depending on available staff, the workshop may be limited during any semester to work in a particular genre. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F681 **Forms of Poetry**
3 Credits Offered Every Third Semester
Intensive study of the forms and techniques of poetry writing. Includes readings and poetry writing exercises. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F682 **Forms of Fiction**
3 Credits Offered Every Third Semester
Advanced study in narrative technique through analysis of selected fiction and the students' own writing. Variable content in terms of the writers to be studied and the kinds of narrative writing to be assigned. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F684 **Forms of Non-Fiction Prose**
3 Credits Offered Every Third Semester
Intensive study of the forms and techniques of nonfiction. Includes readings and writing exercises. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F685 **Teaching College Composition**
3 Credits Offered Fall
An investigation into current practice and theory with demonstrations and reports on pedagogy. Required of all teaching assistants in English. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

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ENGL F686 **Teaching Writing in a Cross-Cultural Context**
3 Credits Offered as Demand Warrants
Contemporary methods of teaching writing in middle school and high school classrooms, with special emphasis on cross-cultural issues and pedagogy and on contemporary rhetorical theory. Includes methodologies and theoretical underpinnings of teaching grammar and fiction writing. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F688 **Writing for Film and Television**
3 Credits Offered Spring Odd-numbered Years
Advanced training in dramatic writing for film and television, with a focus on cinematic story structure, visual imagery, dialogue, pacing, continuity and manuscript format. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

ENGL F692 **Graduate Seminar**
3 Credits Offered as Demand Warrants
Intensive study of selected topics in the discipline. (3+0)

ENGLISH AS A SECOND LANGUAGE

ESLG F051 **Speaking English as a Second Language**
1-3 Credits Offered as Demand Warrants
Engaging in English conversation. For students who do not speak English as their first language, but who can understand and follow simple instructions in English. The emphasis is on large quantities of comprehensible English, and building student confidence in understanding and speaking it. May be repeated up to nine credits. (1-3+0)

ESLG F061 **Reading English as a Second Language**
1-3 Credits Offered as Demand Warrants
Language experience approach and other methods are used to increase students' abilities and to build their confidence in reading English as it is encountered everyday. For students whose first language is not English, this class provides an opportunity to develop the skills involved in reading simple passages in English. May be repeated up to nine credits. (1-3+0)

ESLG F071 **Writing English as a Second Language**
1-3 Credits Offered as Demand Warrants
Developing skills at writing simple English compositions. For students whose first language is not English. The emphasis is on writing large quantities of English which is understandable to native English speakers, and on building students' confidence in communicating through written English. May be repeated up to nine credits. (1-3+0)

ENVIRONMENTAL ENGINEERING/ENVIRONMENTAL QUALITY SCIENCE

A per semester fee for computing facilities will be assessed for one or more CEM courses. This fee is in addition to any materials fees.

ENVE F458 **Energy and the Environment**
3 Credits Offered Fall Odd-numbered Years
Overview of basic concepts of energy supply, demand, production of heat and power impacts of energy use on the environment. Extensive discussion of mitigation technologies and strategies for meeting energy needs while preserving environmental quality. ***Prerequisites: CHEM F106X; ES F346 or equivalent; MATH F201X; PHYS F211X.*** Cross-listed with ME F458. Stacked with ENVE F658; ME F658. (3+0)

ENVE F641 **Aquatic Chemistry**
3 Credits Offered as Demand Warrants
Chemistry of aquatic systems, including the development of equilibrium and kinetic models to understanding the speciation, transformation and partitioning of inorganic chemical species in natural and engineered water systems. Emphasis is on the study of acid-base chemistry, complexation, precipitation-dissolution and reduction-oxidation reactions. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with CHEM F605. (3+0)

ENVE F642 **Contaminant Hydrology**
3 Credits Offered Spring Odd-numbered Years
Theoretical and applied aspects of the movement of contaminants through saturated and unsaturated soil. ***Recommended: CE F663 or equivalent; graduate standing; or permission of instructor.*** (3+0)

ENVE F643 **Air Pollution Management**
3 Credits Offered as Demand Warrants
Air pollution topics including the quantity and quality of atmospheric emissions and their effects on the human environment. Identification and location of sources, measurement of quality and conformance with standards. Legal considerations of Clean Air Act and Amendments and local regulations. Evaluation of stationary and moving sources. Meteorology and modeling requirements. Control mechanisms for gases and particulates; and engineering economics. ***Recommended: CHEM 106X or equivalent; MATH F201X; graduate standing; or permission of instructor.*** (3+0)

ENVE F644 **Environmental Management and Law**
3 Credits Offered Spring Odd-numbered Years
Topics of environmental impact statements, environmental law (local, state and federal), public involvement and environmental quality. Impact from projects of mining, highways, airports, pipelines, industrial development, water, wastewater and solid waste, and others — theoretical considerations and case studies. ***Recommended: Graduate standing or permission of instructor.*** (3+0)

ENVE F645 **Unit Processes-Chemical and Physical**
3 Credits Offered Spring Even-numbered Years
Theory and design of chemical and physical unit processes for water and wastewater. Sedimentation, coagulation, flocculation, filtration, ion exchange, adsorption/absorption, gas transfer and other special topics. Emphasis on arctic applications and design. ***Recommended: MATH F201X; CHEM F106X or equivalent; graduate standing; or permission of instructor.*** (3+0)

ENVE F646 **Unit Processes — Biological**
3 Credits Offered Fall Odd-numbered Years
Theoretical and applied aspects of biological wastewater treatment, including waste-activated sludge processes, trickling filters, lagoons, sludge digestion and processing, nutrient removal, biology of polluted waters, state and federal regulations. ***Recommended: Graduate standing or permission of instructor.*** (3+0)

ENVE F647 **Biotechnology**
3 Credits Offered Fall Even-numbered Years
Theoretical and applied aspects of bioengineering. Issues studied include microbiology, metabolism, genetics, genetic engineering, enzymes and catalysis, stoichiometry and kinetics, biological reactor design and bioremediation. ***Recommended: Graduate standing or permission of instructor.*** (3+0)

ENVE F648 **Solid Waste Management**
3 Credits Offered Spring Even-numbered Years
Characterization, collection, disposal and treatment of municipal and industrial residuals. Emphasis on regulations that control waste management, waste generation rates, waste characterization procedures, the flow of materials in society, recycle/reuse and landfill disposal. ***Recommended: Graduate standing or permission of instructor.*** (3+0)

ENVE F649 **Hazardous and Toxic Waste Management**
3 Credits Offered Fall Odd-numbered Years
Course provides in-depth coverage of hazardous and toxic substance management including legal, economic and technical issues. Topics will include characterization of hazardous materials, economics of toxics minimization, hazardous materials use, storage and disposal, technical aspects of landfill siting, and selection and design of treatment technologies. Includes case studies of

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current waste management issues. ***Recommended: Bachelor's degree in science or engineering.*** Cross-listed with GE F649. (3+0)

ENVE F650 **Advanced Topics**
1 Credit Offered Fall
Presentations by students, faculty and outside experts on current issues in environmental science and engineering. Course may be repeated twice for credit. ***Prerequisites: Graduate standing.*** (1+0)

ENVE F651 **Environmental Risk Assessment**
3 Credits Offered Spring Odd-numbered Years
The characterization of population exposures and the evidence used to identify environmental substances that may pose a human health risk. The theory and methods for estimating risk: hazard identification, dose-response assessment, exposure assessment and risk characterization. ***Recommended: Undergraduate degree in engineering or natural science.*** (3+0)

ENVE F652 **Introduction to Toxicology for Engineers and Scientists**
3 Credits Offered Fall Even-numbered Years
Introduction to the science of toxicology for graduate students in fields that use information about hazardous chemicals for input into decisions. Topics include an overview of the effects of chemicals on cells, organs and organ systems, and the toxic effects of classes of chemicals such as pesticides, metals and solvents. Use of data from animal testing and common lists, factors and extrapolation are reviewed. ***Recommended: Undergraduate degree in engineering or natural science.*** (3+0)

ENVE F653 **Environmental Measurements Laboratory**
1 Credit Offered Spring
Introduction to analytical methods and measurement techniques used in environmental engineering and environmental quality science. Students will design, conduct and report on a laboratory experiment. Includes sample preparation techniques and analytical methods such as microscopy, atomic adsorption spectroscopy, gas chromatography, liquid chromatography and mass spectrometry. ***Recommended: ENVE F641.*** (0+3)

ENVE F658 **Energy and the Environment**
3 Credits
Basic concepts of energy supply, demand, production of heat and power impacts of energy use on the environment. Extensive discussion of mitigation technologies and strategies for meeting energy needs while preserving environmental quality. ***Recommended: CHEM F106X; ES F346 or equivalent; MATH F201X; PHYS F211X; graduate standing.*** Cross-listed with ME F658. Stacked with ENVE F458; ME F458. (3+0)

ENVIRONMENTAL STUDIES

ENVI F101 **Introduction to Environmental Science**
3 Credits Offered Spring
Introduces the interconnected topics that make up environmental science. By exploring Earth's systems, environmental questions are investigated such as how to sustainably use natural resources and the influence of population growth on ecosystems. The course takes a holistic approach to reinforce scientific principles. Key topics covered include ecosystem functions, energy, biodiversity, resource management, landscape alteration and climate change. ***Recommended: F100-level biology, chemistry or geology class.*** (3+0)

ENVI F110 **Introduction to Water Quality I: Measurement**
1 Credit Offered Spring
Introduces students to standard water quality methods used and applies them to rural Alaska. Students will become familiar with EPA water quality standards and programs that help preserve water quality in rural communities. Key topics covered include: stream ecology, wastewater management, storm water runoff and data analysis. (0.5+0+1.5)

ENVI F130 **Introduction to the National Environmental Policy Act**
1 Credit Offered Spring
Provides a brief introduction to the National Environmental Policy Act (NEPA). This course will explain what community members need to do to be heard in the NEPA process with special emphasis on public involvement and Environmental Impact Analysis (EIA). The course covers the roles and the content of scoping and Environmental Assessments in relation to key natural resource development projects in rural Alaska. (1+0)

ENVI F160 **Internship in Environmental Studies**
1-2 Credits Offered as Demand Warrants
Under the guidance of a UAF Bristol Bay Campus-approved agency or business (public or private that monitors, tests, analyzes or studies the environment), students gain supervised pre-professional experience in environmental studies. The intern will explore the interdisciplinary aspects of field or laboratory research, build practical expertise and make contacts. Internships make one to ten weeks of full-time commitment to the agency or business and when completed make public presentations on the experience. Graded Pass/Fail. ***Prerequisites: ENVI F101 or permission of instructor.*** (0+0+3.1-15.4)

ENVI F260 **Field Techniques for Environmental Technicians**
2 Credits Offered Summer
Provides hands-on instruction in interdisciplinary field and laboratory techniques used by environmental technicians. Basic methods for sampling and studying terrestrial or aquatic ecosystems will be introduced. Students will participate in data collection and analysis procedures as part of an independent research project. ***Prerequisites: ENVI F101 or NRM F101; ENVI F110; 4 credit lab-based F100-science course; or permission of instructor. Recommended: CIOS F100; CIOS F135.*** (1+3)

ENVI F265 **Introduction to Methods in Environmental Studies Reporting**
2 Credits Offered Fall
Introduces basic data collection methods used in environmental studies then concentrates on research skills necessary to analyze, interpret, and document field and laboratory data and the technical reporting processes. The course is designed to integrate raw environmental data into a technical report covered include ecosystem functions, energy, biodiversity, that can be presented in scientific meeting format. ***Prerequisite: ENVI F101 or NRM F101; ENVI F110; ENVI F260; a lab-based F100 level science course; or permission of instructor. Recommended: ENGL F104 or ENGL F111X; ENVI F160.*** (1.5+0+1.5)

ESKIMO

Note: Two semester-length courses in a single Alaska Native Language or other non-English language taken at the university level may replace 6 credits in the Perspectives on the Human Condition section of the Core. ESK F101-F102, F111-F112, F201-F202 or F211-F212 may be used to meet this requirement but then may not be used to meet humanities degree requirement.

ESK F101 **Elementary Central Yup'ik Eskimo** (h)
5 Credits Offered Fall
Introduction to Central Yup'ik, the language of the Yukon and Kuskokwim deltas and Bristol Bay. Open to both speakers and non-speakers. For speakers the course provides literacy and grammatical analysis. For others, it provides a framework for learning to speak, read and write the language. Consideration given to dialect differences. (5+0)

ESK F102 **Elementary Central Yup'ik Eskimo** (h)
5 Credits Offered Spring
Introduction to Central Yup'ik, the language of the Yukon and Kuskokwim deltas and Bristol Bay. Open to both speakers and non-speakers. For speakers the course provides literacy and grammatical analysis. For others, it provides

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a framework for learning to speak, read and write the language. Consideration given to dialect differences. (5+0)

ESK F103 **Conversational Central Yup'ik**
1-3 Credits Offered as Demand Warrants
Entry-level course to learn to speak and understand Yup'ik Eskimo. Focus on communication in everyday situations. Kuskokwim and Northwest Campuses only. ***Prerequisites: Permission of instructor.*** (1-3+0)

ESK F104 **Conversational Central Yup'ik**
3 Credits Offered as Demand Warrants
Entry-level course to learn to speak and understand Yup'ik Eskimo. Focus on communication in everyday situations. Kuskokwim and Northwest Campuses only. ***Prerequisites: ESK F103 or permission of instructor.*** (1-3+0)

ESK F106 **Introduction to Inupiaq Eskimo**
1 Credit
Entry-level course to learn to speak and understand basic words and phrases of the Inupiaq Eskimo language of the Northwest Arctic. Instruction is thematic and the focus is on communications for everyday situations. Graded Pass/Fail. (1+0)

ESK F109 **Central Yup'ik Orthography**
3 Credits Offered Fall
An entry-level class for persons fluent in Central Yup'ik. Covers reading, silent and oral, and writing, emphasizing specific skills and practical application of those skills through writing assignments. Dialect differences in the Central Yup'ik region are used to demonstrate standardization of the writing systems. ***Prerequisites: Demonstrated conversational Yup'ik skills.*** (3+0)

ESK F111 **Elementary Inupiaq Eskimo** (h)
5 Credits Offered Fall
Introduction to Inupiaq, the language of Unalakleet, Seward Peninsula, Kotzebue Sound and the North Slope. Open to both speakers and non-speakers. For speakers the course provides literacy and grammatical analysis. For others it provides a framework for learning to speak, read, and write the language. Consideration given to dialect differences. (5+0)

ESK F112 **Elementary Inupiaq Eskimo** (h)
5 Credits Offered Spring
Introduction to Inupiaq, the language of Unalakleet, Seward Peninsula, Kotzebue Sound, and North Slope. Open to both speakers and non-speakers. For speakers the course provides literacy and grammatical analysis. For others it provides a framework for learning to speak, read and write the language. Consideration given to dialect differences. ***Prerequisites: ESK F111.*** (5+0)

ESK F115 **Conversational Inupiaq**
1-3 Credits Offered as Demand Warrants
Introductory course for students who wish to acquire the ability to speak Inupiaq, the language of Norton Sound, the Seward Peninsula, Kotzebue Sound, the North Slope, and the arctic portions of Canada and Greenland. Students first learn to understand simple spoken language, then to speak simple Inupiaq, developing a beginning level of communicative competence in the language. Graded Pass/Fail. (1-3+0)

ESK F116 **Conversational Inupiaq**
1-3 Credits Offered as Demand Warrants
Introductory course for students who wish to acquire the ability to speak Inupiaq, the language of Norton Sound, the Seward Peninsula, Kotzebue Sound, the North Slope, and the arctic portions of Canada and Greenland. Students first learn to understand simple spoken language, then to speak simple Inupiaq, developing a beginning level of communicative competence in the language. ***Prerequisites: ESK F115.*** (1-3+0)

ESK F118 **Inupiaq Orthography**
3 Credits Offered as Demand Warrants
Entry-level course designed for students who are fluent in Inupiaq. Reading silently and aloud, and writing. Emphasis on specific skills and practical application of skills through writing assignments. ***Prerequisites: Demonstrated conversational Inupiaq skills.*** (3+0)

ESK F121 **Elementary Central Yup'ik Apprenticeship I**
4 Credits Offered as Demand Warrants
Entry-level course to learn to speak/understand Yup'ik Eskimo. Local speaker acts as language mentor/primary resource. Focus on everyday situations. Yup'ik faculty member serves as instructor of record. Student and mentor required to participate in 10 hr orientation, maintain weekly contact with instructor of record, and participate in monthly assessment. Kuskokwim campus only. ***Special Conditions: Dependent on ability to identify willing mentor who meets Yup'ik faculty approval.*** (1+10)

ESK F122 **Elementary Central Yup'ik Apprenticeship II**
4 Credits Offered as Demand Warrants
Continuation of ESK F121. Increasing emphasis on listening and speaking skills. Kuskokwim campus only. ***Prerequisites: ESK F121 or formal assessment indicating equivalent speaking and listening skills. Special Conditions: Dependent on ability to identify willing mentor who meets Yup'ik faculty approval.*** (1+10)

ESK F123 **Elementary Central Yup'ik Apprenticeship III**
4 Credits Offered as Demand Warrants
Continuation of ESK F122. Increasing emphasis on listening and speaking skills. Kuskokwim campus only. ***Prerequisites: ESK F122 or formal assessment indicating equivalent speaking and listening skills. Special Conditions: Dependent on ability to identify willing Mentor who meets Yup'ik faculty approval.*** (1+10)

ESK F130 **Beginning Yup'ik Grammar** (h)
3 Credits Offered Spring
Literacy and grammatical analysis of Central Yup'ik language for language learners. Students will learn basic grammatical concepts and literacy skills, with consideration given to dialect differences. ***Prerequisites: ESK F103 or ESK F122 or basic conversational Yup'ik skills.*** (3+0)

ESK F155 **Conversational Siberian Yup'ik**
1-3 Credits Offered as Demand Warrants
Introductory courses for students who wish to acquire the ability to speak in Siberian Yupik, the language of St. Lawrence Island and parts of the Chukchi Peninsula in Siberia. Students first learn to understand simple spoken language, then to speak simple Siberian Yupik, developing a beginning level of communicative competence in the language. Northwest Campus only. (1-3+0)

ESK F156 **Conversational Siberian Yup'ik**
1-3 Credits Offered as Demand Warrants
Introductory courses for students who wish to acquire the ability to speak in Siberian Yupik, the language of St. Lawrence Island and parts of the Chukchi Peninsula in Siberia. Students first learn to understand simple spoken language, then to speak simple Siberian Yupik, developing a beginning level of communicative competence in the language. Northwest Campus only. (1-3+0)

ESK F158 **Siberian Yupik Orthography**
1-3 Credits Offered as Demand Warrants
Introduction to the standard writing system (orthography) of Siberian Yupik. Students learn the skills of spelling, reading and writing words in Siberian Yupik, which are the fundamentals of basic literacy. Northwest Campus only. ***Prerequisites: Ability to speak Siberian Yupik or permission of instructor.*** (1-3+0)

ESK F201 **Intermediate Central Yup'ik** (h)
3 Credits Offered Fall
Continuation of ESK F101 and ESK F102. Increasing emphasis on speaking, reading and writing. ***Prerequisites: ESK F102 or permission of instructor.*** (3+0)

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ESK F202 **Intermediate Central Yup'ik** (h)
3 Credits Offered Spring
Continuation of ESK F101 and ESK F102. Increasing emphasis on speaking, reading and writing. ***Prerequisites: ESK F102 or permission of instructor.*** (3+0)

ESK F203 **Conversational Central Yup'ik III** (h)
3 Credits Offered Fall
A continuation of ESK F103 and ESK F104. Kuskokwim campus only. ***Prerequisites: ESK F104 or permission of instructor.*** (3+0)

ESK F204 **Conversational Central Yup'ik IV** (h)
3 Credits Offered Spring
Continuation of ESK F203. Development of proficiency in the Central Yup'ik language, vocabulary for everyday situations, reading and writing. (3+0)

ESK F205 **Regaining Fluency in Yup'ik** (h)
3 Credits Offered Fall
Yup'ik speaking skills and fluency for those with some background in the language. ***Prerequisites: Permission of instructor. Each potential student must be evaluated for language capabilities.*** (3+0)

ESK F206 **Regaining Fluency in Yup'ik II** (h)
3 Credits Offered Spring
Continuation of ESK F205. Speaking skills and fluency for those with some background in the language. ***Prerequisites: ESK F205 or permission of instructor. Each potential student must be evaluated for language capabilities.*** (3+0)

ESK F208 **Yup'ik Composition** (h)
3 Credits Offered Spring
An examination of the development of written Yup'ik and exploration of writing for entertainment, information, transcription of oral narratives and note taking in meetings where Yup'ik is the dominant language. New writing styles are examined, rather than simply translating the standard categories of English composition. Students receive extensive practice in Yup'ik orthography and participate in the evaluation of each other's writings. ***Prerequisites: ESK F109.*** (3+0)

ESK F211 **Intermediate Inupiaq Eskimo** (h)
3 Credits Offered Fall
Continuation of ESK F111 and ESK F112, concentrating on development of conversational ability, with presentation of additional grammar and vocabulary. ***Prerequisites: ESK F112.*** (3+0)

ESK F212 **Intermediate Inupiaq Eskimo** (h)
3 Credits Offered Spring
Continuation of ESK F211, concentrating on development of conversational ability, with presentation of additional grammar and vocabulary. ***Prerequisites: ESK F211.*** (3+0)

ESK F218 **Inupiaq Composition**
3 Credits Offered as Demand Warrants
An examination of the development of written Inupiaq uses to entertain, inform, persuade, transcribe oral narratives and take notes on such occasions as city council meetings. Open to new genres, rather than simply translating the standard categories of English composition. Students receive extensive practice in the Inupiaq orthography and actively participate in evaluation of each other's writing ***Prerequisites: ESK F118 or equivalent.*** (3+0)

ESK F221 **Intermediate Central Yup'ik Apprenticeship I**
3 Credits Offered as Demand Warrants
Intermediate-level learning to speak and understand Yup'ik. Local speaker acts as mentor/primary resource. Focus on everyday situations. Yup'ik faculty member serves as instructor of record. Student and mentor required to participate in ten hour orientation, maintain weekly contact with instructor of record, and participate in monthly assessment. Kuskokwim campus only. ***Prerequisites: ESK F123 or formal assessment indicating equivalent speaking and listening skills. Special Conditions: Dependent on ability to identify willing mentor who meets Yup'ik faculty approval.*** (1+10)

ESK F222 **Intermediate Central Yup'ik Apprenticeship II**
3 Credits Offered as Demand Warrants
Continuation of ESK F221. Increasing emphasis on listening and speaking skills. Dependent on ability to identify willing mentor who meets Yup'ik faculty approval. Kuskokwim campus only. ***Prerequisites: ESK F221 or formal assessment indicating equivalent speaking and listening skills.*** (1+10)

ESK F223 **Intermediate Central Yup'ik Apprenticeship III**
3 Credits Offered as Demand Warrants
Continuation of ESK F222. Increasing emphasis on listening and speaking skills. Dependent on ability to identify willing mentor who meets Yup'ik faculty approval. Kuskokwim campus only. ***Prerequisites: ESK F222 or formal assessment indicating equivalent speaking and listening skills.*** (1+10)

ESK F230 **Introduction to Interpreting and Translating I** (h)
3 Credits Offered as Demand Warrants
Introduction to interpreting and translating, designed for both those wishing to enter the field and those who wish to upgrade their skills. Discussion of problems which arise during interpreting and translating along with suggestions on how to handle them. ***Prerequisites: Must be fluent in English and Yup'ik; permission of instructor.*** (3+0)

ESK F231 **Introduction to Interpreting and Translating II** (h)
3 Credits Offered as Demand Warrants
Continuation of ESK F230. ***Prerequisites: ESK F230.*** (3+0)

ESK F240 **Introduction to Reading and Writing Yup'ik**
3 Credits Offered Fall Odd-numbered Years
Emphasis on reading and writing Yup'ik for practical purposes (posters, brochures, pamphlets, newsletters, signs) and continued language learning (short stories, descriptions and narratives). ***Prerequisites: ESK F130; ESK F204 or ESK F222.*** (3+0)

ESK F250 **Yup'ik Literature for Children**
3 Credits Offered as Demand Warrants
Students explore and practice reading children's literature in Yup'ik. Students are exposed to a variety of genres (fiction, nonfiction, traditional stories, poetry, songs, etc.). Reader leveling will be discussed. Students are required to write targeted readers for specific reading levels in Yup'ik. Kuskokwim campus only. ***Prerequisites: ESK F208 or equivalent reading and writing skills.*** (3+0)

ESK F251 **Teaching Beginning Yup'ik Reading and Writing**
3 Credits Offered as Demand Warrants
Teaching strategies in Yup'ik literacy. Focus on reading and writing at the primary-early entry through intermediate levels. Students develop lessons for reading, writing and word study, manage instructional time, and use assessment for placement and instructional purposes. Materials, reading resources, and instructional guides will be reviewed and used for the development of lessons. Kuskokwim campus only. ***Prerequisites: ESK F208 or equivalent reading and writing skills.*** (3+0)

ESK F260 **Siberian Yupik Eskimo** (h)
3 Credits Offered as Demand Warrants
A course in Eskimo language of St. Lawrence Island and the opposing area of Chukotka in Russia. Concentration on literacy and grammar with background given for conversation. Open to speakers of the language and to others if they have taken one or more years of Central Yup'ik or Inupiaq courses. ***Prerequisites: Ability to speak Siberian Yupik or one year study of other Eskimo language.*** (3+0)

ESK F261 **Siberian Yupik Eskimo** (h)
3 Credits Offered as Demand Warrants
A course in Eskimo language of St. Lawrence Island and the opposing area of Chukotka in Russia; concentration on literacy and grammar (with background given for conversation); open to speakers of the language and to others if they have taken one or more years of Central Yup'ik or Inupiaq courses. ***Prerequisites: Ability to speak Siberian Yupik or one year study of other Eskimo language.*** (3+0)

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ESK F301 **Advanced Central Yup'ik Eskimo** (h)
3 Credits Offered Fall
Continuation of ESK F201 and F202. Completes the basic study of the Central Yup'ik grammar. ***Prerequisites: ESK F101; ESK F102; ESK F201; ESK F202; or permission of instructor.*** (3+0)

ESK F330 W **Yup'ik Literature/Yupiit Quliraitnek Igaryaraq** (h)
3 Credits Offered Fall Even-numbered Years
Central Yup'ik literature with exposure to a variety of literary styles, including qulirat, qaneryaraqegtaaraat, ak'allaat qulirat, qanruyutet/ alerquutet. Broad range of regional, stylistic and orthographic traditions through a variety of short papers and a final paper/project. Specific content to be announced at time of registration. Taught entirely in Yup'ik. Kuskokwim campus only. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; ESK F208; ESK F240.*** (3+0)

ESK F375 O **Yup'ik Philosophy/Umyuarteqsaraq** (h)
3 Credits Offered Fall Even-numbered Years
Exploration of Yup'ik philosophy and spirituality, including exploration of the relationship between modern and traditional belief systems and the influence of western religion and philosophy. Taught entirely in Yup'ik. Kuskokwim campus only. ***Prerequisites: COMM F131X or COMM F141X; ESK F240.*** (3+0)

ESK F415 **Additional Topics in Advanced Yup'ik Eskimo** (h)
3 Credits Offered Spring
Further study of Yup'ik linguistics. Includes text transcription, editing, analysis and discussion. Yup'ik dialectology. Study of related Eskimo languages from the standpoint of Central Yup'ik. Additional topics to be studied depending upon the interests of the students and the instructor. ***Prerequisites: ESK F101; ESK F102; ESK F201; ESK F202; or permission of instructor.*** (3+0)

ESK F417 **Advanced Inupiaq Eskimo** (h)
3 Credits Offered Spring
Advanced study in Inupiaq Eskimo. Continuation of ESK F212. ***Prerequisites: ESK F111; ESK F112; ESK F211; ESK F212; or permission of instructor.*** (3+0)

ESK F488 W **Documenting Yup'ik Traditions/Caliarkaq** (h)
3 Credits Offered Fall Even-numbered Years
Major research project relating to Yup'ik language and culture (e.g. traditional narratives, personal/local histories, local customs/beliefs). Project formats include (but are not limited to) research papers, video/audiotapes, curricula and public presentations. Note: As a writing intensive course, all formats will include a significant written component. Taught entirely in Yu'pik. Kuskokwim campus only. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; ESK F330; senior standing; or permission of instructor.*** (3+0)

ETHNOBOTANY

EBOT F100 **Introduction to Ethnobotany**
3 Credits
Basic concepts of botany and ethnobotany, with emphasis on the native flora of Alaska and how people use these plants. Basic plant biology and taxonomy; scientific methods of plant collection, including identification and curation; use of native Alaska plants for food and medicines; ethnobotanical methods of collecting plant-use information from indigenous cultures and ways that this information contributes to other fields of study, such as resource management, community development, and human health. (2+3)

EBOT F200 **Seminar in Ethnobotany**
1 Credit Offered Spring Odd-numbered Years.
Surveys basic concepts of ethnobotany and ethnoecology, with emphasis on how people use plants, the role of plants in traditional food systems, and the dynamics of human-plant -ecosystem interactions in a context of rapid social, ecological and climatic change. Lectures and discussion focus specifically on plant use in Alaska and other high latitude geographic and ecological settings, but ethnobotanical research in mid latitude and tropical settings will be referenced where appropriate. Students will gain a basic understanding of plant biology and taxonomy; plants and ecosystem services; the use of native Alaska plants for food and medicines; the economics of innovative plant-based businesses; and the cultural and economic significance of plant use to other cultures worldwide. ***Prerequisites: EBOT F100; or permission of instructor.*** (1+0)

EBOT F210 **Ethical Wildcrafting**
1 Credit Offered Fall
Provides an understanding of the industry of wildcrafting: the gathering, harvesting, processing and in some cases, marketing of nontimber forest products. Specific examples from Alaska will be used to illustrate all aspects of this course, from identification of native flora, to a conceptualization of the unique market niche that Alaskan natural products fill, to native plant propagation and effects of invasive plants. ***Prerequisites: EBOT F100; or permission of instructor*** (1+0)

EBOT F220 **Ethnobotanical Techniques**
2 Credits Offered Spring
Provides required skills for conducting field investigations into the human use of plants. Focuses on interviewing elders about native plant use and methods for conducting structured and non-structured interviews, plant collection, participant observation and data analysis. Ethical issues in ethnobotany, e.g., intellectual property rights, benefit-sharing and conservation of native plants. ***Prerequisites: EBOT F100; EBOT F200.*** (1.5+0+1.5)

EBOT F230 **Ethnobotanical Chemistry**
3 Credits Offered Fall
Basic understanding of chemical structure and function of medicinally active plant compounds. How and why plants produce primary and secondary compounds, how humans use these compounds and methods used to isolate and deliver plant-derived compounds. How drugs are derived from plants and the ethics of bioprospecting. Medicinal flora of Alaska from a chemical perspective. ***Prerequisites: EBOT F100; CHEM F103X or CHEM F105X.*** (3+0)

FILM STUDIES

FLM F105 **History of the Cinema** (h)
3 Credits
History and development of the medium of film in the U.S. and abroad during the last 100 years. Content will vary each semester. Note: Available via Independent Learning only. Cross-listed with JRN F105. (3+0)

FLM F215 **Dramatic Literature** (h)
3 Credits Offered Fall Even-numbered Years
Studies of drama and forms of plays such as tragedy, comedy, melodrama, farce and tragicomedy. Emphasis on reading plays of the classic theatre designed to give basic knowledge of masterpieces of world drama. Cross-listed with THR F215. (3+0)

FLM F217 **Introduction to the Study of Film** (h)
3 Credits Offered Spring
An appreciation course designed to introduce the student to the various forms of cinematic art with special emphasis on humanistic and artistic aspects. ***Prerequisites: ENGL F111X.*** Cross-listed with ENGL F217; JRN F217. (2+2)

FLM F245 **Stage and Film Production Management** (h)
3 Credits
Define and develop organizational skills to be a successful stage or film production manager. Creation of a prompt script including all forms and schedules necessary, working with actors, directors and designers. Creation of film production schedules, call sheets, shooting scripts, location management, and union requirements. Cross-listed with THR F245. (3+0)

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FLM F251 **Television Production**
4 Credits Offered Fall
Television studio production, floor directing, audio, camera, staging, lighting and switching. Special fees apply. Cross-listed with JRN F251. (2+5)

FLM F271 **Let's Make a Movie!**
3 Credits Offered Fall
Produce a short dramatic video including concept and script development, basic camera and shooting techniques, working with actors/directing fundamentals, location scouting, production schedule development, basic non-linear editing techniques, and DVD authoring. Students do not need previous experience making movies to take this class. Special fees apply. ***Recommended: THR F121; THR F241.*** Cross-listed with THR F271. (3+0)

FLM F280 **Video Storytelling** (h)
3 Credits Offered Fall
Basics of digital video production technology, composition, audio, lighting and editing as it relates to primarily non-fiction filmmaking. Students will conclude the course by producing their own short videos. Special fees apply. Cross-listed with JRN F280. (3+0)

FLM F290 **Digital Video Editing**
3 Credits Offered as Demand Warrants
Introduction to the technical and aesthetic aspects of non-linear digital video editing. Students will go from little or no experience in non-linear editing to being comfortable with some of the advanced editing techniques. Address motion picture editing theories that are not bound to time or specific editing technology. Special fees apply. Cross-listed with JRN F290. (3+0)

FLM F308 **Film Criticism** (h)
3 Credits
Theoretical approaches to viewing, analyzing and evaluating film and television program content. Note: Available via Independent Learning only. Cross-listed with JRN F308. (3+0)

FLM F310 **Acting for the Camera** (h)
3 Credits Offered Fall Even-numbered Years
Apply skills introduced in fundamentals of acting, intermediate and advanced acting to acting for the camera. Through exercises and scene study, the class will expand each performer's range of emotional, intellectual, physical and vocal expressiveness for the camera. Act in numerous on-camera exercises, television and film scenes. May be repeated twice for credit. Special fees apply. ***Prerequisites: THR F121. Recommended: THR F221; THR F321.*** Cross-listed with THR F310. (3+0)

FLM F331 **Directing Film/Video** (h)
3 Credits Offered Spring
Introduction to the history, theory and basic concepts of film direction. Includes interpretative script analysis, creative visualization, conceptualization, use of space, working with actors and designers, and direction of short scenes and videos. Special fees apply. ***Prerequisites: THR F121; FLM/THR F215; or permission of instructor.*** Cross-listed with THR F331. (1+4)

FLM F332 **Directing Theatre** (h)
3 Credits Offered Spring
History, theory and basic concepts of stage direction. Interpretive script analysis, creative visualization, conceptualization, use of space, working with actors and designers and direction of short scenes. ***Recommended: THR F121.*** Cross-listed with THR F332. (3+0)

FLM F334 W **Movies and Films: Watching and Analyzing** (h)
3 Credits Offered Spring
Thematic topics in the study of the art of classic cinema (films) and popular mass media (movies). Comparative analysis of classics and recent motion pictures is used to present elements of film language, analysis and criticism in this writing intensive course. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** Cross-listed with THR F334. (3+0)

FLM F347 O **Lighting Design** (h)
3 Credits
Principles and techniques of theatrical lighting design. The student will conduct practical experiments and design projects applying the experience gained from the experiments. Students will spend approximately $40 for materials. Also available through the Center for Distance Education. ***Prerequisites: COMM F131X or COMM F141X. Recommended: THR F241; THR F247.*** Cross-listed with ART F347; JRN F347; THR F347. (3+0)

FLM F348 **Sound Design for the Entertainment Industry** (h)
3 Credits Offered Spring Odd-numbered Years
Exploration and application of the elements of design as they relate to sound for theatre, dance, film, video, and other art forms, and life in American and other cultures. Production work is required. Special fees apply. ***Recommended: THR F241; THR F247.*** Cross-listed with THR F348. (2+2)

FLM F371 O **Digital Photography and Pixel Painting**
3 Credits
An introduction to the world of digital imaging with applications in fine and commercial art. It is expected that students will become competent at creating real-looking images of impossible subjects as well as detecting their creation by others. The varied ethical issues engendered by this expertise will be addressed in depth. Students will be required to gain proficiency in visual design for electronic and print publication. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; Macintosh OS or Windows OS experience with graphic applications; one college level studio art course.*** Cross-listed with ART F371; JRN F371. (1+4)

FLM F381 W **Alaska Natives in Film** (h)
3 Credits Offered Spring Odd-numbered Years
Analysis of the portrayal of Alaska's Inupiaq and Yup'ik peoples (with some on Canada's Inuit) through select films and readings. Learning to critically analyze films and understanding how various film techniques are accomplished while focusing on feature films' treatment and use of Northern peoples in film, as well as looking at the social impact of such films. Also available through the Center for Distance Education. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor. Recommended: ART/MUS/THR F200X.*** Cross-listed with ANS F381. (1.5+2-4)

FLM F427 **Topics in Film Studies** (h)
3 Credits Offered Spring
Intensive study of variable topics in film studies. May focus on themes such as race or war in film; a specific period such as films of the 1940's: particular genres such as horror, film noir, or the musical, an important director, or an aspect of contemporary film theory. Intensive readings and research in contemporary film theory and criticism will foster in-depth understanding of chosen topic. Course may be repeated two times for credit when content varies. ***Prerequisites: ENGL F217 or FLM F217; ENGL F211X or ENGL F213X; or permission of instructor.*** Cross-listed with ENGL F427. (2+2)

FLM F470 **Advanced Film and Video Directing** (h)
3 Credits Offered Fall Even-numbered Years
In depth investigation into the history, theory and basic concepts of film and video direction. Script preparation, story board, blocking actors and staging the camera, sound and editing. Projects include directing and shooting short videos. Special fees apply. ***Recommended: FLM/THR F331.*** Cross-listed with THR F470. (1+6)

FLM F472 O **Visualization and Animation** (h)
3 Credits Offered Fall
An introduction to visualization and animation with applications in fine and commercial art and science. Students will produce a series of three dimensional animation projects which will introduce them to the tools and concepts used by animation and visualization professionals. Note: May be repeated for credit. Special fees apply. ***Prerequisites: ART F371 or equivalent; COMM F131X or COMM F141X.*** Cross-listed with ART F472; JRN F472. (1+4)

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FLM F475 **Digital Video Compositing** (h)
3 Credits Offered as Demand Warrants
Digital compositing techniques for creating moving imagery. The course covers video manipulation, layering images, synthesizing realistic video imagery, integration of live action and computer generated animation. Course can be repeated for a total of nine credits with permission of instructor. ***Prerequisites: ART F472 or JRN F472 or FLM F472 or equivalent.*** Cross-listed with ART F475. (1+4)

FLM F480 **Documentary Filmmaking** (h)
3 Credits Offered Spring
Basics of hands-on documentary filmmaking techniques, including preproduction, production and postproduction. Different documentary filmmaking directing styles and the process of distributing a documentary. Each student will produce a short documentary as the capstone of the course. Special fees apply. ***Basic experience in shooting and editing video or permission of instructor.*** Cross-listed with: JRN F480. (3+0)

FLM F488 W **Dramatic Writing** (h)
3 Credits Offered Even Alternate Fall
Introduction to the craft of dramatic writing for theater and film, with an emphasis on dramatic storytelling. Course will focus on giving students a practical understanding of the uses of story structure, setting, character, plot and dialog, and how these elements work together to create compelling drama. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** Cross-listed with ENGL F488; THR F488. (3+0)

FIRE SCIENCE

FIRE F101 **Principles of Emergency Services**
3 Credits Offered Fall
Overview of fire protection, career opportunities in fire protection and related fields, philosophy and history of fire protection/service. Fire loss analysis, organization and function of public and private protection services. Fire departments as part of local government, laws and regulations affecting fire services, fire service nomenclature, specific fire protection functions. Basic fire chemistry and physics, introduction to fire protection systems and introduction to fire strategy and tactics. (3+0)

FIRE F105 **Fire Prevention**
3 Credits Offered Fall
The history and philosophy of fire prevention, organization and operation of a fire prevention bureau. Use of fire codes, identification and correction of fire hazards, and the relationships of fire prevention with built-in fire protection systems, fire investigation, and fire and life-safety education. ***Prerequisites: FIRE F101 or permission of instructor.*** (3+0)

FIRE F107 **Strategy and Tactics**
3 Credits Offered Spring
The principles of fire control through utilization of personnel, equipment and extinguishing agents on the fire ground. ***Prerequisites: FIRE F101 or permission of instructor.*** (3+0)

FIRE F110 **Introduction to Hazardous Waste Operations and Emergency Response**
3 Credits Offered as Demand Warrants
Review of federal and state hazardous materials laws and regulations. Career opportunities related to the field of hazardous materials including transportation, emergency response, site clean up and Incident Command System (ICS). (3+0)

FIRE F115 **Fire Apparatus and Equipment**
3 Credits Offered Spring Even-numbered Years
Fire apparatus design, specifications and performance capabilities, effective use of apparatus in fire emergencies. ***Prerequisites: FIRE F101 or permission of instructor.*** (3+0)

FIRE F117 **Rescue Practices**
3 Credits Offered Spring
Rescue situations and techniques including vehicle extrication, rescue carries, ventilation principles, structural rescue, use of portable hand and power tools, wildland/canine search and rescue, ice and water rescue and emergency life saving principles. Also Offered Pass/Fail as FIRE F117P. Special fees apply. ***Prerequisites: EMS F170, or permission of instructor. All students are required to wear a complete set of fire department-approved protective clothing (turnout gear). Limited quantities are available for loan through the emergency services program coordinator. An eight-hour personal protective equipment and self-contained breathing apparatus safety orientation must be completed in order to participate in live fire exercises.*** (3+0)

FIRE F121 **Fire Behavior and Combustion**
3 Credits Offered Fall
Theories and fundamentals of how and why fires start, spread, and how they are controlled. (3+0)

FIRE F123 **Fire Investigations I**
3 Credits Offered Spring Odd-numbered Years
Fundamentals and technical knowledge needed for proper fire scene interpretations, including recognizing and conducting origin and cause, preservation of evidence and documentation, scene security, motives of the firesetter and types of fire causes. ***Prerequisites: FIRE F101 or permission of instructor.*** (3+0)

FIRE F127 **Vessel Safety: Emergency Equipment, Procedures and Drills**
1 Credit Offered Fall
Introduction to safe boating practices and skills including boat handling, rules of navigation, proper safety equipment, weather, boat trailering, lines and knots, first aid and emergency procedures. Graded Pass/Fail. (1+0)

FIRE F131 **Firefighter I, Series I**
3 Credits Offered Spring, As Demand Warrants
The initial phase in a four-phase process for achieving State of Alaska Fire Fighter I certification. Fundamental knowledge of fire behavior, fire organizations, types of fire equipment emergency response services possess and methods of their use. Successful completion of all four phases will qualify the student for Alaska State Fire Fighter I certification. Special fees apply. ***Prerequisites: All students are required to wear a complete set of fire department approved protective clothing (turnout gear). Limited quantities are available for loan through the Emergency Services Program coordinator.*** (3+0)

FIRE F133 **Firefighter I, Series II**
3 Credits Offered Fall, As Demand Warrants
The second phase in a four-phase process for achieving State of Alaska Fire Fighter I certification. Fundamental knowledge of fire behavior, fire organizations, types of fire equipment emergency response services possess and methods of their use. Successful completion of all four phases will qualify the student for Alaska State Fire Fighter I certification. Special fees apply. ***Prerequisites: All students are required to wear a complete set of fire department approved protective clothing (turnout gear). Limited quantities are available for loan through the emergency services program coordinator. An 8 hour Personal Protective equipment (PPE) and Self-Contained Breathing Apparatus (SCBA) safety orientation offered each semester must be completed in order to participate in live fire exercises.*** (2+2)

FIRE F135 **Firefighter I, Series III**
3 Credits Offered Fall, As Demand Warrants
The third phase in a four-phase process for achieving State of Alaska Fire Fighter I certification. Fundamental knowledge of fire behavior, fire organizations, types of fire equipment emergency response services possess and methods of their use. Successful completion of all four phases will qualify the student for Alaska State Fire Fighter I certification. Special fees apply. ***Prerequisites: All students are required to wear a complete set of fire department approved protective clothing (turnout gear). Limited quantities are available for loan through the Emergency Services program coordinator. An 8 hour Personal Protective equipment (PPE) and Self-Contained Breathing Apparatus***

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(SCBA) safety orientation is offered each semester and must be completed in order to participate in live fire exercises. (2+2)

FIRE F137 Firefighter I, Series IV
3 Credits Offered Spring, As Demand Warrants
The final phase in a four-phase process for achieving State of Alaska Fire Fighter I certification. Fundamental knowledge of fire behavior, fire organizations, types of fire equipment emergency response services possess and methods of their use. Successful completion of all four phases will qualify the student for Alaska State Fire Fighter I certification. Special fees apply. (3+0)

FIRE F143 Firefighter Internship, Series 1
1 Credit Offered Fall
Practical experience in fire operations and training by arrangement through local fire departments. Graded Pass/Fail. (0+2)

FIRE F145 Firefighter Internship, Series 2
1 Credit Offered Spring, As Demand Warrants
Practical experience in fire operations and training by arrangement through local fire departments. Graded Pass/Fail. *Prerequisites: FIRE F143.* (0+2)

FIRE F147 Firefighter Internship, Series 3
1 Credit Offered Spring, As Demand Warrants
Practical experience in fire operations and training by arrangement through local fire departments. *Prerequisites: FIRE F145.* (0+2)

FIRE F151 Wildland Fire Control I
3 Credits Offered Spring
Designed to provide national certification for entry-level and experienced fire fighters with fundamental knowledge of wildland fire organization, fire behavior, air operations, suppression methods, safety and the incident command system. Successful course completion combined with national age and physical fitness requirements will qualify the student for an interagency fire qualification card (red card) with a rating of Firefighter (FFT2). (3+0)

FIRE F153 Advanced Wildland Firefighter
3 Credits Offered Fall
Designed to provide national certification for advanced wildland firefighters with knowledge of water use, preliminary fire investigation and the duties and responsibilities of the squad boss. *Prerequisites: FIRE F151 or instructor permission.* (2.5+1)

FIRE F155 Wildland Fire Behavior
3 Credits Offered Spring Odd-numbered Years
Fire behavior knowledge necessary to determine basic input data for fire behavior calculations such as rate of spread, fire line intensity, flame length and area/perimeter growth using fire behavior prediction systems. Prepare fire perimeter maps, assess and predict chances of extreme fire behavior conditions, assess fire line data and fire behavior estimations, identify fire suppression limitations, and make recommendations for fire line location and safe control tactics. *Prerequisites: FIRE F151 or permission of instructor.* (3+0)

FIRE F157 Wildland Air Operations and Safety
3 Credits Offered Fall Odd-numbered Years
Basic use of aircraft in wildland fire operations including helicopter operations, types and capacities, helibase/helispot construction, logistics support and specialized missions. Fixed wing operations include establishment of air bases, retardant operations, aircraft fueling and paracargo support. Emphasis on aviation safety. *Prerequisites: FIRE F151 or permission of instructor.* (3+0)

FIRE F159 Wildland Fire Operations Function
3 Credits Offered Fall Odd-numbered Years
Overview of the operations function including organization; implementation of the incident action plan; tactical use of crews, engines and bulldozers; appointment of supervisors in accordance with span of control; use of fixed wing and rotor wing aircraft and fire operations in the urban interface. Functional position of single resource boss/crew covered. *Prerequisites: FIRE F151; FIRE F153; FIRE F155; FIRE F157; FIRE F254; or permission of instructor.* (3+0)

FIRE F161 Wildland Fire Logistics Function
3 Credits Offered Fall Even-numbered Years
Overview of the support and service branches of the logistics function within the incident command system. Emphasis on entry-level positions of ordering manager, receiving and distribution manager, base camp manager, equipment manager and medical unit leader. *Prerequisites: FIRE F151 or permission of instructor.* (3+0)

FIRE F165 Wildland Fire Planning Function
3 Credits Offered Fall Odd-numbered Years
An overview of the planning process, organizational relationships with other functions, use of planning matrix board, check-in and resource status procedures, evaluation, analysis and display of incident information, documentation, demobilization, use of technical specialist and components of an incident action plan. *Prerequisites: FIRE F151 or permission of instructor.* (3+0)

FIRE F202 Fire Protection Hydraulics and Water Supply
3 Credits Offered Spring
Provides a foundation of theoretical knowledge in order to understand the principles of the use of water in fire protection and their application to analyze and solve water supply problems. *Prerequisites: DEVM F060 or placement into DEVM F105; FIRE F101;or permission of instructor.* (3+0)

FIRE F203 Hazardous Materials Chemistry I
3 Credits Offered Fall
Basic fire chemistry relating to most categories of hazardous materials including problems of recognition, reactivity and health risks encountered by fire fighters. *Prerequisites: Satisfactory demonstration of basic chemistry knowledge (pretest) or permission of instructor.* (3+0)

FIRE F205 Hazardous Materials Chemistry II
3 Credits Offered Spring Odd-numbered Years
Chemistry review of common hazardous materials. Control, confinement and containment operations with an emphasis on decontamination procedures. Basic incident command system instruction. Meets requirements of the operations level, first responder to hazardous materials incidents. *Prerequisites: FIRE F203 or permission of instructor.* (3+0)

FIRE F206 Building Construction for Fire Protection
3 Credits Offered Spring
The components of building construction that relate to fire and life safety. Focuses on fire fighter safety. Includes elements of construction and design of structures shown to be key factors when inspecting buildings, preplanning fire operations and operating emergencies. *Prerequisites: FIRE F101 or employment or experience in related field, such as fire protection, insurance, construction architecture, or engineering.* (3+0)

FIRE F207 Hazardous Materials Technician
3 Credits Offered as Demand Warrants
Advanced information for protection and safety of personnel engaged in response and field cleanup of hazardous materials and substances at the hazardous materials technician level (EPA course #165.15). Special fees apply. *Prerequisites: FIRE 205 or permission of instructor.* (3+0)

FIRE F209 Hazardous Materials Command/Safety Officer
3 Credits Offered as Demand Warrants
Preparation for Incident Commander and the Safety Officer positions on complex hazardous materials incidents or large site cleanup operations. *Prerequisites: FIRE F207 or permission of instructor.* (3+0)

FIRE F210 Fire Administration I
3 Credits Offered Fall
Organization and management of a fire department and the relationship of government agencies to the fire service. Emphasis on fire service leadership from the perspective of the company officer. *Prerequisites: FIRE F101 or permission of instructor.* (3+1)

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FIRE F212 **Building and Fire Codes**
3 Credits Offered Spring Even-numbered Years
Introduction to life safety aspects of the uniform building code. Emphasis on uniform fire code for fire inspections on existing buildings, flammable liquids, hazardous materials and special processes. Preparation for the uniform fire code exam administered by the International Conference of Building Officials. ***Prerequisites: FIRE F101; FIRE F206; or permission of instructor.*** (3+0)

FIRE F214 **Fire Protection Systems**
3 Credits Offered Fall
Features of design and operation of fire detection and alarm systems, heat and smoke control systems, special protection and sprinkler systems, water supply for fire protection and portable fire extinguishers. ***Prerequisites: FIRE F101 or permission of instructor.*** (3+0)

FIRE F215 **Advanced Hazardous Materials Technician**
3 Credits Offered as Demand Warrants
Provides increased hands-on skills for personnel with a hazardous materials technician rating. Emphasis will be placed on task proficiency in spill containment, plugging, patching, diking and valve shut-offs on large commercial transporters. Stabilization of large and small chlorine leaks and decontamination will also be covered. Special fees apply. ***Prerequisites: FIRE F207 or permission of instructor.*** (2+2)

FIRE F216 **Methods of Instruction for Emergency Services Training**
3 Credits Offered Spring Odd-numbered Years
Skills necessary to instruct emergency service courses including adult education techniques, classroom setup, use of audiovisual equipment, presentation, and evaluation methods of students and instruction. (3+0)

FIRE F217 **Hazardous Materials Technician Refresher**
1 Credit Offered as Demand Warrants
Information and skills required for protection and safety of personnel engaged in response and field cleanup of hazardous materials and substances at the hazardous materials technician level. Special fees apply. ***Prerequisites: FIRE F206 or equivalent with certification that may not be expired for more than one calendar year.*** (1+0)

FIRE F218 **Advanced Rescue Practices**
3 Credits Offered Fall
Provides instruction in four of the most common rescue situations that fire departments encounter in an Interior Alaska rescue: vehicular extrication, rope rescue, confined space rescue and ice/water rescue. Class stresses basic knowledge and hands-on experience. All students are required to wear a complete set of fire department-approved protective clothing (turnout gear). Limited quantities are available for loan through the Emergency Services Program Coordinator. Special fees apply. ***Prerequisites: EMS F170; FIRE F117; or permission of instructor.*** (3+0)

FIRE F219 **Rapid Intervention Company Operations**
3 Credits Offered as Demand Warrants
Provides firefighters with the knowledge and skills necessary to work safely and respond appropriately to life-threatening situations. Includes rapid intervention team building skills, self rescue techniques and the knowledge to handle a mayday or high risk/threat situation. Completion of course will qualify students for the state of Alaska certification testing process. All students are required to wear full firefighter personal protective equipment. Limited quantities of PPE are available for loan through the program coordinator. ***Prerequisites: FIRE F117, FIRE F131, FIRE F133, FIRE F135 and FIRE F137; or department head approval.*** (2.5+1)

FIRE F231 **Hazardous Materials Tactical Operations**
3 Credits Offered as Demand Warrants
Tactical operations involving hazardous materials at fixed facilities as well as transportation incidents involving flammable and combustible liquids, corrosives, poisons, cryogenics, oxidizers, LPG, etiological materials, etc. ***Prerequisites: FIRE F207 or permission of instructor.*** (3+0)

FIRE F232 **Fire Fighter II**
3 Credits Offered Summer, As Demand Warrants
Advanced technical study of fire alarms, communications, fire behavior, self-contained breathing apparatus, rescue, safety, ladders, fire hose, nozzles and appliances, fire streams, water supplies, sprinklers, overhaul and inspections. All students are required to wear a complete set of fire department approved protective clothing (turnout gear). Limited quantities are available for loan through the emergency services program coordinator. Special fees apply. ***Prerequisites: FIRE F131; FIRE F133; FIRE F135; FIRE F137; or permission of instructor. Note: An eight-hour personal protective equipment and self-contained breathing apparatus safety orientation must be completed in order to participate in live fire exercises.*** (2+2)

FIRE F244 **Firefighter Internship, Series 4**
1 Credit Offered Fall
Practical experience in fire operations and training by arrangement through local fire departments. ***Prerequisites: FIRE F145 or FIRE F147.*** (0+2)

FIRE F246 **Firefighter Internship, Series 5**
1 Credit Offered Spring
Practical experience in fire operations and training by arrangement through local fire departments. ***Prerequisites: FIRE F244.*** (0+2)

FIRE F248 **Firefighter Internship, Series 6**
1 Credit Offered Summer, As Demand Warrants
Practical experience in fire operations and training by arrangement through local fire departments. ***Prerequisites: FIRE F246.*** (0+2)

FIRE F249 **Computer Aided Management of Emergency Operations**
3 Credits Offered as Demand Warrants
Assistance to emergency planners and first responders to plan for and safely handle chemical accidents through use of a computer. CAMEO contains chemical nomenclature and response information for 3,311 commonly transported chemicals. (2.5+1)

FIRE F252 **Wildland Fire Prevention**
3 Credits Offered Spring Even-numbered Years
Overview of wildland fire prevention including data collection, problem identification, problem analysis, action planning, fire reporting, fire cause determination, enforcement of laws and ordinances, public fire education, and the economics of fire prevention. ***Prerequisites: FIRE F151; FIRE F153; or permission of instructor.*** (3+0)

FIRE F254 **Wildland Fire Finance Function**
3 Credits Offered Fall
Fire business management objectives, including duties and responsibilities of a fire finance section relating to management practices and programs. Procedures required in various finance positions including financial management of a large complex wildland fire. ***Prerequisites: FIRE F151; FIRE F153; or permission of instructor.*** (3+0)

FIRE F256 **Wildland Fire Planning and Multiple Use Management**
3 Credits Offered Fall Odd-numbered Years
Fire management and its role in a multiple use resource program. Includes prescribed and wildfire practices, environmental concerns, management goals and objectives, and pre-fire planning. ***Prerequisites: FIRE F151; FIRE F153; FIRE F155; or permission of instructor.*** (3+0)

FIRE F258 **Wildland Fuels Management**
3 Credits Offered Spring Even-numbered Years
Use of fire as a resource management tool. Natural and prescribed fire planning. Development and procedures to meet management objectives, components for conducting safe, prescribed burning. ***Prerequisites: FIRE F151; FIRE F153; FIRE F155; FIRE F158; FIRE F262; or permission of instructor.*** (3+0)

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FIRE F262 **Wildland Fire Control II**
3 Credits Offered Fall Even-numbered Years
Instruction in tactical operations of fire line construction. Use of hand crews, heavy equipment, water and engines, firing operations, wildland/urban interface and using combinations of resources. Advanced level course for trained and experienced wildland fire fighters. ***Prerequisites: FIRE F151; FIRE F153; FIRE F155; FIRE F157; FIRE F159; FIRE F254; or permission of instructor.*** (3+0)

FIRE F270 **Wildland Fire Command Function**
3 Credits Offered Spring Odd-numbered Years
An overview of the command function including use of single and unified command, roles and responsibilities of the incident commander and staff, development and implementation of strategic decisions, providing information to the media, and managing the incident from initial attack of small, non-complex fires to larger, more complex initial attack suppression organizations dealing with escape attack situations. ***Prerequisites: FIRE F151; FIRE F153; FIRE F155; FIRE F252; or permission of instructor.*** (3+0)

FIRST YEAR EXPERIENCE

FYE F100 **First Year Seminar**
1 Credit Offered Fall and Spring
An introduction, intended for first-year college students, to a current area of scholarly pursuit by faculty. Learn how faculty pursue scholarship in their discipline. An opportunity for first-year students to connect to one another and a faculty member with similar interests in small group-discussion settings and learn about collegiate life. Topics will vary by instructor. Graded Pass/Fail. (1+0)

FISHERIES

FISH F101 **Introduction to Fisheries**
3 Credits Offered Fall
A survey of the values, habitats, biology, ecology and management of fishes with particular reference to Alaska fisheries and issues. (3+0)

FISH F261 **Introduction to Fisheries Utilization**
3 Credits Offered Spring
Application of harvesting, processing, preservation and marketing of Alaska's rich fisheries resources. Core course requirement for all B.A. students completing a minor in fisheries. Serves as an elective for B.S. fisheries students. Course is offered via videoconference. ***Prerequisites: BIOL F116X or CHEM F105X or permission of instructor.*** (3+0)

FISH F288 **Marine and Freshwater Fishes of Alaska**
3 Credits Offered Spring
Biology of the marine and freshwater fishes of Alaska including their evolutionary relationships, biogeography, life-history, ecology, behavior and importance to people. ***Prerequisites: FISH F101 or permission of instructor.*** Cross-listed with BIOL F288. (3+0)

FISH F290 **Fisheries Internship**
1 Credit
Under the supervision of a fisheries professional, students gain practical, professional experience through employment. Can be repeated up to four times, each for a different type of employment. The primary learning objectives for students are to gain professional experience in fisheries and refine career goals. Graded Pass/Fail. ***Prerequisites: Permission of the Fisheries Experiential Learning Coordinator/instructor; a student internship agreement form turned into the Experiential Learning Coordinator. Recommended: STAT F200X.*** (0+0+1-4)

FISH F315 **Freshwater Fisheries Techniques**
3 Credits Offered Maymester Even-numbered Years
Introduction to laboratory and field sampling methods in aquaculture, limnology, and fisheries biology. Emphasis will be placed on the proper care and use of laboratory equipment and field sampling gears, as well as the development of sampling protocols for collecting representative, non-biased fisheries and aquatic sciences data. Special fees apply. ***Prerequisites: FISH F101; FISH F288; STAT F200X; or permission of instructor.*** (2+3)

FISH F336 **Introduction to Aquaculture**
3 Credits Offered Spring Odd-numbered Years
Contribution of Alaska's aquaculture industries including salmon ocean ranching, shellfish and kelp mariculture, contribute to the world's increasingly important aquaculture production. Survey of worldwide production, introduction to production systems, and familiarization with Alaska systems. Team taught by SFOS specialists and featuring invited lecturers, laboratory demonstrations and field trips. This course is taught in Juneau. ***Prerequisites: BIOL F115X.*** (3+0)

FISH F381 **Biology of Commercially Important Salmonid Fishes**
3 Credits Offered as Demand Warrants
Biology, life history and ecology of economically valuable salmonids. Management of salmonid fisheries. ***Prerequisites: BIOL F115X.*** (3+0)

FISH F382 **Biology of Commercially Important Marine Fishes**
4 Credits Offered as Demand Warrants
Review of the major marine fish resources of Alaska. Taxonomy, distribution, life history, and ecological relationships of marine fishes, with emphasis on demersal fishes, early life history and the effects of fisheries on stocks. ***Prerequisites: BIOL F115X.*** (0+0)

FISH F383 **Biology of Commercially Important Invertebrates**
4 Credits Offered as Demand Warrants
The taxonomy, morphology, physiology and ecology of commercially important invertebrates. History of management and fisheries for the major species presented. Emphasis on Alaska species. ***Prerequisites: BIOL F115X.*** (0+0)

FISH F411 **Human Dimensions of Environmental Systems**
3 Credits Offered Fall
Study of human environment relationships and applications to resource management. Draws on a range of social scientific approaches to the study of environmental systems, including: environmental anthropology, environmental history, historical ecology, political ecology, ethnoecology, property theory, and environmental justice. ***Prerequisites: COMM F131X or F141X; ENGL F211X or F213X; F200-level course in cultural anthropology, human geography, sociology, or political science; or permission of instructor.*** (3+0)

FISH F412 **Human-Environment Research Methods**
3 Credits Offered Spring
Overview of qualitative and quantitative social science methods for studying human-environment relationships. Introduction to research ethics, research design, data collection, data analysis and data reporting. Methods and data analysis techniques include interviews, text analysis, surveys, scales, cognitive anthropology and ethnoecology, social networks, behavioral observation, and visual methods. Provides hands-on training in data collection and data analysis software. ***Prerequisites: FISH 411; junior or senior standing; or permission of instructor.*** Cross-listed with ANTH F412. (3+0)

FISH F418 **Renewable Resource Management Systems**
4 Credits Offered Fall Odd-numbered Years
Develops abilities to recognize, process and apply critical information in the management of renewable resources by examples from Alaska fisheries. The computer as a primary tool of resource management. This course is taught in Juneau. ***Prerequisites: STAT F200X [STAT S273-J]. Recommended: STAT F401.*** (4+0)

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FISH F420 **Modeling, Simulation and Ecological Theory**
3 Credits Offered as Demand Warrants
Introduction to formal models (mathematical, graphical and simulation) in fisheries and ecology. Nature and uses of modeling approaches; choice of assumptions; simulation techniques and model verification; examples and case histories This course is taught in Juneau. ***Prerequisites: BIOL F271 (BIOL S281-J); MATH F200X.*** (3+0)

FISH F421 **Fisheries Population Dynamics**
4 Credits Offered Spring Even-numbered Years
Review and analysis of the major quantitative techniques available for assessing and predicting the status of fish populations. Demonstration and use of field and laboratory techniques and model verification; examples and case histories. This course is taught in Juneau. ***Prerequisites: STAT F200X [STAT S273-J]. Recommended: FISH F418.*** (4+0)

FISH F425 **Fish Ecology**
3 Credits Offered Fall
Focus on the relationship of fishes to the physical, chemical, and biological features of their environment and the processes responsible for patterns of fish distribution and abundance. Concepts introduced in lectures will follow a logical progression, starting with the study of individual fish moving towards investigations of populations, metapopulations, and assemblages. ***Prerequisites: BIOL F115X; BIOL F271; FISH F101; or permission of instructor. Recommended: FISH F288.*** (3+0)

FISH F426 **Behavioral and Physiological Ecology of Fishes**
3 Credits Offered Spring Even-Numbered Years
Advanced understanding of behavioral and physiological responses and adaptations of fishes to natural and anthropogenic environmental variables. Students should have a sound understanding of both ecological and biological concepts relating to fish. ***Prerequisites: BIOL F115X; BIOL F116X; FISH F288; or permission of instructor. Recommended: FISH F425 or BIOL F271; FISH F427.*** Stacked with FISH F626. (3+0)

FISH F427 **Ichthyology** (n)
4 Credits Offered Spring
Major groups of fishes, emphasizing fishes of northwestern North America. Classification structure, evolution, general biology and importance to man. ***Prerequisites: BIOL F317.*** Cross-listed with BIOL F427. (3+3)

FISH F436 **Salmon Culture**
3 Credits
Biology and technology of artificial propagation of salmonids. Reproduction, embryology, growth, nutrition, genetics and pathology of salmonids in both extensive (sea ranching) and intensive rearing systems. Bioengineering of incubators, rearing containers, water diversion systems and other related topics. Laboratory exercises in measuring effects of environmental characteristics on development and growth of salmon. This course is taught in Juneau. ***Prerequisites: BIOL F222 [BIOL S209-J]; CHEM F106X; FISH F381.*** (3+0)

FISH F445 **Sampling Methods in Fisheries**
3 Credits Offered Spring Even-numbered Years
A review of standard and specialized sampling techniques in aquatic habitats. Basic sampling theory and statistical consideration, demonstrations, use of field laboratory techniques, shipboard sampling. This course is taught in Juneau. ***Prerequisites: STAT F200X [STAT S273-J].*** (2+2)

FISH F450 **Practicum in Fisheries: Fisheries Observer Program**
3 Credits Offered as Demand Warrants
Practical experience as a fisheries biologist onboard an Alaska commercial fishing vessel doing independent work at sea as an agent for the National Marine Fisheries Service or the Alaska Department of Fish and Game. Simultaneous to credit, the student/observer will be under contract and receive reimbursement for deployment. May be repeated for additional credit during different deployments as observer. Graded Pass/Fail. Special fees apply. ***Prerequisites: STAT F200X or permission of instructor.*** (0+1-12)

FISH F460 **Food Science and Technology Internship**
3-6 Credits Offered as Demand Warrants
A combination of traditional and industrial training opportunities. Assigned required readings and discussion of appropriate topics in food science and technology. Information applied during hands-on experience in a food processing plant. Discussion includes fundamental information and solutions to industrial problems. Faculty mentor assigned to each intern. Required written evaluation of internship. 30 hours in-plant work experience for 12-24 weeks. Note: Course offered only in Kodiak. ***Prerequisites: 16 credits in natural sciences; MATH F200X or MATH F272X; or permission of instructor.*** Cross-listed with FSN F460. (1+0+3)

FISH F487 W,O **Fisheries Management**
3 Credits Offered Spring
Theory and practice of fisheries management, with an emphasis on strategies utilized for the management of freshwater and marine fisheries. Application of quantitative methodologies for the assessment and manipulation of aquatic habitats, sport and commercial fish populations, and stock assessment are considered, as is the setting of appropriate goals and objectives for effective, science-based management. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; ENGL F414; FISH F425; or permission of instructor.*** Cross-listed with NRM F487. (3+0)

FISH F490 **Experiential Learning — Fisheries Internship**
1 Credit
Under the supervision of a faculty member and a fisheries professional, upper-division students gain professional experience through employment. Requirements are decided prior to enrollment based on a 3-way agreement between the employer, student, and faculty member, which contains learning objectives that reflect upper-division credit. Can be repeated up to 4 times, each for a different type of employment. Graded Pass/Fail. ***Prerequisites: Junior or senior standing plus permission of Faculty Sponsor and the Fisheries Experiential Learning Coordinator/instructor (the Coordinator can be a sponsor as well); signing of a student internship agreement form that contains learning objectives for the internship that reflects upper-division internship credit. Recommended: FISH F315; STAT F200X; STAT F401.*** (0+0+1-4)

FISH F499 **Fisheries Senior Thesis**
2 Credits
Prerequisites: ENGL F414; STAT F200X; Fisheries major with senior standing and a GPA of 3.2 or higher; permission of Faculty mentor and the Fisheries Experiential Learning Coordinator/instructor (the Coordinator may be a mentor) after submission of a preproposal. Recommended: FISH F315; STAT F401; STAT F402. (0+0+2-4)

FISH F601 **Quantitative Fishery Science**
3 Credits Offered Spring Even-numbered Years
(2+3)

FISH F603 **Writing for Fisheries and Ocean Sciences Workshop**
1 Credit Offered Spring
Skills required to prepare and present fisheries technical information in journal articles and other formats. Proficiency in writing, editing, peer reviewing written fisheries and ocean sciences communications. Requires graduate standing and requires students to write about data gathered for graduate thesis. Students bring their own research data as basis for work. Graded Pass/Fail. ***Prerequisites: ENGL F414 or ENGL F614 or permission of instructor.*** (1+0)

FISH F604 **Modern Applied Statistics for Fisheries**
4 Credits Offered Odd-numbered Years
Covers general statistical approaches to quantitative problems in marine science and fisheries with guidance on how to collect and organize data, how to select appropriate statistical methods and how to communicate results. A variety of advanced statistical methods for analyzing environmental data sets will be illustrated in theory and practice. ***Prerequisites: STAT F200; STAT F401; proficiency in computing with R or permission of instructor.*** Cross-listed with: MSL F604. (3+3)

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FISH F612 **Fish Conservation Biology**
4 Credits Offered Fall Odd-numbered Years
Conservation biology is an applied science that deals with maintaining and restoring threatened populations. Includes theoretical foundations of conservation biology and the practical lessons to be gained from studying historical conservation efforts. Emphasis on case studies. ***Note: This course is taught in Juneau.*** (3+2)

FISH F615 **Fish Bioenergetics**
3 Credits
Fundamentals of bioenergetics as they apply to sub-arctic fish, basic components of fish growth, energy requirements and energy storage. Analysis of energy required to survive, feed and reproduce successfully. Ecosystem-level trophodynamics and their role in individual as well as population success; the use of biomass and energy-based models to quantify fish growth, consumption rates, biomass removals, assimilation efficiencies and developing bioenergetic models Course offered in Kodiak and via videoconference in Fairbanks and Juneau. (3+0)

FISH F621 **Estimation of Fish Abundance**
3 Credits
Estimation of abundance of fish and other aquatic populations, using mark-recapture, line-transect, catch-effort and change-in-ratio techniques. Computer lab work and homework from actual and simulated populations. ***Prerequisites: MATH F201X; STAT F401; familiarity with PC's including word processing and spreadsheets. Recommended: FISH F421; MATH F302; MATH F314.*** (2+2.5)

FISH F622 **Quantitative Fish Population Dynamics II**
3 Credits Offered Alternate Spring
Modeling fish population mortality, recruitment individual growth and fecundity. Models and assessment techniques for age- and length-structured populations. Biological reference points and management strategies derived from population and harvesting parameters. Computer lab work and homework with data from actual and simulated populations. This course is taught in Juneau. ***Prerequisites: FISH F621.*** (2+2.5)

FISH F625 **Analysis of Vertebrate Population Survival and Movement**
3 Credits Offered Spring Odd-numbered Years
Contemporary methods of estimation of fundamental population parameters, survival and movement, with their implications for management. Focus will be on assumptions and methodology of estimation techniques. State-of-the-art computer applications will be employed in laboratory exercises of actual and simulated data. This course is taught in Juneau. ***Prerequisites: BIOL F271; an advanced course in statistics.*** Cross-listed with WLF F625. (2+3)

FISH F626 **Behavioral and Physiological Ecology of Fishes**
3 Credits Offered Spring Even-numbered Years
Advanced understanding of behavioral and physiological responses and adaptations of fishes to natural and anthropogenic environmental variables. Students should have a sound understanding of both ecological and biological concepts relating to fish. ***Recommended: BIOL F115X; BIOL F116X; FISH F288; FISH F425 or BIOL F271; FISH F427; or permission of instructor.*** Stacked with FISH F426. (3+0)

FISH F627 **Statistical Computing with R**
2 Credits Offered Alternate Fall, As Demand Warrants
Using the free, open-source software R to teach computing, programming, and modeling concepts for the statistical analysis of fisheries and biological data. Prepares students for other graduate-level, quantitative fisheries courses and covers exploratory statistical and graphical analyses, as well as computer-intensive methods such as bootstrapping and randomization tests. ***Prerequisites: STAT F200X or equivalent, STAT F401 or equivalent, and proficiency with Excel; or permission of instructor.*** Cross-listed with MSL F627. (1+3)

FISH F630 **Natural Resource Modeling**
2 Credits Offered Spring Odd-numbered Years
A hands-on introduction to the techniques and issues involved in modeling natural resources. Students will complete an individual modeling project related to each student's graduate research. This course is taught in Juneau. ***Prerequisites: FISH F421 and STAT F401 or equivalents.*** (1+3)

FISH F633 **Pacific Salmon Life Histories**
3 Credits Offered Fall Even-numbered Years
Life history patterns of species and stocks of Pacific salmon compared. Evolutionary models to explain the variety of patterns. Effects of human activities on species and stock; conservation of salmon resources. Discussion and analysis of readings. This course is taught in Juneau. ***Prerequisites: FISH F427.*** (3+0)

FISH F640 **Management of Renewable Marine Resources**
3 Credits Offered Spring Even-numbered Years
Principles of fisheries management, along with case studies of successes and failures. Topics include management objectives, relationships of fished species to their environment, fishing methods, human dimensions, fishery data acquisition, harvest strategies, ecosystem effects of fishing, aquaculture and alternative management strategies, including ecosystem-based fishery management. ***Prerequisites: FISH F427. Recommended: FISH F487.*** (3+0)

FISH F642 **Bayesian Decision Theory for Resource Management**
4 Credits Offered Spring Even-numbered Years
Application of decision theory to problems in natural resources management. Students will learn to perform Bayesian calculations and uncomplicated decision analysis themselves. Special fees apply. ***Prerequisites: FISH F621 or FISH F630 or permission of instructor.*** Cross-listed with STAT F642. (2+2)

FISH F650 **Fish Ecology**
3 Credits Offered Fairbanks: Alternate Fall; Offered Juneau:As Demand Warrants
The ecology of fish is examined from the community aspect. Current literature on inter- and intraspecific relationships, influence of the environment on community structure, behavior and production. ***Prerequisites: Permission of instructor.*** Cross-listed with BIOL F650. (2+3)

FISH F651 **Fishery Genetics**
4 Credits Offered Spring Odd-numbered Years
Application of genetics to fisheries. Focus on Alaska fisheries including introduction to the theory of electrophoresis, stock separation, population genetics and quantitative genetics. This course is taught in Juneau. (4+0)

FISH F653J **Zooplankton Ecology**
3 Credits Offered Spring Even-numbered Years
Survey of marine zooplankton including processes and variables which influence their production and dynamics. Emphasis on the northeast Pacific ocean zooplankton community. Field and lab methods for sampling include fixing, preserving, subsampling, identifying and quantifying zooplankton collections. Laboratory techniques for culture of zooplankton include physiological measurements of bioenergetic parameters. ***Prerequisites: Invertebrate zoology course; MSL F610; or permission of instructor.*** Cross-listed with MSL F653J. (3+0)

FISH F654J **Benthic Ecology**
3 Credits Offered Spring Odd-numbered Years
Ecology of marine benthos, from subtidal to hadal zone. Methods of collecting, sorting, narcotizing, preserving and analyzing benthic assemblages, including video analytical techniques from submersibles and ROV's. Hydrothermal vent and cold seep assemblages. Physiology/energetics of benthic organisms, including animal-sediment relationships, feeding, reproduction and growth. Depth, spatial and latitudinal distribution patterns. ***Prerequisites: Invertebrate zoology course; marine biology course; or permission of instructor.*** Cross-listed with MSL F654. (3+0)

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FISH F661 **Seafood Processing and Preservation**
3 Credits Offered Spring
Positive and negative aspects of processing and preservation of seafoods are discussed. Practical aspects of preservation are stressed and topics include thermal processing (canning and pasteurization), fish smoking, salting, drying, pickling, freezing, fermentation, natural preservatives and packaging. Aspects of selected processing and preservation techniques to be demonstrated in the FITC pilot plant. ***Prerequisites: BIOL F342; CHEM F451; or permission of instructor. Recommended: MATH F202X or MATH F272X.*** Cross-listed with FSN 661; FSN F661K. (3+0)

FISH F662 **Seafood Composition and Analysis**
3 Credits Offered Fall
Major components of foods, their properties, analysis and interactions during processing and preservation, the effect of processing on functional and nutritive value, postmortem microbial and biochemical changes especially proteins, lipids and carbohydrates. Role of minor constituents such as flavors, vitamins, toxins and carcinogens. This course is offered via videoconference ***Prerequisites: BIOL F342; CHEM F451; or permission of instructor.*** Cross-listed with FSN F662. (3+0)

FISH F665 **Aquatic Entomology**
2 Credits Offered Fall
Aquatic invertebrate taxonomy, mostly to the family level, and ecology. Includes field trips to learn collecting techniques and habitats. ***Prerequisites: Graduate standing or permission of instructor; students must be able to safely wade in streams and wetlands.*** Cross-listed with BIOL F665. (1+3)

FISH F666 **Biological Assessment in Fisheries and Aquatic Environments**
3 Credits Offered Alternate Spring
(3+0)

FISH F675 **Political Ecology of the Oceans**
3 Credits Offered Alternate Spring
Introduction to the field of political ecology in the marine sphere. Topics include the sociology of scientific knowledge, traditional and local ecological knowledge, politics of resource management, processes of marine enclosure, environmental values, marine conservation, environmental justice, and colonialism and economic development. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with ANTH F675. (3+0)

FOOD SCIENCE AND NUTRITION

FSN F460 **Food Science and Technology Internship**
3-6 Credits Offered as Demand Warrants
A combination of traditional and industrial training opportunities. Assigned required readings and discussion of appropriate topics in food science and technology. Information applied during hands-on experience in a food processing plant. Discussion includes fundamental information and solutions to industrial problems. Faculty mentor assigned to each intern. Required written evaluation of internship. 30 hours in-plant work experience for 12-24 weeks. Note: Course offered only in Kodiak. ***Prerequisites: 16 credits in natural sciences; MATH F200X or MATH F262X; or permission of instructor.*** Cross-listed with FISH F460. (1+0+3)

FSN F611 **International Food Marketing Systems**
3 Credits Offered as Demand Warrants
Holistic approach to examining the seafood marketing system from a global perspective. For upper undergraduates and first year graduate students. Note: This course is taught in Kodiak. ***Prerequisites: Senior or graduate standing; permission of instructor.*** (3+0)

FSN F612 **Economics of Seafood Markets**
3 Credits Offered as Demand Warrants
Mathematical approach to examining food markets and marketing. Basic economic principles such as price formation, market structure and welfare economics. Topics include trade and natural resource policies and bioeconomic modeling of food systems. Note: This course is taught in Kodiak. ***Prerequisites: Graduate standing; permission of instructor.*** (3+0)

FSN F613 **Quantitative Marketing Research and Food System Modeling**
3 Credits Offered as Demand Warrants
Quantitative market research. Bioeconomic modeling for food systems such as optimal harvest for wild-caught and farm-raised aquatic products in different scenarios. Note: This course is taught in Kodiak. ***Prerequisites: FSN F611; MATH F200X or equivalent; STAT F200X or equivalent; or permission of instructor.*** (3+0)

FSN F614 **Food Marketing Management**
3 Credits
How to think like a marketing manager, marketing opportunities, developing marketing strategies, planning marketing programs and managing the marketing effort for food products.Note: This course is taught in Kodiak. ***Prerequisites: FSN F611; FSN F612; graduate standing; or permission of instructor.*** (3+0)

FSN F661 **Seafood Processing and Preservation**
3 Credits Offered Spring
Positive and negative aspects of processing and preservation of seafoods are discussed. Practical aspects of preservation are stressed and topics include thermal processing (canning and pasteurization), fish smoking, salting, drying, pickling, freezing, fermentation, natural preservatives and packaging. Aspects of selected processing and preservation techniques to be demonstrated in the FITC pilot plant. ***Prerequisites: BIOL F342; CHEM F451; or permission of instructor. Recommended: MATH F202X or MATH F272X.*** Cross-listed with FISH F661; FSN F661K (3+0)

FSN F661K **Seafood Processing and Preservation**
3 Credits Offered Spring
Positive and negative aspects of processing and preservation of seafoods are discussed. Practical aspects of preservation are stressed and topics include thermal processing (canning and pasteurization), fish smoking, salting, drying, pickling, freezing, fermentation, natural preservatives and packaging. Aspects of selected processing and preservation techniques to be demonstrated in the FITC pilot plant. Note: This course is taught in Kodiak. ***Prerequisites: BIOL F342; CHEM F451; or permission of instructor. Recommended: MATH F202X or MATH F272X.*** Cross-listed with FISH F661; FSN F661. (3+0)

FSN F662 **Seafood Composition and Analysis**
3 Credits Offered Fall
Major components of foods, their properties, analysis and interactions during processing and preservation, the effect of processing on functional and nutritive value, postmortem microbial and biochemical changes especially proteins, lipids and carbohydrates. Role of minor constituents such as flavors, vitamins, toxins and carcinogens. This course is offered via videoconference. ***Prerequisites: BIOL F342; CHEM F451; or permission of instructor.*** Cross-listed with FISH F662 (3+0)

FSN F663 **Statistical Quality Control and Sensory Evaluation**
3 Credits
Principles of quality control and assurance; quality control philosophy and development of quality control systems and their application in the seafood industry; procedures and test methods used to evaluate the sensory properties of seafood products; use and application of statistical methods in quality control and sensory analysis. Note: This course is taught in Kodiak. ***Prerequisites: STAT F200X; or STAT F300; or permission of instructor.*** (3+0)

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FSN F671 Unit Operations in Food Processing
4 Credits
Engineering principles governing the transfer and change of materials and energy primarily by physical means will be discussed. Unit operations covered are refrigeration, freezing, thermal processing, evaporation, drying, contact equilibrium processed (washing and extraction), sedimentation, centrifugation, filtration and mechanical size reduction. Note: This course is taught in Kodiak. ***Prerequisites: MATH F200X; FSN F661K; ME F441 is desirable; or permission of instructor.*** (3+3)

FSN F672 Laboratory Methods in Food Science and Nutrition
4 Credits
Provides a graduate-level laboratory experience of standard food chemistry, food biochemistry, food microbiology, physical properties of food and food sensory methods. Note: This course is taught in Kodiak. ***Prerequisites: FSN F662; or permission of instructor.*** (4+0)

FSN F673 Current Topics in Food Science and Nutrition
3 Credits
Recent advances in food science and nutrition and their application to food production. Study of research problems in food chemistry, food engineering and food microbiology. Topics may include nutritional effects of food processing, innovative processing methods for underutilized species and application of technologies from other industries. Note: This course is taught in Kodiak. ***Prerequisites: 6 credits in FSN F600-level courses or permission of instructor.*** (3+0)

FSN F692 Food Science and Nutrition Seminar
1 Credit Offered as Demand Warrants
Selected topics in food science and nutrition are presented by graduate students and guest speakers. Requires a high level of student participation. This course is offered via videoconference. Graded Pass/Fail. ***Prerequisites: Graduate standing in Interdisciplinary degree program in Seafood Science and Nutrition or another degree program; or permission of instructor.*** (1+0)

FSN F692K Food Science and Nutrition Seminar
1 Credit Offered as Demand Warrants
Selected topics in food science and nutrition are presented by graduate students and guest speakers. Required a high level of student participation. This course is offered via videoconference. Note: This course is taught in Kodiak. Graded Pass/Fail. ***Prerequisites: Graduate standing in Interdisciplinary degree program in Seafood Science and Nutrition or another degree program; or permission of instructor.*** (1+0)

FOREIGN LANGUAGES

FL F200X World Literature (h)
3 Credits
Introduction to critical reading and appreciation of a wide variety of literary texts from different cultures. Includes exposure to a variety of approaches to myth, poetry, story telling and drama. Students will gain an understanding of cultural differences and universals in texts from American, American minority, Western European and non-Western sources. Specific content to be announced at time of registration. Course may be repeated for credit when content varies. ***Prerequisites: ENGL F111X or placement in ENGL F211X/ ENGL F213X; sophomore standing; or permission of instructor.*** Cross-listed with ENGL F200X. (3+0)

FL F451 Foreign Language Teaching Practicum
4 Credits Offered Fall
Methodology workshop for the advanced second language student. Includes language acquisition and pedagogy and employment of these techniques in a lower level language classroom under the supervision of a classroom teacher. ***Prerequisites: Completion through the F200-level language classes. Recommended: Completion of the F300-level language classes is recommended.*** (3+0+3-5)

FRENCH

FREN F101 Elementary French I (h)
5 Credits Offered Fall
Introduction to the French language and culture. Development of competence and performance in the language through understanding, recognition and use of linguistic structures; increasing emphasis on listening comprehension and speaking; basic vocabulary of approximately 1,000 words; exploration of the cultural dimension, implicitly through language, and explicitly through texts and audiovisual materials. (5+0)

FREN F102 Elementary French II (h)
5 Credits Offered Spring
Introduction to the French language and culture. Development of competence and performance in the language through understanding, recognition and use of linguistic structures; increasing emphasis on listening comprehension and speaking; basic vocabulary of approximately 1,000 words; exploration of the cultural dimension, implicitly through language, and explicitly through texts and audiovisual materials. ***Prerequisites: FREN F101 or equivalent*** (5+0)

FREN F103 Conversational French I (h)
3 Credits Offered as Demand Warrants
Oral skills improvement. Includes group work, presentations, skits, discussions and vocabulary to improve speaking on specific topics. Graded Pass/ Fail. ***Prerequisites: FREN F102 or equivalent or permission of instructor. Does not satisfy core curriculum or foreign language major requirements.*** (3+0)

FREN F201 Intermediate French I (h)
3 Credits Offered Fall
Continuation of FREN F102. Increasing emphasis on reading ability and cultural material. Conducted in French. ***Prerequisites: FREN F102 or equivalent.*** (3+0)

FREN F202 Intermediate French II (h)
3 Credits Offered Spring
Increasing emphasis on reading ability and cultural material. Conducted in French. ***Prerequisites: FREN F201 or equivalent.*** (3+0)

FREN F203 Conversational French II (h)
3 Credits Offered as Demand Warrants
Oral skills improvement. Includes group work, presentations, skits, discussions and vocabulary to improve speaking on specific topics. Graded Pass/ Fail. ***Prerequisites: FREN F102 or equivalent or permission of instructor. Does not satisfy core curriculum or foreign language major requirements.*** (3+0)

FREN F301 O Advanced French (h)
3 Credits Offered Fall
Discussions and essays on more difficult subjects or texts. Translations, stylistic exercises and special grammatical problems. Conducted in French. ***Prerequisites: COMM F131X or COMM F141X; FREN F202 or equivalent; or permission of instructor.*** (3+0)

FREN F302 O Advanced French (h)
3 Credits Offered Spring
Discussions and essays on more difficult subjects or texts. Translations, stylistic exercises and special grammatical problems. Conducted in French. ***Prerequisites: COMM F131X or COMM F141X; FREN F301 or equivalent; or permission of instructor.*** (3+0)

FREN F431 W Studies in the Culture of the French Speaking World (h)
3 Credits Offered Fall Odd-numbered Years
Intensive study of selected aspects of the culture of the French-speaking world. Course may be repeated for credit if topic varies. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; FREN F302 or equivalent; junior standing; or permission of instructor.*** (3+0)

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FREN F432 W **Studies of French Literature** (h)
3 Credits Offered Fall Even-numbered Years
Intensive study of authors, literary texts, movements, genres, themes and/or critical approaches. Course may be repeated for credit if topic varies. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; FREN F302 or equivalent; junior standing; or permission of instructor.*** (3+0)

FREN F434 W **La Litterature Quebecoise** (h)
3 Credits Offered as Demand Warrants
In-depth study of a variety of French language literature from Quebec as well as from other Canadian provinces. Examination of the historical and cultural events which have influenced this literature. Taught entirely in French. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; FREN F302 or equivalent; or permission of instructor.*** (3+0)

FREN F488 **Individual Study: Senior Project** (h)
3 Credits Offered as Demand Warrants
The student will demonstrate the ability to work with the language and the culture through the analysis and presentation, in the language, of a problem chosen by the student in consultation with the department. The student must apply for senior project and submit a project outline by the end of the 6th week of the semester preceding the semester of graduation. Conducted in French. ***Prerequisites: At least ten credits in upper-division French or permission of instructor.*** (3+0)

GEOGRAPHY

GEOG F101 **Expedition Earth: Introduction to Geography** (s)
3 Credits
Introduction to essential concepts and approaches of geographic study. Explores physical, political, economic and cultural geography of major world culture regions. Examines each region in relation to others, and in context of global economic, political and environmental change. Also available through the Center for Distance Education. (3+0)

GEOG F111 **Earth and Environment: Elements of Physical Geography**
3 Credits
Introduction to Earth's dynamic environments, systems, and cycles. Major course sections include: 1) Landscapes- continents, oceans, mountains and landforms. 2) Weather and Climate- weather, storms, climate change, ocean systems, and 3) Ecosystems and Biomes found on Earth. Examine how Earth systems are dynamically linked, how they change, and how humans influence and are conditioned by the environment. (Offered every spring at the Northwest Campus.) (3+0)

GEOG F111X **Earth and Environment: Elements of Physical Geography** (n)
4 Credits
Introduction to Earth's dynamic environments, systems, and cycles. Major course sections include: 1) Landscapes- continents, oceans, mountains and landforms. 2) Weather and Climate- weather, storms, climate change, ocean systems, and 3) Ecosystems and Biomes found on Earth. Examine how Earth systems are dynamically linked, how they change, and how humans influence and are conditioned by the environment. Lab section includes map and aerial photo interpretation, field trips, introduction to remote sensing of patterns on Earth. (Offered every spring at the Northwest Campus.) Special fees apply. (4+0)

GEOG F203 **World Economic Geography** (s)
3 Credits Offered as Demand Warrants
Study of the world's major economic activities: their physical and cultural bases, spatial growth and distribution patterns, and their significance in interregional and international development. (3+0)

GEOG F300 **Internship in Natural Resources Management and Geography**
1-6 Credits Offered as Demand Warrants
Supervised pre-professional experience in a business or agency (public or private). Open to students majoring or minoring in natural resources management and geography only. Course may be repeated for credit up to a maximum of 6 credits. ***Prerequisites: NRM F101 for natural resources management majors or GEOG F101 for geography majors; junior standing with 3.0 GPA; permission of instructor; an approved internship plan.*** Cross-listed with NRM F300. (1-6+0)

GEOG F301 **Geographic Field Studies**
3 Credits Offered as Demand Warrants
Application of geographic methods for conducting field investigations. Involves planning and preparation for field study and collection, analysis, interpretation, and reporting of data collected through field study of natural and human phenomena. ***Prerequisites: Permission of instructor.*** (3+0)

GEOG F302 **Geography of Alaska** (s)
3 Credits Offered Spring
Regional, physical and economic geography of Alaska. Special consideration of the state's renewable and nonrenewable resources and of plans for their wise use. Frequent class study of representative maps and visual materials. Also available through the Center for Distance Education. (3+0)

GEOG F303 **Geography of United States and Canada** (s)
3 Credits Offered Fall Even-numbered Years
In-depth examination of the natural, political, cultural, and economic characteristics of the U.S. and Canada and their major sub-regions. Explores contrasts in U.S. and Canadian historical, cultural and political geography; sources of national identity; and interactions with aboriginal peoples. Includes economic and political relationships between the two countries, and the role each has played in current and historical world affairs. ***Prerequisites: An introductory geography course or background in United States or Canadian history, social science, or cultures; or permission of instructor.*** (3+0)

GEOG F305 W **Geography of Europe** (s)
3 Credits Offered Spring Even-numbered Years
In-depth examination of the natural, political, cultural and economic characteristics of Europe and its major sub-regions. Explores current political and economic transformations, historical and contemporary world influences, and issues of nationalism and identity. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; an introductory geography course or background in European history, social science, or culture; or permission of instructor.*** (3+0)

GEOG F306 **Geography of Russia** (s)
3 Credits Offered Spring Even-numbered Years
The physical, cultural and historical geography of Russia and the Ukraine, Central Asia, Siberia and parts of Eastern Europe. (3+0)

GEOG F307 **Weather and Climate**
3 Credits Offered Spring Odd-numbered Years
Weather systems and climate classification. Emphasis on weather system processes, measuring weather variables and physical processes of the atmosphere. ***Prerequisites: GEOG F111 or GEOG F111X; or permission of instructor.*** (3+0)

GEOG F309 **Cartography** (s)
4 Credits Offered Spring Odd-numbered Years
Graphic techniques for presenting geographic data and patterns through the construction of thematic maps. Emphasis on map design. Special fees apply. ***Prerequisites: Permission of instructor.*** (4+0)

GEOG F311 W **Geography of Asia** (s)
3 Credits Offered Fall Odd-numbered Years
Examines the natural, political, cultural, and economic characteristics of China, Japan, India-Pakistan, Southeast Asia, and the Asiatic countries of the Middle East. Explores historical and current political and economic transformations, historical, and contemporary world influences, and foundations

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of regional political, economic, and military conflicts. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; an introductory geography course or background in Asian history, social science, or culture; or permission of instructor.*** (3+0)

GEOG F312 **People, Places, and Environment: Principles of Human Geography** (s)
3 Credits Offered Spring Odd-numbered Years
Examines how human activity manifests itself on the earth's surface through the geographic lenses of ethnicity, politics, industry, language, religion, and demographics. Explores spatial patterns, relationships and contrasts between places, origin and diffusion of traits, and human interactions with the environment. ***Prerequisites: GEOG F101 or GEOG F203; or permission of instructor.*** (3+0)

GEOG F338 **Introduction to Geographic Information Systems**
3 Credits Offered Fall
Geographic data concepts including mapping systems, data sources, editing data, GIS analysis and computer mapping. Introduction to global positioning systems. GIS applications in natural resources management. ***Prerequisites: Knowledge of PC's or Unix workstations desirable.*** Cross-listed with NRM F338. (2+3)

GEOG F339 **Maps and Landscape Analysis** (n)
3 or 4 Credits Offered Spring
Topographic map interpretation for landscape analysis and geographic data acquisition, including topographic features, vegetation patterns, and political and cultural features. Emphasis on topographic maps for remote data acquisition and environmental impact analysis. Optional laboratory for one additional credit. ***Prerequisites: GEOG F101 or GEOG F203; GEOG F111X; GEOS F304.*** (3+0 or 3)

GEOG F402 **Resources and Environment** (s)
3 Credits Offered Fall Even-numbered Years
Interdisciplinary analysis of the Earth as a natural resource base, and the management issues of resource extraction, allocation, development, conservation and preservation. ***Prerequisites: GEOG F101; GEOG F111X.*** (3+0)

GEOG F404 W **Urban Geography** (s)
3 Credits Offered as Demand Warrants
A world survey of urbanization with particular emphasis on the accelerating urban revolution. Conditions favoring the rise of cities, locational and site factors, regional and interregional resource availability, and human factors. Changing functions and patterns of urban areas. National and international problems inherent in trends toward a predominantly urbanized economy and culture. Implications of urbanization in Alaska. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; GEOG F101.*** (3+0)

GEOG F405 **Political Geography** (s)
3 Credits Offered as Demand Warrants
Geographical analysis of the evolution, structure, internal coherence and sources of strength of individual nation states, with emphasis on nations of the Pacific realm and Arctic periphery. Consideration of regional blocs, spheres of influence and potential for international cooperation. ***Prerequisites: GEOG F101.*** (3+0)

GEOG F408 **Quantitative Research Techniques**
3 Credits Offered Spring Odd-numbered Years
Analysis of geographic data. Includes sampling techniques, lab techniques and applied statistical analysis (computational and computer based). Nonparametric and parametric statistical tests using geographic and environmental data sets, and interpretation of statistical results. ***Prerequisites: College-level mathematics; junior standing; or permission of instructor.*** (3+0)

GEOG F410 **Geography of the Pacific Rim**
3 Credits Offered Fall Odd-numbered Years
Examines the physical and human geography of the Pacific Rim. Will employ both a global and topical approach and include aspects of environmental, historic, economic, social, and political issues. Regional studies on physical and human geographic attributes of selected countries will be analyzed and compared. ***Prerequisites: GEOG F101; GEOG F111; or permission of instructor. Recommended: GEOG F338 or GEOG F341.*** (3+0)

GEOG F412 **Geography of Climate and Environmental Change**
3 Credits Offered Fall
Serves as a "synthesis" breadth course focusing on the geography of climate and environmental change. The major concepts of global climate processes and climate change will be reviewed on multiple time scales. The impacts of natural and anthropogenic environmental change will be examined through selected case studies and readings (e.g. permafrost, invasive species, sea ice, fire, urbanization). ***Prerequisites: BIOL F271; GEOG F307; or permission of instructor.*** (3+0)

GEOG F418 **Biogeography**
3 Credits Offered Fall
Explores the geography of life by examining linkages between climate, geomorphology, and ecological communities with emphasis on the biogeography of subarctic, polar and alpine regions. ***Prerequisites: BIOL F271 or NRM F277 or BIOL F277; junior or senior standing, or permission of instructor.*** (3+0)

GEOG F420 **Geopolitics of Energy** (s)
3 Credits Offered Spring Odd-numbered Years
Examines the impacts that energy resource exploration, development, production, and transportation have on the internal politics of various countries in the world, and on international economic and political relationships. Explores the cultural, political, economic, physical, and historical underpinnings of contemporary geopolitical events involving energy resources, and explores possible future scenarios. ***Prerequisites: Any of the following courses: GEOG F101; GEOG F203; GEOG F312; GEOG F405; NRM F101; NRM F304; PS F201; PS F203; PS F321; PS F323; ECON F235; ECON F335; ECON F349; ECON F463; junior standing; or permission of instructor. Recommended: GEOG F101.*** (3+0)

GEOG F427 **Polar Geography** (s)
3 Credits Offered Spring
Comparative physical, cultural, political and economic geography of the circumpolar north and antarctic regions. Special attention given to arctic natural resource development and climate change in both polar regions. ***Prerequisites: GEOG F101 or GEOG F111X or GEOG F203; or permission of instructor.*** Cross-listed with NORS F627. Stacked with GEOG F627; NORS F627. (3+0)

GEOG F435 **GIS Analysis**
4 Credits Offered Spring
GIS analysis of natural resources including spatial query, attribute query, vector, grid, image, topographic and network analysis techniques. Cross-listed with NRM F345. (4+0)

GEOG F463 **Wilderness Concepts**
3 Credits Offered Fall
History and evolution of wilderness thought, the contemporary meaning of wilderness, and survey of economic and noneconomic wilderness values for individuals and society. Cross-listed with NRM F463. Stacked with GEOG F663; NRM F663. (3+0)

GEOG F464 **Wilderness Management**
3 Credits Offered Spring
Wilderness ecology and land management practices on lands designated as wilderness. Plus, visitor management regimes are analyzed. Both national and international views of wilderness are presented. ***Prerequisites: A basic course in ecology; resource management; or permission of instructor.*** Cross-listed with NRM F464 (3+0)

GEOG F475 **National Park Concepts**
3 Credits Offered Spring
History of the national park ideal, the evolution of the National Park Service, and the geography of the national park system. Contemporary national park policy and management case studies, including controversies resulting from

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competing visions. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

GEOG F488 **Geographic Assessment and Prediction of Natural Hazards**
3 Credits Offered Fall
Integrate aspects of physical geography with the human dimension via the study of the assessment and prediction of natural hazards. Guest speakers, case studies, and applied practical exercises will help students transition from content-based courses to applying their knowledge in "real-world" situations, using geographic tools in remote sensing and GIS. ***Prerequisites: GEOG F341 or permission of instructor.*** (3+0)

GEOG F489 W **Senior Practicum: Field Studies in Landscape Analysis and Climate Change** (n)
4 Credits Offered Fall
Capstone field practicum for the Landscape Analysis and Climate Change track in Geography. The entire semester will be focused on a "real-world" field-based project designed to integrate knowledge and apply skills gained through this Geography B.S. track. Course will focus on different problems each semester. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; GEOG F341; GEOS F378; senior standing in Geography; or permission of instructor. Recommended: GEOG F411.*** (3+3)

GEOG F490 W,O **Geography Seminar** (s)
3 Credits Offered Spring
Discussion of geographic thought including past, present and future directions of the discipline. Contributions of geography to science, philosophy and ethics integrated through detailed review of contemporary literature and research. ***Prerequisites: COMM F131X or F141X; ENGL F111X; ENGL F211X or ENGL F213X; senior Geography major; permission of instructor.*** (3+0)

GEOG F627 **Polar Geography**
3 Credits Offered Spring
Comparative physical, cultural, political and economic geography of the circumpolar north and antarctic regions. Special attention given to arctic natural resource development and climate change in both polar regions. ***Prerequisites: GEOG F101 or GEOG F203 or GEOG F111X; or permission of instructor.*** Cross-listed with NORS F627. Stacked with GEOG F427; NORS F427. (3+0)

GEOG F663 **Wilderness Concepts**
3 Credits Offered Fall
History and evolution of wilderness thought, the contemporary meaning of wilderness, and survey of economic and noneconomic wilderness values for individuals and society. Cross-listed with NRM F663. Stacked with GEOG F463; NRM F463. (3+0)

GEOG F692 **Graduate Seminar**
1-6 Credits
Topics in natural resources management and geography explored through readings, student presentations, group discussions and guest speakers. ***Prerequisites: Graduate standing or permission of instructor.*** (0+0)

GEOLOGICAL ENGINEERING

GE F101 **Introduction to Geological Engineering**
1 Credit
Multiple aspects of geological engineering as a profession; the area and scope of the field. Graded Pass/Fail. (1+0)

GE F261 **General Geology for Engineers**
3 Credits
Study of common rocks and minerals, landforms and erosion. Geologic materials and engineering application of geology. ***Prerequisites: Geology, science, or engineering majors, or permission of instructor.*** (3+0)

GE F322 **Engineering Sedimentology**
3 Credits Offered Spring or As Demand Warrants
Sediment types, textures, sedimentary structures and stratigraphy of sedimentary rocks; their origin through weathering, erosion, transportation and deposition mechanics and diagenesis; and engineering construction in sedimentary formations. ***Prerequisites: GE F261; PHYS F212X.*** (3+0)

GE F365 **Geological Materials Engineering**
3 Credits
Identification and classification of soils, physical and mechanical properties of soil, interaction of soils with subsurface water, subsurface exploration and case studies with an emphasis on permafrost. ***Prerequisites: ES F208; GE F261; or permission of instructor.*** (2+3)

GE F372 **Rock Engineering**
3 Credits
Rock engineering related to tunnels, slope design and strata control. Some field work and student report. ***Prerequisites: GEOS F101X or GE F261; ES F208 or ES F209.*** (3+0)

GE F375 **Principles of Engineering Geology and Terrain Analysis**
3 Credits
Evaluation of terrain characteristics using basic geomorphic and engineering principles. Alaskan applications are provided due consideration. ***Prerequisites: GE F261.*** (3+0)

GE F376 **GIS Applications in Geological and Environmental Engineering**
3 Credits
Fundamentals, concepts and components of geographic information systems (GIS) in engineering design. Introduction to acquiring, manipulating and analyzing digital terrain data for geological engineering and environmental applications, and the assessment to mineral resources. Group projects on path and site selection for engineering projects are required. ***Prerequisites: GE F261 or equivalent. Recommended: NRM F338.*** (2+3)

GE F378 **Introduction to Geoinformatics**
3 Credits Offered Spring
A multidisciplinary course providing theoretical understanding and hands-on experience with acquiring field data using palmtops and hand-held GPS; processing of remote sensing data acquired from airplanes and satellites; concept of data integration in GIS mode; database management; and cartographic visualization of final product. ***Prerequisites: PHYS F103X or PHYS F211X or permission of instructor.*** Cross-listed with GEOS F378. (2+3)

GE F381 W **Field Methods and Applied Design I**
2 Credits
Techniques and geologic mapping and geotechnical instrumentation applied to engineering design and resource evaluation. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; GE F261; GEOS F213; GEOS F214; GEOS F322; GEOS F332 or equivalent.*** (0+9+3)

GE F382 W **Field Methods and Applied Design II**
4 Credits
Techniques and geologic mapping and geotechnical instrumentation applied to engineering design and resource evaluation. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; GE F261; GEOS F213; GEOS F214; GEOS F322; GEOS F332 or equivalent.*** (0+9)

GE F384 **Engineering Geology of Alaska**
4 Credits
A survey of the geology of Alaska relevant to the definition of natural and human-induced geological engineering hazards, the evaluation of sources of and specifications for engineering materials, and the evaluation of engineering construction sites. ***Prerequisites: Upper-division standing; permission of instructor.*** (3+1+2)

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GE F400 Geological Engineering Internship
1-3 Credits
Supervised work experience in engineering organizations. Assignments will be individually arranged with cooperating organizations from the private and public sectors. A report of activities must be completed and reviewed by the sponsoring organization. The report may be held in confidence at the request of the sponsoring organization. Graded Pass/Fail. ***Prerequisites: Upper-division standing; permission of instructor.*** (1-3+0)

GE F405 Exploration Geophysics
3 Credits
Theory and application of gravity, magnetic, electrical, electromagnetic, radioactive and seismic methods as used for geophysical exploration. Some field work. ***Prerequisites: GE F375; MATH F200X; PHYS F211X or equivalent.*** (2+3)

GE F420 Subsurface Hydrology
3 Credits
Hydrologic, geologic and other factors controlling groundwater flow, occurrence, development, chemistry and contamination. Elementary groundwater flow theory. Interactions between surface-subsurface hydrologic systems. Hydraulic characteristics of earth materials, engineering problems and models related to subsurface fluids, and properties of water. ***Prerequisites: GE F365; MATH F302; PHYS F211X; or permission of instructor.*** Stacked with GE F610. (2+3)

GE F422 Unsaturated Soil Geoengineering
3 Credits
Fundamentals of soil physical processes, multiphase flow and transport in unsaturated porous media such as soils. Application of principles of unsaturated flow to geoenvironmental and geotechnical systems. Methods for characterization of hydraulic properties in relation to soil physical parameters in the context of geoengineering problems of flow and stability. Non-isothermal flow in unsaturated soils and its impact on subsurface environment. Biogeochemical processes affecting soil and groundwater contamination. Unsaturated flow and transport modeling including heat transfer relevant to active layer dynamics and permafrost underlain soils in Alaska and other similar cold regions. ***Prerequisites: GE F420 or equivalent course; or permission of instructor.*** Stacked with GE F622. (3+0)

GE F430 Geomechanical Instrumentation
3 Credits
Measurement of groundwater pressure, ground deformation, stress and temperature as well as the planning of monitoring programs, instrument calibration, maintenance and installation, data collection, interpretation, and reporting. Case histories are used. ***Prerequisites: ES F331; GE F261 or GEOS F101X.*** (3+0)

GE F431 Applied Ore Microscopy
2 Credits
Preparation of polished sections of ores. Identification of ore materials in reflected light by physical, optical and chemical methods. Applications to ore genesis, drill core interpretation, beneficiation and process control. ***Prerequisites: Permission of instructor.*** (1+3)

GE F435 Exploration Design
3 Credits
Geologic, engineering and economic considerations applied to the design and development of mineral exploration programs. ***Prerequisites: GEOS F314 or permission of instructor.*** (3+0)

GE F440 Slope Stability
3 Credits
Slope design for open pit mining and other excavations. Stability analysis by various methods and on-site measuring and monitoring techniques. ***Prerequisites: ES F331.*** (3+0)

GE F441 Geohazard Analysis
3 Credits
Procedures and techniques to evaluate geological factors for geohazards, such as landslides, earthquakes, volcanoes, flooding, coastal hazards and permafrost-related problems. ***Prerequisites: GE F365 or equivalent; or permission of instructor.*** (3+0)

GE F471 Remote Sensing for Engineering
3 Credits
Applications of remote sensing to geological engineering problems. Introduction to digital satellite image processing with hands-on practice. ***Prerequisites: GE F375 or permission of instructor; PHYS F212X.*** (2+3)

GE F480 W Senior Design
3 Credits
Design factors and procedures for the solution of geological engineering problems. A design project is the focus of the course. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; senior standing in the geological engineering program with completion of GE F261; GE F365; GE F375; GE F381 or equivalent; GE F382 or equivalent; GE F405; GE F420; GE F471.*** (1+6)

GE F610 Subsurface Hydrology
3 Credits
Hydrologic, geologic and other factors controlling groundwater flow, occurrence, development, chemistry and contamination. Elementary groundwater flow theory. Interactions between surface-subsurface hydrologic systems. Hydraulic characteristics of earth materials, engineering problems and models related to subsurface fluids, and properties of water. ***Prerequisites: GE F365; MATH F302; PHYS F211X; or permission of instructor.*** Stacked with GE F420. (2+3)

GE F620 Subsurface Hydrology
3 Credits Offered Fall Odd-numbered Years or As Demand Warrants
Hydrologic, geologic and other factors controlling groundwater flow, occurrence, development, chemistry and contamination. Elementary groundwater flow theory. Interactions between surface-subsurface hydrologic systems. Hydraulic characteristics of earth materials, engineering problems and models related to subsurface fluids and properties of water. ***Prerequisites: Graduate standing in Engineering or permission of instructor.*** (2+3)

GE F622 Unsaturated Soil Geoengineering
3 Credits Offered as Demand Warrants
Fundamentals of soil physical processes, multiphase flow and transport in unsaturated porous media such as soils. Application of principles of unsaturated flow to geoenvironmental and geotechnical systems. Methods for characterization of hydraulic properties in relation to soil physical parameters in the context of geoengineering problems of flow and stability. Non-isothermal flow in unsaturated soils and its impact on subsurface environment. Biogeochemical processes affecting soil and groundwater contamination. Unsaturated flow and transport modeling including heat transfer relevant to active layer dynamics and permafrost underlain soils in Alaska and other similar cold regions. ***Prerequisites: GE F620 or equivalent course; or permission of instructor.*** Stacked with GE F422. (3+0)

GE F624 Stochastic Hydrology and Geohydrology
3 Credits Offered as Demand Warrants
Overview of the stochastic methods used to study and analyze hydrolic and geohydrolic processes. Emphasis on modeling hydrolic processes using statistical methods and stochastic interplay of processes between surface and subsurface hydrology. ***Prerequisites: GE F620 or equivalent and graduate standing in Engineering; or permission of instructor.*** (3+0)

GE F626 Thermal Geotechnics
3 Credits Offered as Demand Warrants
Fundamentals of thermal regimes of soils and rocks. Thermal impact of structures on soils. Thawing of permafrost beneath roads, buildings and around

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pipelines. Natural and artificial freezing of soils. Engineering means to maintain thermal regime of soils. Thermal design considerations. Cross-listed with CE F626. (3+0)

GE F630 Advanced Applied Mining Geology
3 Credits
Investigative procedures used in mining geology from pre-production to terminal phases of an operation. Models ranging from open-pit to deep underground mining will be examined. Methods of mapping, sampling, ongoing evaluation and geotechnical aspects of water and ground control are examined. ***Prerequisites: GE F435.*** (2+3)

GE F631 Electron Microprobe Methods
3 Credits
Applications of electron microanalysis to mineralogy, petrology and mineral exploration development, evaluation and processing. Physics of x-rays, x-ray spectrometry and measurement; qualitative and quantitative elemental analysis using wave length and energy dispersive spectra. ***Prerequisites: Graduate standing.*** (2+3)

GE F633 Fluid Inclusion Methods in Mineral and Petroleum Exploration
3 Credits
Study of fluid inclusions in minerals. Thermodynamics, chemical and physical properties of fluids trapped in rock forming minerals or petroleum-bearing rocks. Laboratory work includes sample preparation, thermometric and direct-current plasma emission spectrographic analysis. ***Prerequisites: CHEM F331.*** (2+3)

GE F635 Advanced Geostatistical Applications
3 Credits
Introduction to the theory and application of geostatistics. Review of classical statistics, continuous and discrete distributions, hypothesis testing and global estimation. Presentation of fundamental geostatistical concepts including: variogram, estimation variance, block variance, kriging, geostatistical simulation. Emphasis on the practical application of geostatistical techniques. ***Prerequisites: MIN F408 or equivalent; graduate standing; or permission of instructor.*** Cross-listed with MIN F635. (2+3)

GE F649 Hazardous and Toxic Waste Management
3 Credits Offered Fall Odd-numbered Years
Course provides in-depth coverage of hazardous and toxic substance management including legal, economic and technical issues. Topics will include characterization of hazardous materials, economics of toxics minimization, hazardous materials use, storage and disposal, technical aspects of landfill siting, and selection and design of treatment technologies. Includes case studies of current waste management issues. ***Recommended: Bachelor's degree in science or engineering.*** Cross-listed with ENVE F649. (3+0)

GE F665 Advanced Geological Materials Engineering
3 Credits
In-depth study of geological materials (aggregates — sand, gravel and crushed rock for construction purposes) exploration, evaluation, testing and production. Emphasis placed on geological materials used for construction in arctic and sub-arctic environments, economic analysis of pit and quarry operations and availability of materials in Alaska. ***Prerequisites: GE F365 or equivalent; permission of instructor. Recommended: MIN F408.*** (3+0)

GE F666 Advanced Engineering Geology
3 Credits
The interaction between geology and engineering case histories. ***Prerequisites: GE F365; GE F372; graduate standing; or permission of instructor.*** (2+3)

GE F668 Tunneling Geotechniques
3 Credits
Tunnel design, case histories, student report. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

GE F671 Engineering Application of Digital Image Processing
3 Credits
Quantitative methods of using digital image processing and engineering information system. Applications include, but are not limited to, evaluation of the engineering properties of geo-materials, characterization of joint-surface conditions, enhancement of photoelastic stress patterns and identification of critical slope failure surfaces. ***Prerequisites: GE F471 or equivalent or permission of instructor.*** (3+0)

GE F692 Graduate Seminar
1 Credit
Topics in geological engineering explored through talks, group discussions and guest speakers with a high level of student participation. Graded Pass/Fail. ***Prerequisites: Graduate standing or permission of instructor.*** (1+0)

GEOSCIENCE (GEOLOGY AND GEOPHYSICS)

A per semester fee for computing facilities will be assessed for one or more GEOS courses at the F200 level and above. This fee is in addition to any materials fees.

GEOS F100X Introduction to Earth Science (n)
4 Credits Offered as Demand Warrants
Survey of four main disciplines of earth science: geology, oceanography, meteorology, and astronomy. Lab portion serves as a: vehicle to learn scientific methodology, evidence to support theories presented in lectures. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+3)

GEOS F101X The Dynamic Earth (n)
4 Credits
Physical geology: a study of the Earth, its materials, and the processes that effect changes upon and within it. Laboratory training in use of topographic maps and recognition of common rocks and minerals. Special fees apply. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+3)

GEOS F106X Life in the Age of Dinosaurs (n)
4 Credits Offered Spring Even-numbered Years
Promote a broader understanding of deep time through an examination of life and environments during the Mesozoic, or "Age of Dinosaurs". Discussions and exercises will focus on major events and processes that shaped the physical environments of the Mesozoic, such as the formation and break up of continents, global climate, and changing sea levels. Building on this foundation, the course will examine the fossil record to learn what it reveals about the major patterns in the diversity of terrestrial and marine life. Special emphasis will be placed on the origin, extinction, and paleobiology of dinosaurs. Important groups of contemporary vertebrates and invertebrates, including marine reptiles, mammals, flying reptiles, and ammonites will also examined. The rise of flowering plants and the importance of fossil floras in understanding Mesozoic climates will be explored. Labs will provide opportunities to examine and identify fossils and use them to reconstruct ancient environments. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105X or higher; or permission of instructor.*** (3+3)

GEOS F112X The History of Earth and Life (n)
4 Credits Offered Spring
Historical geologic interpretation, geologic time scale, stratigraphic record and interpretation. Sedimentation and plate tectonics, fossil record and utilization, biostratigraphy, and geologic evolution of the North American continent. Lab examination of fossils, interpretation of geologic maps and stratigraphic columns. Special fees apply. ***Prerequisites: GEOS F101X; placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+3)

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GEOS F120X **Glaciers, Earthquakes, and Volcanoes: Past, Present, and Future** (n)
4 Credits
A survey course for the nonspecialist on the causes, effects, measurements and prediction of glaciers, earthquakes and volcanoes. Special fees apply. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (4+0)

GEOS F125X **Humans, Earth, and the Environment** (n)
4 Credits Offered Spring
Application of principles of the geological sciences to understanding the relationship of humans to the earth system. Investigation of geologic hazards, including prediction and mitigation, use and distribution of vital resources such as soil, water, minerals, and fossil and alternative fuel sources, especially with respect to Alaska's environment. Earth's atmospheric, oceanic and biotic systems examined in light of recent developments in global environmental change from both a modern and geologic perspective. Special fees apply. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+3)

GEOS F212 **Geology of Alaska**
3 Credits Offered as Demand Warrants
Modern geologic processes in Alaska as a basis for understanding past geologic evolution of the region. The origin and recovery of Alaska's petroleum and mineral resources will be discussed. For non-majors. Special fees apply. ***Prerequisites: GEOS F101X or permission of instructor.*** (3+0)

GEOS F213 **Mineralogy** (n)
4 Credits Offered Fall
Mineral chemistry, atomic structure, elementary crystallography, optical crystallography and descriptive and determinative mineralogy. Instrumental determinative techniques (x-ray diffraction, petrographic microscope). Special fees apply. ***Prerequisites or co-requisites: CHEM F105X; GEOS F101X; MATH F107X.*** (2+6)

GEOS F214 **Petrology and Petrography** (n)
4 Credits Offered Spring
Origin, occurrence and classification of igneous, sedimentary and metamorphic rocks. Laboratory work involves hand lens identification and thin section examination of representative rocks. Special fees apply. ***Prerequisites: GEOS F213.*** (2+6)

GEOS F225 **Field and Computer Methods in Geology**
2 Credits
Basic field methods, including field notes, topographic maps, measurement of structural elements, field safety, illustration, field mapping, and the use of GPS for field work are discussed and practiced. Use of computers for processing geologic field data and analytical data, and integration of field data into a simple Geographic Information System. Computers are used for the production of reports and technical illustration. This course will fulfill the department requirement for computer literacy. Special fees apply. ***Prerequisites: GEOS F101X.*** (1+3)

GEOS F262 **Rocks and Minerals**
3 Credits Offered Fall Even-numbered Years
Physical properties of minerals and rocks, classification, mode of occurrence and economic applications. Role of rock materials in soil formation and fluid flow; influence on economic deposits and construction. Labs on recognition and measurement of physical properties. Course may not be used to satisfy degree requirements in geology or geological engineering. Special fees apply. ***Prerequisites: GE F261, GEOS F101X or equivalent.*** (2+3)

GEOS F304 **Geomorphology**
3 Credits Offered Fall
Surface features of the Earth and the processes which create or modify them. Application to Quaternary history, environmental science and related fields. Laboratory examination of topographic maps and aerial photographs, introduction to geomorphic measurements. Special fees apply. ***Prerequisites: GEOS F101X.*** (3+0)

GEOS F314 **Structural Geology** (n)
4 Credits Offered Spring
Introductory overview of how rocks are deformed, types of geological structures including folds, faults and penetrative fabrics, and the associations of structures characteristic of different tectonic settings. Provides background in structural geology. Emphasis in the laboratory on examples and techniques that are broadly applicable in geology, especially the interpretation of geologic maps. Special fees apply. ***Prerequisites: GEOS F322 or concurrent enrollment in GEOS F214; PHYS F103X or PHYS F211X.*** (3+3)

GEOS F315 W **Paleobiology and Paleontology** (n)
4 Credits Offered Fall
Survey of the history of life on Earth as represented in the fossil record. Contribution of paleontology to the study of evolution, past environments and paleogeography; biostratigraphically important invertebrate fossil groups and their temporal ranges; evolution of terrestrial flora and fauna; current issues in paleontology. Emphasis on recognition of major fossil groups and paleontological problem solving in labs and assignments. Special fees apply. ***Prerequisites: BIOL F103X or BIOL F115X or GEOS F112X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** (3+3)

GEOS F322 **Stratigraphy and Sedimentation** (n)
4 Credits Offered Fall
Analysis and interpretation of sedimentary rocks in stratigraphic successions based on comparison with features found in modern depositional environments. Application of the principles of facies analysis and litho-, bio-, sequence, and chronostratigraphy in surface and subsurface examples. Emphasis in the laboratory on interpretation of depositional environments based on lithofacies, biofacies and sedimentary structures and correlation of stratigraphic sequences using surface and subsurface data. Special fees apply. ***Prerequisites: GEOS F101X or GE F261; GEOS F112X.*** (3+3)

GEOS F332 **Ore Deposits and Structure**
3 Credits Offered Spring
Distribution and characteristics (especially mineralogy, morphology, and structure) of major mineral deposit types with background on structural techniques. Emphasis on application to mineral exploration and development. Laboratory exercises stress recognition of major mineral deposit types, zoning and grade patterns; and use of structural techniques in mineral deposit exploration/development. Special fees apply. ***Prerequisites: GEOS F262 or permission of instructor.*** (1+6)

GEOS F351 W **Field Geology** (n)
8 Credits Offered Summer Odd-numbered Years; As Demand Warrants
Practical experience in a variety of field settings collecting and presenting basic geologic field data. Includes field mapping of stratigraphic and structural problems using topographic maps, airborne and satellite images. Students will prepare geologic maps in a variety of tectonic and lithologic settings and develop written reports detailing the geologic history for several study areas. Exercises in collection and use of geophysical data as an aid to geologic mapping. Hiking off trails in a variety of terrains with up to 2,000 vertical feet of elevation gain per day. Course fees cover transportation and subsistence outside of Fairbanks. Entrance by preregistration only; apply through the department. Early registration recommended. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; GEOS F214; GEOS F225; GEOS F314; GEOS F322; junior standing; permission of instructor.*** (8+0)

GEOS F370 **Sedimentary and Structural Geology for Petroleum Engineers** (n)
4 Credits Offered Fall Odd-numbered Years
Origin and distribution of sedimentary rocks including depositional environments, stratigraphic relationships and structures. Emphasis on the relationship to petroleum occurrences and petroleum exploration. Laboratory exercises on mapping, structural problems and facies relationships in petroleum exploration. Special fees apply. ***Prerequisites: GEOS F101X or GE F261.*** Cross-listed with PETE F370. (3+3)

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GEOS F401 **Invertebrate Paleontology** (n)
3 Credits Offered Fall Even-numbered Years
Study of invertebrate phyla with extensive geologic records. Emphasis on principles of biostratigraphy and paleoecology, application to geologic problems and case studies from Alaska. Laboratory study of fossil assemblages with emphasis on stratigraphically significant groups. Designed to complement GEOS F322. Special fees apply. ***Prerequisites: GEOS F315 or permission of instructor. Recommended: GEOS F322.*** (2+3)

GEOS F406 **Volcanology**
3 Credits Offered Spring Even-numbered Years
Physical processes of volcanism. Topics include physical properties of magmas, eruption mechanisms, deposition mechanism and volcanic hazards. Emphasis on explosive volcanism and its products, pyroclastic rocks. Geochemistry and petrology will not be emphasized in this course. ***Prerequisites: Permission of instructor.*** (3+0)

GEOS F408 **Photogeology** (n)
2 Credits Offered Spring Even-numbered Years
Use of topographic maps, geologic maps, aerial photographs and satellite imagery in interpretation of geological structures, landscapes, landforms and geomorphic processes. Techniques included are map compilation, photo mapping, statistical treatment of map data and composite mapping for planning. Special fees apply. ***Prerequisites: GEOS F304 or permission of instructor.*** (1+3)

GEOS F416 **Applied Geophysics** (n)
3 Credits Offered Spring Even-numbered Years
Introduction to the theory and practice of geophysical techniques and the interpretation and modeling of geophysical data. Topics include: gravity, GPS, magnetic seismic, and electrical methods and their application to regional and local geophysical exploration in Alaska. Special fees apply. ***Prerequisites: GEOS F418 or permission of instructor.*** (2+3)

GEOS F417 **Introduction to Geochemistry**
3 Credits Offered Fall
Application of chemical principles and elemental/isotopic behavior to the study of the Earth. Topics include: aqueous geochemistry, high-temperature mineral-elemental chemistry, isotopic chemistry, kinetics and thermochemistry. ***Prerequisites: CHEM F106X; GEOS F322 or CHEM F202.*** Stacked with GEOS F618. (3+0)

GEOS F418 **Basic Geophysics**
3 Credits Offered Fall
Concepts and techniques of geophysics including origin of the Earth, its structure, and large scale dynamic processes responsible for its surface features. Geophysical techniques including seismology, gravity, magnetometry and electrical methods discussed along with measurements of the earth's thermal structure, rotation rates, and tide effects. ***Prerequisites: MATH F200X; PHYS F104X; or permission of instructor.*** (3+0)

GEOS F421 **Sedimentology**
3 Credits Offered Spring Odd-numbered Years
Origin, classification, composition, transportation, deposition and diagenesis of sediments. Emphasis on sedimentary processes, sedimentary petrology and interpretation of ancient sedimentary rocks. Laboratory covers identification and description of hand specimens as well as techniques of textural and compositional analysis. Special fees apply. ***Prerequisites: GEOS F213 or permission of instructor.*** (2+3)

GEOS F422 **Geoscience Applications of Remote Sensing** (n)
3 Credits Offered Fall
Remote sensing and its applications to geologic, environmental and physical sciences. Includes nomenclature, a review of sensing systems and forms in which data is available. Emphasis on use of LANDSAT, radar imagery, thermal imagery and color infrared photograph. ***Prerequisites: PHYS F104X or PHYS F212X; junior standing; or permission of instructor.*** (2+3)

GEOS F428 **Elementary Scanning Electron Microscopy**
1 Credit Offered Spring
Basic theory and operating procedures for scanning electron microscopy. Includes sample preparation, imaging and qualitative elemental analysis. Biological and nonbiological applications are covered. Graded Pass/Fail. Special fees apply. ***Prerequisites: Junior standing or permission of instructor.*** Stacked with GEOS F628. (0.5+1.5)

GEOS F430 **Statistics and Data Analysis in Geology**
3 Credits Offered Spring
Computer-supported geologic applications of elementary statistics, Markov chains, time-series analysis, trend-surface analysis, factor analysis, cluster analysis, discriminant analysis, and multiple regression. ***Prerequisites: GEOS F225; STAT F200X.*** (3+0)

GEOS F434 **Remote Sensing of the Cryosphere** (n)
4 Credits Offered Spring Odd-numbered Years
Survey of remote sensing methods for mapping and monitoring the various components of the cryosphere. Focus is on the application of optical and microwave satellite data for the study of snow, lake ice and frozen ground. Demonstration and use of field techniques and image analysis software. ***Prerequisites: GEOS F422 or equivalent.*** Stacked with GEOS F634. (3+3)

GEOS F438 **Basin Analysis**
3 Credits Offered Spring Odd-numbered Years
Examines sedimentary basins as a record of subsidence. Review and discuss techniques used to image basin stratigraphy as well as the quantitative techniques which can be used to recover basin history. ***Prerequisites: GEOS F322 or GEOS F370. Recommended: GEOS F314; GEOS F416; GEOS F418.*** Stacked with GEOS F638. (3+0)

GEOS F452 **Quaternary Seminar**
3 Credits Offered as Demand Warrants
Learning about the Quaternary Period (relatively recent past — spanning the past two million years) in order to gain a better understanding of the landscape, biota and climate of the present day. Quaternary studies are concerned with the historical dimension of the natural sciences. This seminar will range widely over diverse interdisciplinary subjects of Quaternary interest, such as paleoclimatology, paleobiogeography, vertebrate paleontology and sedimentology. ***Prerequisites: GEOS F304; GEOS F315; GEOS F322.*** Cross-listed with ANTH F451. Stacked with GEOS F651; ANTH F651. (3+0)

GEOS F453 **Palynology and Paleopalynology** (n)
4 Credits Offered Fall Even-numbered Years
Survey of the evolutionary record of palynomorphs and their uses in biostratigraphy and paleoclimatology. Focus on evolution of palynomorphs from Precambrian to the present and concurrent evolutionary developments of producing plants. Use of Quaternary palynofloras in reconstructing global climates. Labs involve collection of herbarium specimens, processing of fossil palynomorphs, study of type slides and a survey of palynofloras from each geologic period. Special fees apply. ***Prerequisites: BIOL F115X or GEOS F315; senior standing.*** Stacked with GEOS F653. (3+3)

GEOS F456 **Paleopedology**
3 Credits Offered Fall Even-numbered Years
A survey course focusing on the recognition and use of paleosols (fossil soils) as paleoenvironmental indicators, stratigraphic markers and in paleogeographic reconstructions from Precambrian to Holocene. Examination of theories of soil formation, major soil processes and approaches to soil classification. Review of geochemical, mineralogical, morphological and micromorphological techniques. Use of paleosols for paleolandscape evolution and basin analysis. Geological, tectonic, archaeological and environmental applications of paleosols are discussed. ***Prerequisites: GEOS F322 or GEOG F111 or NRM F380 or permission of instructor.*** Stacked with GEOS F656. (3+0)

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GEOS F458 **Geoscience Applications of GPS and GIS** (n)
3 Credits Offered Spring
Aspects of GPS data collection, including hands-on experience with different GPS units, differential GPS methods, real-time and post processing corrections. Concepts of Geographic Information Systems (GIS). Working with real-world data and software tools such as Excel spreadsheets and ArcGIS, students will learn to organize and integrate multisource data, analyze spatial relationships and generate maps for digital and print media. Course is not available for audit. ***Prerequisites: GEOS F225 or permission of instructor. Recommended: MATH F107X; MATH F200X.*** Stacked with GEOS F658. (2+3)

GEOS F463 O **Glacial and Periglacial Geology** (n)
4 Credits Offered Fall Odd-numbered Years
Glaciers and their geological processes. Emphasizes recognition and understanding of glacial landforms, sediments and stratigraphic relations, and implications for paleoclimatology and paleogeography. Includes non-glacial techniques and methods for interpreting Quaternary sediments. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; GEOS F304.*** Stacked with GEOS F663. (3+3)

GEOS F465 **Geoarchaeology**
3 Credits Offered as Demand Warrants
Geological context of archaeological sites and the geologic factors that affect their preservation, with emphasis on Alaska. Includes a one or two-day weekend field trip in late April or early May. Special fees apply. ***Prerequisites: GEOS F101X; an introductory course in archaeology; or permission of instructor.*** Cross-listed with ANTH F465. (3+0)

GEOS F475 W,O **Presentation Techniques in the Geosciences**
2 Credits Offered Spring
Instruction and practice in oral and written communication skills specifically related to the geosciences. Oral and written presentation of abstracts, resumes, proposals and reports required. Works critically analyzed by instructor(s) and peers for both geoscience content and communication effectiveness. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; senior standing.*** Stacked with GEOS F675. (1+3)

GEOS F482 **Geology Seminar**
1 Credit
A weekly seminar series on a geologic theme of current interest for a complete semester. Stacked with GEOS F682. (1+0)

GEOS F486 **Vertebrate Paleontology** (n)
3 Credits Offered Spring Odd-numbered Years
The study of vertebrate evolution through geologic time. Covers the temporal range, diversity and systematics of major vertebrate groups as documented in the fossil record, with an emphasis on current problems in vertebrate evolutionary pattern and process. Labs emphasize comparative morphology and identification of major vertebrate groups. ***Prerequisites: BIOL F310 or BIOL F317 or GEOS F315 or permission of instructor.*** Cross-listed with BIOL F486. Stacked with GEOS F686; BIOL F686. (2+3)

GEOS F488 **Undergraduate Research**
1-3 Credits
Advanced research topics from outside the usual undergraduate requirements. ***Prerequisites: Permission of instructor. Recommended: A substantial level of technical/scientific background.*** (1-3+0)

GEOS F600 **Introduction to X-ray Spectrometry**
3 Credits Offered Fall
Theory of X-ray spectrometry, qualitative and quantitative elemental analysis. Mechanics of electron, microprobe and X-ray fluorescence analysis. Applicable to geologic, materials science and biologic samples. Required for use of the microprobe at UAF. Special fees apply. ***Prerequisites: PHYS F212X; STAT F300; GEOS F417; graduate standing in the sciences or engineering; or permission of instructor.*** (2+3)

GEOS F602 **Geophysical Fields**
3 Credits Offered Spring Odd-numbered Years
Introduction to the application of potential theory and its associated mathematical tools to fields of geophysical interest, namely gravity, magnetics, and heat flow. Emphasis will be placed on methods and tools for solving a variety of problems in global and regional geophysics, and the geophysical interpretation of solutions. ***Prerequisites: MATH F421 and MATH F422 and permission of instructor; or graduate standing.*** (3+0)

GEOS F603 **Advanced Field Mapping**
1-2 Credits Offered as Demand Warrants
Practical experience in advanced field mapping techniques with accompanying instruction in the regional and local geology of the study area. Special fees apply. ***Prerequisites: GEOS F351.*** (0+1-3+3)

GEOS F604 **Intermediate Seismology**
3 Credits Offered Spring Even-numbered Years
Sources of ground motion including focal mechanisms, magnitude and propagation of waves within the earth. Measurement of seismic data by analog and digital techniques and subsequent treatment of seismic data by various techniques including inversion. (3+0)

GEOS F605 **Geochronology**
3 Credits Offered Fall Even-numbered Years
Application of the most commonly used radiometric dating methods to geologic problems. Fundamentals of the K-Ar, Rb-Sr, fission-track, U-Th-Pb and C methods. Laboratory training in K-Ar and fission-track dating techniques. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

GEOS F606 **Volcanology**
3 Credits Offered Fall Odd-numbered Years
Physical processes of volcanism. Topics include physical properties of magmas, eruption mechanisms, deposition mechanism and volcanic hazards. Emphasis on explosive volcanism and its products, pyroclastic rocks. Geochemistry and petrology will not be emphasized in this course. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

GEOS F611 **Advanced Structural Geology and Tectonics**
3 Credits Offered Fall Even-numbered Years
An advanced course providing an in-depth treatment of specific aspects of structural geology and tectonics. Topics to be considered in different semesters include tectonics and sedimentation, mountain belts of the world, structural analysis, structural geology of a specific tectonic setting (such as fold-and-thrust belts or rifts), (E) active tectonics and topography, (F) structural interpretation of seismic reflection data, and (G) other special topics in structural geology or tectonics. ***Prerequisites: GEOS F314; graduate standing; or permission of instructor. Note: Course may be repeated for different topics up to three times for credit.*** (3+0)

GEOS F612 **Geologic Evolution of Alaska**
3 Credits Offered Fall Even-numbered Years
An overview of the geological provinces of Alaska and neighboring continental and oceanic regions. Emphasis will be on the geologic history and tectonic evolution of Alaska. ***Prerequisites: GEOS F314 and GEOS F322; OR graduate standing.*** (3+0)

GEOS F613 **Global Tectonics**
3 Credits Offered Fall Odd-numbered Years
An advanced course dealing with tectonic theory. Emphasis on plate tectonics with discussions of the evidence supporting the plate hypothesis and the interaction of plates both past and present. ***Prerequisites: GEOS F314 and GEOS F322; OR graduate standing.*** (3+0)

GEOS F614 **Ice Physics**
3 Credits Offered Spring Even-numbered Years
A survey of the physics of ice. Topics will include the crystal structure and properties of ice, high pressure phases, hydrogen bonding, mechanical, thermal, electrical and acoustic properties, nucleation and growth, and optical

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and surface properties (adhesion, friction). ***Prerequisites: MATH F421 and MATH F422 and permission of instructor; OR graduate standing.*** Cross-listed with PHYS F614. (3+0)

GEOS F615 Sea Ice
3 Credits Offered Fall Even-numbered Years
A study of sea ice in the natural environment including sea ice properties and processes on the micro-scale and the macro-scale, freezing processes and sea ice growth, ice decay and ice dynamics. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

GEOS F616 Permafrost
3 Credits Offered Spring Odd-numbered Years
Study of the occurrence, thickness, environmental problems, and mass and energy transport of permafrost, including soil and ice interaction, freezing and thawing processes, and mechanical and electrical properties and processes. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

GEOS F617 Glaciers
3 Credits Offered Fall Odd-numbered Years
The mechanisms responsible for the existence, motion and variations of present-day glaciers and ice sheets, the paleoclimate information they contain and their role in engineering hydrology. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

GEOS F618 Introduction to Geochemistry
3 Credits Offered Fall
Application of chemical principles and elemental/isotopic behavior to study of the Earth. Topics include: aqueous geochemistry, high-temperature mineral-elemental chemistry, isotopic chemistry, kinetics and thermochemistry. ***Prerequisites: CHEM F106X; GEOS F322 OR CHEM F331 and CHEM F332; graduate standing.*** Stacked with GEOS F417. (3+0)

GEOS F619 Advanced X-ray Spectroscopy
2 Credits Offered as Demand Warrants
Advanced X-ray techniques. Topics include preparation of unusual samples, quantification methods, x-ray mapping and classification, and error analysis. Each student will develop a project to explore the the limits of x-ray analysis. Note: Course may be repeated three times for credit. Special fees apply. ***Prerequisites: GEOS F600 or permission of instructor.*** (1+3)

GEOS F620 Geodynamics
3 Credits Offered Fall Even-numbered Years
Applications of continuum mechanics and heat flow theory to geophysical, geologic and glaciological problems. Topics such as postglacial rebound, non-Newtonian fluid flow, thermal convection, stress-relaxation and the rheology of earth materials will be discussed. ***Prerequisites: MATH F421 and MATH F422 and permission of instructor; OR graduate standing.*** (3+0)

GEOS F621 Advanced Petrology
4 Credits Offered as Demand Warrants
A detailed treatment of various aspects of petrology. Specific topics to be considered in different semesters include metamorphic petrology, igneous petrology, and igneous and metamorphic petrography. Each time the course is offered, only one topic will be presented. Special fees apply. ***Prerequisites: Graduate standing; permission of instructor.*** (3+3)

GEOS F622 Digital Image Processing in the Geosciences
3 Credits Offered Fall Odd-numbered Years
Image processing and analysis techniques as they relate to remote sensing and other applications in the geosciences. Apart from lectures and demonstrations, the advantages and drawbacks of different methods and approaches and their applicability to geoscience problems will be evaluated through exercises and a course project. (3+0)

GEOS F628 Elementary Scanning Electron Microscopy
1 Credit Offered Spring
Basic theory and operating procedures for scanning electron microscopy. Includes sample preparation, imaging and qualitative elemental analysis. Biological and non-biological applications are covered. Graded Pass/Fail. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with GEOS F428. (0.5+1.5)

GEOS F629 Geologic Hazards and Natural Disasters
3 Credits Offered Spring Odd-numbered Years
Examination of hazardous geologic processes which produce natural disasters, including volcanism, tectonism, flooding, etc. Includes scientific approaches to evaluating the magnitude and probability of risk from future hazardous events. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

GEOS F633 Environmental Geochemistry
3 Credits Offered Spring Even-numbered Years
Advanced topics and methods in chemistry of aquatic and soil environments. Detailed treatment of the thermodynamic, kinetic and structural principles involved in the description and modeling of low-temperature aqueous geochemical systems. Particular emphasis will be placed on heterogenous interactions, including dissolution/precipitation, sorption and microbial processes, involved in the partitioning, transformation and transport of chemical species in the environment. ***Prerequisites: ENVE F641 or GEOS F618 or permission of instructor.*** Cross-listed with CHEM F609. (3+0)

GEOS F634 Remote Sensing of the Cryosphere
4 Credits Offered Spring Odd-numbered Years
Survey of remote sensing methods for mapping and monitoring the various components of the cryosphere. Focus is on the application of optical and microwave satellite data for the study of snow, lake ice and frozen ground. Demonstration and use of field techniques and image analysis software. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with GEOS F434. (3+3)

GEOS F635 Advanced Economic Geology
1-4 Credits Offered as Demand Warrants
An advanced course providing an in-depth treatment of various aspects of economic geology. Specific topics will be considered in different semesters. They include ore microscopy, industrial minerals, economics of minerals, geochemistry of ore deposits, modern fossil fuel exploration and detailed study of particular ore deposit type. Each time the course is offered, only one topic will be presented. May be repeated for credit. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** (1-4+0-3)

GEOS F637 Rock-Forming Minerals
4 Credits Offered Spring Odd-numbered Years
Examination of the rock-forming minerals; their structure and composition. Application of mineral data to problems in geochemistry, petrology and ore deposits. Laboratory involves analysis of minerals by various analytical techniques. Special fees apply. ***Prerequisites: GEOS F417 and permission of instructor; OR graduate standing.*** (3+3)

GEOS F638 Basin Analysis
3 Credits Offered Spring Odd-numbered Years
Examines sedimentary basins as a record of subsidence. Review and discuss techniques used to image basin stratigraphy as well as the quantitative techniques which can be used to recover basin history. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with GEOS F438. (3+0)

GEOS F639 InSar and its Applications
3 Credits Offered as Demand Warrants
Introduction to the concepts of repeat-pass spaceborne SAR interferometry. Practical use of the technique to derive displacements of the solid earth, glaciers and ice sheets to a precision of a few centimeters and accurate digital elevation models of the earth's surface. ***Prerequisites: Basic remote sensing course or permission of instructor.*** Cross-listed with PHYS F639. (2+2)

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GEOS F640 Petrology of Carbonate Rocks
4 Credits Offered Spring Even-numbered Years
Origin, depositional environments, diagenesis and classification of limestones, dolostones and related rocks. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** (3+3)

GEOS F643 Sandstone Depositional Environments
3 Credits Offered Fall Even-numbered Years
Sedimentary depositional environments treating the hydrodynamics, sediment dispersal patterns and preservation potential of modern terrigenous clastic depositional environments and criteria for recognizing their ancient counterparts in the geologic record. Special fees apply. ***Prerequisites: GEOS F322 and GEOS F421; OR graduate standing.*** (3+0)

GEOS F647 Advanced Sedimentology and Stratigraphy
3 Credits Offered Spring Even-numbered Years
Various topics in sedimentology and stratigraphy. Specific offerings to be presented at various times include sequence stratigraphy and sea-level analysis, sandstone petrology, thermal maturation and geohistory analysis of sediments. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

GEOS F651 Quaternary Seminar
3 Credits Offered as Demand Warrants
Seminar about the Quaternary Period (relatively recent past — spanning the past two million years) in order to gain a better understanding of the landscape, biota and climate of the present day. Quaternary studies are concerned with the historical dimension of the natural sciences. This seminar will range widely over diverse interdisciplinary subjects of Quaternary interest, such as paleoclimatology, paleobiogeography, vertebrate paleontology and sedimentology. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with ANTH F651. Stacked with ANTH F451; GEOS F452. (3+0)

GEOS F653 Palynology and Paleopalynology
4 Credits Offered Fall Even-numbered Years
Survey of the evolutionary record of palynomorphs and their uses in biostratigraphy and paleoclimatology. Focus on evolution of palynomorphs from Precambrian to the present and concurrent evolutionary developments of producing plants. Use of Quaternary palynofloras in reconstructing global climates. Labs involve collection of herbarium specimens, processing of fossil palynomorphs, study of type slides and a survey of palynofloras from each geologic period. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with GEOS F453. (3+3)

GEOS F654 Visible and Infrared Remote Sensing
3 Credits Offered Spring Even-numbered Years
In-depth coverage of the principles, physics, sensor technology, processing and applications of remote sensing in the visible and infrared region, including but not limited to electromagnetic spectrum, radiation laws, spectral signatures, atmospheric interactions, temperature emissivity estimation, analysis and feature extraction from data sets. The laboratory part of the course will provide hands-on experience on special processing techniques, and the possibility of using these techniques for a student-defined term project in areas of geology, volcanology, glaciology, hydrology, environmental sciences, etc. ***Prerequisites: GEOS F422 or equivalent.*** (3+0)

GEOS F655 Tectonic Geodesy
3 Credits Offered Spring Even-numbered Years
Introduction to modern space geodetic methods and details their application to the study of active earth processes such as plate tectonics, fault mechanics and volcanology. Includes space geodesy methods such as global positioning system, as standard geophysical tools for the study of earthquakes, active tectonics and volcanology. ***Prerequisites: MATH F314; MATH F421; MATH F422; graduate standing; or permission of instructor.*** (3+0)

GEOS F656 Paleopedology
3 Credits Offered Fall Even-numbered Years
A survey course focusing on the recognition and use of paleosols (fossil fuels) as paleoenvironmental indicators, stratigraphic markers and in paleogeographic reconstructions from Precambrian to Holocene. Examination of theories of soil formation, major soil processes and approaches to soil classification. Review of geochemical, mineralogical, morphological and micromorphological techniques. Use of paleosols for paleolandscape evolution and basin analysis. Geological, tectonic, archaeological and environmental applications of paleosols are discussed. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with GEOS F456. (3+0)

GEOS F657 Microwave Remote Sensing
3 Credits Offered Spring Even-numbered Years
The principles and applications of active and passive microwave remote sensing with emphasis on spaceborne remote sensing of the Earth's atmosphere, land and oceans. The laboratory section will provide hands-on experience on special processing techniques, and the possibility of using these techniques for a student-defined term project in areas of geology, volcanology, glaciology, hydrology, environmental sciences, etc. ***Prerequisites: GEOS F422 or equivalent.*** (2+2)

GEOS F658 Geoscience Applications for GPS and GIS
3 Credits Offered Spring
Aspects of GPS data collection, including hands-on experience with different GPS units, differential GPS methods, real-time and post processing corrections. Concepts of Geographic Information Systems (GIS). Working with real-world data and software tools such as Excel spreadsheets and ArcGIS, students will learn to organize and integrate multisource data, analyze spatial relationships and generate maps for digital and print media. Course is not available for audit. ***Prerequisites: GEOS F225 or permission of instructor. Recommended: MATH F107X and MATH F200X.*** Stacked with GEOS F458. (2+3)

GEOS F663 Glacial and Periglacial Geology
4 Credits Offered Fall Odd-numbered Years
Glaciers and their geological processes. Emphasizes recognition and understanding of glacial landforms, sediments and stratigraphic relations, and implications for paleoclimatology and paleogeography. Includes non-glacial techniques and methods for interpreting Quaternary sediments. Special fees apply. ***Prerequisites: GEOS F304 or graduate standing.*** Stacked with GEOS F463. (3+3)

GEOS F670 Selected Topics in Volcanology
1-3 Credits Offered Fall
Survey course in subjects relating to volcanology. Possible subjects include, but are not limited to, eruption dynamics, geophysics of eruptions, volatiles in volcanic systems, modeling volcanic systems. May be repeated for credit. ***Prerequisites: GEOS F621 and GEOS F417; OR graduate standing.*** (1-3+0)

GEOS F671 Volcano Seismology
3 Credits Offered Spring Odd-numbered Years
Survey of seismic behavior of volcanoes. Topics include instrumentation, terminology, swarms and their attributes, high-frequency events, volcanic explosions, volcanic tremor, attenuation and velocity structure, cycles of activity, eruption forecasting, detection of magma chambers, case studies and selected topics. Oral and written student presentations will be required. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

GEOS F675 Presentation Techniques in the Geosciences
2 Credits Offered Spring
Development of oral and written presentation skills in the geological sciences with emphasis on the critical analysis of both peers and the instructor(s). Oral and written presentations of abstracts, resumes, proposals and reports. ***Prerequisites: Graduate standing.*** Stacked with GEOS F475. (1+3)

GEOS F676 Remote Sensing of Volcanic Eruptions
3 Credits Offered as Demand Warrants
Focuses on the use of satellite images to detect, monitor and mitigate volcanic hazards, and to understand eruption processes. Thermal anomalies, volcanic clouds and surface morphological features will be discussed in the lecture and test cases analyzed in the laboratory. Satellite data include GOES, AVHRR, MODIS, ASTER, Landsat and SAR. Course may be repeated twice for credit.

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Recommended: GEOS F422 or equivalent Remote Sensing Class or permission of instructor. (2+3)

GEOS F682 Geology Seminar
1 Credit
A weekly seminar series on a geologic theme of current interest for a complete semester. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with GEOS F482. (1+0)

GEOS F686 Vertebrate Paleontology
3 Credits Offered Spring Odd-numbered Years
The study of vertebrate evolution through geologic time. Covers the temporal range, diversity and systematics of major vertebrate groups as documented in the fossil record, with an emphasis on current problems in vertebrate evolutionary pattern and process. Labs emphasize comparative morphology and identification of major vertebrate groups. ***Prerequisites: BIOL F310 or BIOL F317 or GEOS F315 or permission of instructor.*** Cross-listed with BIOL F486; GEOS F486. Stacked with BIOL F686. (2+3)

GERMAN

GER F101 Elementary German I (h)
5 Credits
Introduction to the German language and culture: development of competence and performance in the language through understanding, recognition and use of linguistic structures; increasing emphasis on listening comprehension and speaking; basic vocabulary of approximately 1,000 words; exploration of the cultural dimension, implicitly through language, and explicitly through texts and audiovisual materials. (5+0)

GER F102 Elementary German II (h)
5 Credits
Introduction to the German language and culture: development of competence and performance in the language through understanding, recognition and use of linguistic structures; increasing emphasis on listening comprehension and speaking; basic vocabulary of approximately 1,000 words; exploration of the cultural dimension, implicitly through language, and explicitly through texts and audiovisual materials. ***Prerequisites: GER F101 or equivalent.*** (5+0)

GER F103 Conversational German I (h)
3 Credits
Oral skills improvement. Includes group work, presentations, skits, discussions and vocabulary to improve speaking on specific topics. Graded Pass/Fail. ***Prerequisites: GER F102 or equivalent or permission of instructor. Does not satisfy core curriculum or foreign language major requirements.*** (3+0)

GER F201 Intermediate German I (h)
3 Credits
Continuation of GER F102. Increasing emphasis on reading ability and cultural material. Conducted in German. ***Prerequisites: GER F102 or equivalent.*** (3+0)

GER F202 Intermediate German II (h)
3 Credits
Continuation of GER F201. Increasing emphasis on reading ability and cultural material. Conducted in German. ***Prerequisites: GER F201 or equivalent.*** (3+0)

GER F203 Conversational German II (h)
3 Credits
Oral skills improvement. Includes group work, presentations, skits, discussions and vocabulary to improve speaking on specific topics. Graded Pass/Fail. ***Prerequisites: GER F102 or equivalent or permission of instructor. Does not satisfy core curriculum or foreign language major requirements.*** (3+0)

GER F301 W,O Advanced German (h)
3 Credits
Discussions and essays on more difficult subjects or texts. Translations, stylistic exercises and special grammatical problems. Conducted in German. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; GER F202 or equivalent.*** (3+0)

GER F302 W,O Advanced German (h)
3 Credits
Discussions and essays on more difficult subjects or texts. Translations, stylistic exercises and special grammatical problems. Conducted in German. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; GER F301 or equivalent.*** (3+0)

GER F431 W Studies in the Culture of the German Speaking World (h)
3 Credits Offered Spring Even-numbered Years
Study of the cultures of the German-speaking world. Students may repeat course for credit if topic varies. Note: Course may be repeated for credit if topic varies. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; GER F301 or equivalent; junior standing; or permission of instructor.*** (3+0)

GER F432 W Studies of German Literature (h)
3 Credits Offered Spring Odd-numbered Years
Intensive study of authors, literary texts, movements, genres, themes and/or critical approaches. Student may repeat course for credit when topics vary. Note: Course may be repeated for credit if topic varies. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; GER F302 or equivalent; junior standing; or permission of instructor.*** (3+0)

GER F482 Selected Topics in German (h)
3 Credits
Intensive course focusing on topics not covered in GER F431 or GER F432. Course may be repeated for credit if topic varies. ***Prerequisites: GER F302 or equivalent; junior standing; or permission of instructor.*** (3+0)

GER F488 Individual Study: Senior Project
3 Credits
Designed to permit the student to demonstrate ability to work with the language and the culture through the analysis and presentation, in the language, of a problem chosen by the student in consultation with the department. The student must apply for senior project and submit a project outline by the end of the sixth week of the semester preceding the semester of graduation. Offered normally in the semester preceding the student's graduation. Conducted in German. ***Prerequisites: At least 10 credits in upper-division German or permission of instructor.*** (3+0)

HEALTH

HLTH F100 Medical Terminology
3 Credits
Study of medical terminology including analysis and origin of word roots, prefixes and suffixes. Understanding the word components, students will be able to build, spell and define medical words. Content will be presented by body systems focusing on terms for anatomy, diagnostic, laboratory and medical specialties. Includes use of medical dictionary, word pronunciation and abbreviations. Designed for health care professionals. (3+0)

HLTH F101 CNR — Normal Nutrition Counseling
1 Credit
First in a series of four courses examines basic applied nutrition and counseling techniques. Counseling opportunities are provided to allow students to practice skills learned in the classroom. (1+0)

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HLTH F102 CNR — Therapeutic Nutrition Counseling
1 Credit
Second in a series of four courses examines basic therapeutic knowledge and nutrition counseling techniques. Counseling opportunities are provided to allow students to practice skills learned in the classroom. Offered at the Kuskokwim Campus only. ***Prerequisites: HLTH F101 or permission of instructor.*** (1+1)

HLTH F103 CNR — Nutrition Education and Food Preservation
1 Credit
Third in a series of four courses examines methods for planning and presenting group nutrition education talks and food preservation methods. ***Prerequisites: HLTH F102 or permission of instructor.*** (1+1)

HLTH F104 CNR — Community Resources and Problem Solving
1 Credit
Fourth in a series of four courses examines community nutrition resources and methods for community nutrition problem-solving. ***Prerequisites: HLTH F103 or permission of instructor.*** (1+1)

HLTH F105 Introduction to Health Careers
2 Credits
Introduction to health careers and the psychology of patient care. Roles and responsibilities of different members/functional units of the health care team; information on related job and educational opportunities; needs and roles of health providers in rural and urban Alaska settings. ***Prerequisites: High school graduation or GED or permission of program coordinator.*** (2+0)

HLTH F106 Human Behavior in Health Care (s)
3 Credits
Discussion of general concepts in human behavior and the specialized psychological issues when dealing with patients and loved ones in health care settings. Students perform self-evaluation and survey other cultures to allow examination of perceptions, individual biases, beliefs and their impacts on behavior. (3+0)

HLTH F107 Nurse Aide Training
9 Credits
Teaches basic nursing skills necessary to assist the nurse and be an efficient health care team member. Presents positive communication skills while providing care of residents' physical and emotional needs in a variety of health care settings. Content satisfies the theory and clinical skills needed to take the State of Alaska exam to become a Certified Nurse Aide. ***Prerequisites: High school graduation or GED; 10th grade reading level by exam; or permission of instructor. Student must be in good physical condition and have the following immunizations: Hepatitis B series, two MMRs, a PPD within 3 months of the clinical component of class.*** (5+8)

HLTH F110 Professional Skills for the Workplace
2 Credits
Presents skills to ensure success for the professional secretary, receptionist, medical worker and others. Includes interview skills, business manners, customer service and dressing for success. (2+0)

HLTH F111 Personal Care Attendant Training
4 Credits
Designed to train personal care attendants in basic care necessary to assist nurses and to be efficient health care team members. It qualifies students for state certificate of completion as personal care attendants. Eighty-eight (88) hours of class, lab and clinical practice is included. Requires criminal background check. ***Prerequisites: Proof of immunity to chicken pox, MMR and Hepatitis B; negative PPD within the last year; high school graduation or GED or 10th grade reading level by exam. Students must be in good physical condition. Co-requisites: Health care provider CPR and First Aid card.*** (2.5+3)

HLTH F113 Personal Care Attendant to Nursing Assistant Bridge
5 Credits Offered as Demand Warrants
Trains personal care attendants to become Certified Nurse Assistants. Students build upon basic PCA skills and experience. Provides the additional classroom, laboratory and clinical hours necessary to sit for the state Certified Nurse Assistant exam. ***Prerequisites: High school graduation or GED; a 10th grade reading level by exam; HLTH F111 or on the job agency training plus two years experience and instructor approval. Students must be in good physical condition, have current immunizations, and health care provider CPR card.*** (3+4)

HLTH F114 Fundamentals of Anatomy and Physiology
4 Credits
Provides a basic understanding of human anatomy and physiology. Recommended for individuals interested in health careers or students desiring an introduction to anatomy and physiology prior to taking in-depth course work in this field. ***Recommended: HLTH F100; high school biology and chemistry.*** (3+3)

HLTH F116 Mathematics in Health Care
3 Credits
Practical application of mathematics in health care, including arithmetic review, percentages, interest, ratio, proportion, dimensional analysis, metric system, medication calculation, graphs, charts and measurement instruments. ***Prerequisites: DEVM F050 or placement in DEVM F060 or higher.*** (3+0)

HLTH F118 Medical Law and Ethics
2 Credits
In-depth coverage of legal and ethical issues encountered in health care settings. Students will gain a practical knowledge of legal and ethical principles and application of these principles in health care settings. (2+0)

HLTH F120 Industrial First Aid
1 Credit
Includes CPR training, control of bleeding and shock, recognizing heart problems, stroke, poisoning, sugar diabetes, epileptic seizures and dealing with major trauma injuries such as fractures, head, neck and back injuries. Also covered are hypothermia, frostbite and cold water near-drowning. Upon satisfactory completion of course, students will receive a Mines Safety Health Administration Certificate, a State Industrial First Aid Card and the American Heart Association CPR card. Graded Pass/Fail. (1+0)

HLTH F122 First Aid and CPR
1 Credit
Provides instruction on emergency first aid theory and techniques. Students acquire knowledge and skills necessary for dealing with emergencies in a medical/dental office and other clinical settings. Includes First Aid Certification and health care provider (adult, child and infant) CPR Certification. Graded Pass/Fail. (0.5+1)

HLTH F130 Medical Office Technology
3 Credits Offered Spring
Introduces current and potential health care workers to computers in the medical office. Will study medical office management software and electronic health record systems. Includes discussion of computer hardware and software, working with operating systems, keyboarding, word processing, spreadsheets, presentation creation and formatting, and database concepts. (3+0)

HLTH F132 Administrative Procedures I
2 Credits
Administrative responsibilities performed by medical/dental assistants and other health care providers in outpatient facilities. Includes duties of the office assistant, receptionist or secretary. Focus on reception, telephone procedures, public relations and professionalism. ***Prerequisites: High school graduation or GED or permission of instructor.*** (2+0)

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HLTH F135 ICD-9 Coding
3 Credits
In-depth study of the International Classification of Diseases (ICD), designed for classification of patient morbidity and mortality information for statistical purposes and for the indexing of health records for the health care profession. ***Prerequisites: HLTH F112 OR both HLTH F100 and HLTH F114.*** (3+0)

HLTH F142 Clinical Procedures I
4 Credits
Introduction to the theoretical basis and performance competencies for the clinical duties performed by medical assistants in outpatient facilities. Includes care of patients in the examining room, use and care of medical instruments and supplies, assisting physicians with clinical procedures, administering medications and introduction to clinical laboratory procedures. Special fees apply. ***Prerequisites: HLTH F100; HLTH F116. Co-requisites: HLTH F114 or BIOL F100X or permission of program coordinator.*** (3+2)

HLTH F203 Science of Nutrition
3 Credits
Introduction to the principles of nutrition and its relationship to the life cycle. Focus on the importance nutrition plays in personal health and how to objectively evaluate nutritional intake using scientifically sound resources. Also available through the Center for Distance Education. (3+0)

HLTH F208 Human Diseases
3 Credits
Introduction to the study of human diseases. Pathogenesis, etiology and predisposing factors will be examined. The most common diseases and disorders of each body system are presented along with a review of the pertinent anatomy and physiology. Includes the effects of aging on the system and the relationship of aging to disease. ***Prerequisites: HLTH F100 or permission of instructor.*** (3+0)

HLTH F234 Administrative Procedures II
4 Credits
Office management and financial procedures used in medical offices. Includes medical financial recordkeeping systems and computerized office management systems. Includes ICD-9, CPT coding system, patient insurance billing/reimbursement procedures, the demonstration of computational skills in accounts payable/accounts receivable, and office management in the health care setting. ***Prerequisites: CIOS F150; HLTH F100; HLTH F132; test scores sufficient for placement in ENGL F111X; or permission of instructor.*** (3+2)

HLTH F235 Medical Coding
4 Credits
The current procedural terminology (CPT) and the international classification of diseases (ICD) systems used in the medical setting. Examines the medical and legal uses of the CPT and ICT code systems in inpatient and outpatient medical settings, urgent care settings, billing departments and ancillary medical professions. Prepares students to take national certification exams. ***Recommended: HLTH F100; HLTH F132; HLTH F208; HLTH F234.*** (4+0)

HLTH F236 Outpatient Health Care Reimbursement
3 Credits
Outpatient reimbursement issues including documentation, insurance carriers, schedules and payment profiles. Collection strategies and legal issues, and the importance of educating the patient to the financial policies of the practice. ***Prerequisites: HLTH F132; concurrent HLTH F234; or permission of instructor.*** (3+0)

HLTH F237 Inpatient Health Care Reimbursement
3 Credits
Rules and regulations governing the reimbursement of inpatient and hospital coding. Includes HIPPA regulations, Medicare, Medicaid, third party billing, and the legal and ethical guidelines of inpatient billing. ***Prerequisites: HLTH F132; HLTH F135; HLTH F234; or permission of instructor.*** (3+0)

HLTH F244 Clinical Procedures II
4 Credits Offered as Demand Warrants
Theoretical basis and performance competencies for the clinical duties performed by medical assistants in outpatient facilities. Includes urinalysis, electrocardiograph, subcutaneous and intramuscular injections, routine laboratory procedures, venipuncture, emergencies and assisting with specialty examinations. Special fees apply. ***Prerequisites: HLTH F100; HLTH F114 or BIOL F100X; HLTH F116; HLTH F122; HLTH F142.*** (3+2)

HLTH F245 Phlebotomy Principles and Methods
3 Credits
Proper blood collection and handling techniques, function of the circulatory system, quality control in the medical laboratory, universal precautions, asepsis and disinfection, OSHA regulations, basic laboratory testing and microbiology concepts will be addressed. Completion of this course, followed by completion of the phlebotomy externship, HLTH F265, prepares students for the national ASCP phlebotomy technician certification exam. Special fees apply. ***Prerequisites: Documentation of positive antibody titer for hepatitis B; current immunization to measles, mumps, rubella, hepatitis A, varicella, and tetanus; negative TB test within the past year and departmental approval.*** (2.5+1)

HLTH F247 Introduction to Pharmacology
2 Credits
Introduction to the use of therapeutic medications in medical settings. Includes classifications of drugs, clinical use and adverse effects of the 50 most commonly prescribed medications. ***Prerequisites: HLTH F100; HLTH F114 or BIOL F100X.*** (2+0)

HLTH F261 Medical/Dental Office Reception Practicum
2 Credits Offered as Demand Warrants
Provides the student with 80 hours of practicum work in a medical or dental office, with additional time required for meeting with the campus practicum coordinator. Students will be expected to perform any and all duties of a receptionist in a medical/dental care setting. Satisfies practicum experience requirement for Medical/Dental Reception certificate. May be used to partially satisfy practicum experience requirement of Medical Assistant A.A.S. degree certificate. Graded Pass/Fail. ***Prerequisites: HLTH F122; HLTH F132; HLTH F234; enrollment by special permission only.*** (0+0+6)

HLTH F265 Phlebotomy Externship
3 Credits
Clinical experience in phlebotomy and lab assisting. Requires 120 hours of hands-on experience in the clinical setting and eight hours in extern seminars. Progress is assessed by work supervisor and externship coordinator. Satisfies the clinical externship requirement for certification as a phlebotomist by the American Society of Clinical Pathology. Graded Pass/Fail. ***Prerequisites: HLTH F245; enrollment by special permission only.*** (0+8.5+0.5-1)

HLTH F267 Medical Assisting Practicum Completion
2-4 Credits
Provides 100 hours of practicum work in the back office of a medical clinic for medical assisting students. Additional contact time required for meeting with the campus practicum coordinator. HLTH F267 combined with HLTH F261 provides experience equivalent to that in HLTH F268, and satisfies the practicum requirement for the medical assistant certificate and AAS. Graded Pass/Fail. ***Prerequisites: HLTH F122; HLTH F132; HLTH F234; HLTH F142; HLTH F244; enrollment by special permission only.*** (0+0+8)

HLTH F268 Medical Assisting Practicum
4 Credits
Provides the student with 180 hours of hands-on practicum work in a medical office, with additional time required for meeting with the campus practicum, coordinator. This is the last course in the medical assistant A.A.S. degree and certificate program for students who have not taken any specialized certificates during their course of study. Students will be expected to perform any and all duties of a medical assistant in a health care setting. The combination of HLTH F261 and HLTH F267 may be substituted for HLTH F268 to satisfy

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the degree requirements. Graded Pass/Fail. ***Prerequisites: HLTH F122, HLTH F132, HLTH F142, HLTH F234, HLTH F244; enrollment by special permission only.*** (0+0+12)

HIGH LATITUDE RANGE MANAGEMENT

HLRM F120 **History of Domesticated Alaskan Ungulates**
1 Credit Offered Spring
Review the history of domesticated ungulate populations, free-ranging and fenced systems, in Alaska beginning from the 1890s to present. Emphasis will be placed on traditional activities on the Seward Peninsula. ***Prerequisites: ENGL F111X or permission of instructor.*** (1+0)

HLRM F130 **Research Field Logistics**
2 Credits Offered Summer
Learn the skills, techniques, and equipment used in remote scientific fieldwork in Alaska. Course includes methods for processing and storing animal/plant tissue samples, orienteering, navigation, GPS, wilderness first aid, arctic survival, bear safety, boat safety, as well as ATV, boat, and snowmachine operation, maintenance and repair. (1+3)

HLRM F140 **High Latitude Range Management**
2 Credits Offered Fall
Policies and terminology of range and range management specific to Alaska and the Arctic. Review current vegetation inventory techniques used by federal and state agencies. Identify and sample Alaska forage plants. Examine range production systems in Alaska for a variety of species; domesticated and wild. Development of a high latitude range management plan. ***Prerequisites: BIOL F104X OR (BIOL F104 and BIOL F104L); NRM F101; or permission of instructor.*** (1.5+0+1.5)

HLRM F150 **Alaskan Ungulate Husbandry**
2 Credits Offered Summer
Students will be introduced to management skills, facilities design and nutritional needs for domesticated ungulates in Alaska. Provides exposure and examines traditional knowledge combined with contemporary research in herding and husbandry for open range and fenced systems. Field trips to reindeer, elk, bison, and/or cattle operations will demonstrate husbandry techniques and data collection procedures. ***Prerequisites: HLRM F140 or permission of instructor.*** (1.5+0+1.5)

HLRM F160 **Meat Production**
2 Credits Offered Spring
A study of the meat animal processing sequence. The production of meat-type domesticated ungulates in Alaska and the science and technology of their conversion to food, value-added products and by-products. A review of the current state regulations and methods on proper field slaughtering, and the preparation, handling and storage of meat will be introduced. ***Prerequisites: HLRM F140 or permission of instructor.*** (1.5+0+1.5)

HLRM F170 **Health Issues in Domesticated Ungulates**
2 Credits Offered Fall
Ruminant anatomy and physiology specific to high latitude ungulates. Overall health issues and problem solving techniques for domesticated ungulates, including a review of indicators for disease or parasitic infections. Vaccinations and Rx treatments; including use in food animals. Field necropsy techniques and blood and tissue collection procedures. State monitoring and identification policies. ***Prerequisites: HLRM F150 or permission of instructor.*** (1.5+0+1.5)

HLRM F201 **Field Techniques for Range Management**
2 Credits Offered Summer
Provides hands-on instruction in field and laboratory techniques in range evaluation for domesticated ungulates. Basic methods for sampling and studying grazing systems at the high latitudes will be introduced. Students will participate in data collection and analysis procedures as part of an independent research project. ***Prerequisites: ABUS F155 or MATH F103X; HLRM F130; HLRM F140; or permission of instructor.*** (1+3)

HLRM F205 **Report Writing in Range Management**
2 Credits Offered Fall
Provides the basic technical reporting methods, writing, and research skills necessary to analyze, interpret, and document field and laboratory data. Incorporating field data collected in HLRM F201 and the skills, knowledge, and techniques learned in other required courses, the student will produce a written technical report and make a presentation. ***Prerequisites: ENGL F111X; HLRM F201; or permission of instructor.*** (2+0)

HISTORY

HIST F100X **Modern World History** (s)
3 Credits
Significant aspects of modern world history, using either a chronological or an issues approach to be announced when offered. The chronological approach will examine major global developments in the twentieth century, while the issues approach will deal with such aspects of the modern world as revolutionary change, the interaction of peoples, ideology and the historical background of significant contemporary events. Also available through the Center for Distance Education. ***Prerequisites: Placement in ENGL F111X or higher; or permission of instructor.*** (3+0)

HIST F101 **Western Civilization** (s)
3 Credits Offered Fall
Origins and major political, economic, social and intellectual developments of western civilization to 1500. Also available through the Center for Distance Education. (3+0)

HIST F102 **Western Civilization** (s)
3 Credits Offered Spring
Major political, economic, social and intellectual developments of western civilization since 1500. Also available through the Center for Distance Education. (3+0)

HIST F103 **History of the Yukon-Kuskokwim Delta** (s)
3 Credits Offered as Demand Warrants
The region's history beginning with oral traditions about the creation of the area, and ending with passage of the Alaska Native Land Claims Act in 1971. Concentrates on Yup'ik social, economic and educational changes, including both native and non native accounts. Offered only at the Kuskokwim Campus. (3+0)

HIST F105 **Introduction to the History and Culture of the Seward Peninsula**
1 Credit Offered as Demand Warrants
Cultural history of the Seward Peninsula peoples for the last 10,000 years using physical anthropology, ethnography, ethnohistory, linguistics, archaeology, social anthropology, ecology and climatology. Eskimo and Euro-American cultures which have existed in western Alaska. Cross-listed with ANTH F105. (1+0)

HIST F110 **History of Alaska Natives** (s)
3 Credits Offered Fall
The history of Alaska Natives from contact to the signing of the Land Claims Settlement Act. Cross-listed with ANS F111. (3+0)

HIST F115 **Alaska, Land and Its People** (s)
3 Credits Offered Spring Even-numbered Years
A survey of Alaska from earliest days to present, its peoples, problems and prospects. (3+0)

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HIST F121 **East Asian Civilization** (s)
3 Credits Offered Fall Even-numbered Years
Origin and development of the civilizations of China, Japan and Korea from the beginning to 1800, with emphasis on traditional social, political and cultural institutions. (3+0)

HIST F122 **East Asian Civilization** (s)
3 Credits Offered Spring Odd-numbered Years
East Asia from 1800 to the present with emphasis on patterns of social cohesion, transition and revolutionary change. (3+0)

HIST F124 **African Studies: Introduction to Contemporary Sub-Saharan Africa** (s)
3 Credits Offered as Demand Warrants
A thematic overview of (sub-Saharan) Africa, covering it's geography and environment, early human evolution, social, economic and political diversity, early external influences, European Imperialism and the African responses, transatlantic slavery and its impact, African struggle for independence. Focuses on the challenges and achievements, future trends and prospect in the context of Africa today. (3+0)

HIST F131 **History of the U.S.** (s)
3 Credits Offered Fall
The discovery of America to 1865. Colonial period, revolution, formation of the constitution, western expansion, Civil War. Also available through the Center for Distance Education. (3+0)

HIST F132 **History of the U.S.** (s)
3 Credits Offered Spring
From the reconstruction to the present. Also available through the Center for Distance Education. (3+0)

HIST F202 **History of Women in America** (s)
3 Credits Offered Fall Odd-numbered Years
A chronological approach to the history of women in America. Introduction to major issues of concern to historians of women, as well as different approaches utilized in analysis of women's past; consideration of multiracial backgrounds of American women. Cross-listed with WMS F202. (3+0)

HIST F244 **Movies: Mirror of the World** (s)
3 Credits Offered as Demand Warrants
World history using the medium of film to highlight cultural, economic and political conditions of each country. Films will be from the USA, Mexico, Central America, South America, England, France, Russia, Turkey, India, China, Japan, Australia, Africa and the Arctic. (3+0)

HIST F250 **Alaska History for Local Historians**
3 Credits Offered as Demand Warrants
Techniques of regional and local historical research using exploration accounts, oral history, education reports, census studies, newspapers, etc. Final project of original research required. This local history course is currently available with emphasis on the Bering Strait, Bristol Bay and Aleutian/Pribilof regions. (3+0)

HIST F275 **Perspectives on History**
3 Credits Offered Fall
An introduction to the variety of historical approaches and to the "uses" of history. (Course is required for history majors and should be taken soon after declaring a History major as possible; non-majors are strongly discouraged from taking this course.) (3+0)

HIST F305 **Europe: 1789 – 1850** (s)
3 Credits Offered Fall Even-numbered Years
The French Revolution, Napoleon, the Industrial Revolution, the Revolutions of 1848, their impact on political, economic, social and intellectual history. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

HIST F306 **Europe: 1850 – 1900** (s)
3 Credits Offered Spring Odd-numbered Years
The European Imperium: industrialization, nationalism, imperialism and their impact on political, economic, social and intellectual history. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

HIST F315 **Europe: 1900 – 1945** (s)
3 Credits Offered Fall Odd-numbered Years
Europe through two world wars, the Russian Revolutions the depression, the development of fascism, the evolution of Russian communism. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

HIST F316 **Europe Since 1945** (s)
3 Credits Offered Spring Even-numbered Years
Germany and problems of the peace, the Soviet Union and the satellites, the Cold War, economic problems and recovery, European integration and the common market, Europe and the world. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

HIST F325 **The History of Sexuality** (s)
3 Credits Offered Summer
The history of sexuality from a worldwide comparative perspective. We will consider theories and debates about the history of sexuality, and then focus on the history of sexuality in selected times and places, with an emphasis on the modern period. ***Recommended: ENGL F211X or ENGL F213X; HIST F100X; or permission of instructor.*** Cross-listed with WMS F325. (3+0)

HIST F329 **History of the Middle East** (s)
3 Credits Offered as Demand Warrants
General survey of the Middle East from the rise of Islam to contemporary conditions. Includes classical Islam, the decline of the Ottoman Empire, modernization, European colonial influences, the Arab-Israeli conflict, political movements within the Islamic world, the position of women in Middle Eastern societies, petroleum politics and explorations of Middle Eastern culture. ***Recommended: HIST F100X.*** (3+0)

HIST F330 **Modern China** (s)
3 Credits Offered Fall Odd-numbered Years
From 1800 to the present: resistance to change, rebellion, reform, revolution and the rise of the People's Republic. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

HIST F331 **Modern Japan** (s)
3 Credits Offered Spring Even-numbered Years
From 1600 to the present: change within tradition, rise to world power and the position of Japan in the modern world. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

HIST F333 **Foundations of Japanese History** (s)
3 Credits Offered Fall Even-numbered Years
The history of Japan from earliest times to 1600: the aristocratic culture of classical Japan, the rise of the samurai in medieval Japan, the "warring states" period and national unification. Myths, religion and philosophy, and culture, arts and literature will also be covered from a historical point of view. ***Prerequisites: ENGL F211X or ENGL 213X; HIST F100X; or permission of instructor. Recommended: HIST F121.*** (3+0)

HIST F361 **Early American History** (s)
3 Credits Offered Fall Odd-numbered Years
An advanced survey that examines economic, political and social developments related to the establishment of European colonies, Indian-white relations, slavery, American Revolution, constitutional debate and the Early Republic through the War of 1812. ***Recommendations: HIST F131; sophomore standing.*** (3+0)

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HIST F362 **History of the United States 1815 – 1877** (s)
3 Credits Offered Spring Odd-numbered Years
An advanced survey that examines economic, political and social developments related to Jacksonian America, western expansion, slavery and sectionalism, the Civil War and reconstruction to 1877. ***Recommendations: HIST F131; sophomore standing.*** (3+0)

HIST F363 **History of the United States 1877 – 1945** (s)
3 Credits Offered Fall Even-numbered Years
An advanced survey that examines economic, political, and social developments related to Gilded Age America, progressive reform efforts, colonialism and the United States during two world wars. ***Recommendations: HIST F132; sophomore standing.*** (3+0)

HIST F364 **History of the United States 1945 to Present** (s)
3 Credits Offered Spring Odd-numbered Years
An advanced survey course that examines economic, political and social developments related to the Cold War, Civil Rights movement, rise of a counterculture, Vietnam war and its legacy, and America after the fall of Soviet Union. ***Recommendations: HIST F132; sophomore standing.*** (3+0)

HIST F368 **Topics in American Film History** (s)
3 Credits Offered as Demand Warrants
An in-depth study of American film and how it shapes and warps popular perceptions of America's past. A historical contrast according to Hollywood with the views and interpretations of historians. Content will vary depending on the specific genre or period of focus, such as World War II, the Vietnam War, the Great Depression, the Cold War and development of the west, etc. Course may be repeated for credit when content varies. ***Prerequisites: ENGL F111X; junior standing; or permission of instructor.*** Cross-listed with JRN F368. (3+0)

HIST F401 **Renaissance and Reformation Europe** (s)
3 Credits Offered Fall Even-numbered Years
Political, economic and intellectual developments during the 15th and 16th centuries in Europe. ***Prerequisites: HIST F275 or permission of instructor.*** (3+0)

HIST F402 **Seventeenth and Eighteenth Century Europe** (s)
3 Credits Offered Fall Odd-numbered Years
Political, social, economic, and cultural developments during the 17th and 18th centuries in Europe. ***Prerequisites: HIST F275 or permission of instructor.*** (3+0)

HIST F404 **Modern Scandinavia** (s)
3 Credits Offered Spring Even-numbered Years
Scandinavia (Denmark, Finland, Iceland, Norway and Sweden) from the 19th century to the present: the development of parliamentary democracy and welfare systems, cooperation and neutrality, and Scandinavia's experience in the world wars. ***Prerequisites: HIST F275 or permission of instructor.*** (3+0)

HIST F405 **Modern Germany** (s)
3 Credits Offered as Demand Warrants
The history of Germany from 1848 to the present. Topics include German unification under Prussian leadership; the nature and problems of the Bismarckian Reich; the outbreak of World War I and the war's impact on Germany; the rise and fall of the Weimar Republic and the Third Reich; World War II and Germany's defeat; and the postwar division, reconstruction, and reunification of Germany. Special attention given to social developments in Germany. ***Prerequisites: HIST F275 or permission of instructor.*** (3+0)

HIST F411 **Environmental History** (s)
3 Credits Offered Spring Even-numbered Years
Discussion of significant works of environmental history. Cultural history of the landscape in world civilization with emphasis on Western Europe and North America. Discussion of interdisciplinary approaches to the history of the environment and cooperative work across disciplines. ***Prerequisites: ENGL F211X or ENGL F213X; HIST F100X; HIST F275; or permission of instructor. Recommended: An introductory biology course.*** Stacked with NORS F611. (3+0)

HIST F414 **Women and Gender in East Asian History** (s)
3 Credits Offered Spring Even-numbered Years
An in-depth seminar on the history of East Asia, with a special emphasis on the experiences of women and on the issue of gender. This seminar will focus on the modern period, and on China and Japan especially, though other regions of East Asia may also be considered. ***Prerequisites: ENGL F211X or ENGL F213X; HIST F100X; or permission of instructor. Recommended: HIST F122 and/or HIST F275.*** (3+0)

HIST F415 **Seminar in World History** (s)
3 Credits
Undergraduate seminar addressing issues relating to teaching world history. Actual topics will vary to reflect recent developments in published historical literature but will include the histories of food supply, population growth, sustainability, consumerism, technology, religion, social groups, milestones of civilization and culture, and environmental history. Topics will be explored to spark discussion of issues in world history including research themes, pedagogic challenges and textual criticism. Especially intended as enrichment course for students planning careers in social science education. ***Prerequisites: ECON F100X or PS F100X; ENGL F211X or ENGL F213X; HIST F100X; HIST F275; or permission of instructor.*** (3+0)

HIST F424 **Topics in Women's History** (s)
3 Credits Offered Spring Even-numbered Years
An in-depth seminar on a specific topic of current interest. Topics may change and may cover the history of European or American women from the 18th century to the present. ***Prerequisites: HIST F275 or permission of instructor.*** Cross-listed with WMS F424. (3+0)

HIST F434 **Topics in History** (s)
3 Credits Offered as Demand Warrants
An in-depth seminar on various topics in History. Approach will vary depending on the subject of the study, but will emphasize reading, critical analysis and writing on a major issue in history. Content will vary to take advantage of different directions in history, such as cultural, intellectual or economic history. Course may be repeated for credit when content varies. ***Prerequisites: HIST F275 or permission of instructor.*** (3+0)

HIST F442 **History of the American Military** (s)
3 Credits Offered Fall
The military's place in American life and society from the Colonial era to the present. Role of the military institution in shaping the nature of American society while reflecting the character of the society it serves. Also available through the Center for Distance Education. ***Prerequisites: HIST F275 or permission of instructor.*** Cross-listed with MILS F442. (3+0)

HIST F445 **History of the American West** (s)
3 Credits Offered Fall Even-numbered Years
Seminar with emphasis on readings and analysis of primary and secondary sources dealing with the American West to present. Major themes include historiography, expansion, the Federal government, environment, ethnicity and economic development. ***Prerequisites: HIST F275 or permission of instructor.*** (3+0)

HIST F446 **American Indian History** (s)
3 Credits Offered Spring Odd-numbered Years
Seminar with emphasis on readings and analysis of primary and secondary resources related to American Indians from the pre-contact era to present. Major themes include historiography, inter-cultural relations, subsistence and environment, federal policy and contemporary issues. ***Prerequisites: HIST F275 or permission of instructor.*** (3+0)

HIST F451 **History of U.S. Foreign Policy** (s)
3 Credits Available via Independent Learning only.
Evolution of U.S. foreign policy with emphasis on post-World War II period and emergence of a bipolar distribution of power. Includes discussion of the Vietnam War, American policy in the Middle East and the foreign policy views

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of the Kennedy, Nixon, Carter and Reagan administrations. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

HIST F455 **Military History** (s)
3 Credits Offered Fall Even-numbered Years
Warfare from classical times to the present: the interrelationships of warfare and society, the role of technology and the development of tactics and strategy. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

HIST F461 W **History of Alaska** (s)
3 Credits Offered Fall
Alaska from prehistoric times to the present, including major themes such as Native Alaska, colonial and military Alaska, statehood, Alaska Native Claims Settlement Act of 1971 and the Alaska National Interest Lands Act of 1980. Also available through the Center for Distance Education. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; HIST F275; or permission of instructor.*** Stacked with HIST F662; NORS F661. (3+0)

HIST F463 **Foundations of Russian History** (s)
3 Credits Offered Fall Odd-numbered Years
The foundations of Russian society and the modern Russian state from the earliest recorded events through the early 19th century. Topics include the Scythians and Khazars, the rise of the Kievan state, Mongol domination of Russia, the rise of Muscovy, the creation of the Russian Empire under the Romanov dynasty, ethnic and social diversity, the impact of the Napoleonic invasion and the influence of western European ideas in Russia. ***Prerequisites: HIST F275 or permission of instructor. Recommended: HIST F102.*** Stacked with HIST F663; NORS F663. (3+0)

HIST F464 **Modern Russia** (s)
3 Credits Offered Fall Even-numbered Years
Russia from the early 19th century to the present. Themes include politics, culture and society in the Russian Empire, the Russian Revolution, the Soviet Union and the Russian Federation. ***Prerequisites: HIST F275 or permission of instructor.*** Stacked with HIST F664; NORS F664. (3+0)

HIST F467 W **Political Development in Latin America and the Caribbean** (s)
3 Credits Offered Fall Odd-numbered Years
Exploration of major issues and concepts in the development and governances of modern Latin America and the Caribbean region, including the legacies of colonialism, revolution, military rule, economic challenges and the quest for democratic stability. Includes a historical overview of the region and cases drawn from the Caribbean, Mexico, Central and South America. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; HIST F275; or permission of instructor. Recommended: SPAN F221.*** Cross-listed with PS F467. (3+0)

HIST F475 W **Historiography** (s)
3 Credits Offered Fall
Seminar discussions and lectures introduce philosophical approaches to history. Examines various methodological approaches to historical inquiry. Includes the nature of historical evidence, questioning of the role of truth and objectivity in history, an examination of the role of the historian in interpreting historical evidence, and different interpretations of historical events and actions. Designed for history majors and minors, and graduate students seeking to conduct historical research. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; HIST F275; history major with senior standing; or permission of instructor.*** (3+0)

HIST F476 W,O **Senior Thesis** (s)
3 Credits Offered Spring
Preparation and writing of a senior thesis using primary research materials on a topic of the student's choosing. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; HIST F475; permission of instructor.*** (3+0)

HIST F481 **Polar Exploration and its Literature** (s)
3 Credits Offered Spring Even-numbered Years
A survey of polar exploration efforts of all Western nations from A.D. 870 to the present and a consideration of the historical sources of this effort. ***Prerequisites: HIST F275 or permission of instructor.*** Stacked with HIST F681; NORS F681. (3+0)

HIST F483 W **20th Century Circumpolar History** (s)
3 Credits Offered Spring Even-numbered Years
A comparative history of the circumpolar North, including Alaska, Siberia, Scandinavia, Greenland and Canada. Focus on social, economic, political and environmental issues of the 20th century, such as exploration, aboriginal land claims, subsistence, military strategy, transportation, oil development, Arctic haze and scientific research in the Arctic. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; HIST F275; or permission of instructor.*** Stacked with HIST F683; NORS F683. (3+0)

HIST F490 W **Researching and Writing Northern History**
3 Credits Offered Spring Odd-numbered Years
Exploration of the craft and methodology of historical research in the North. Course may be repeated for credit when content varies. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; HIST F275; or permission of instructor.*** Stacked with NORS F690. (1+3)

HIST F600 **Perspectives on the North**
3 Credits Offered Fall
Basic knowledge of the circumpolar North — the social, economic, political and scientific facets of northern life. Consideration of major cultural groups of the north and their histories, the environmental settings and patterns of settlement and development in northern regions and systems of governance in different northern countries. Broad overview of the major policy issues of the North in education, justice, health care, and environmental and wildlife protection. Course is also available online. Cross-listed with NORS F600. (3+0)

HIST F661 **Mentored Teaching in History**
1 Credit
Mentored teaching provides consistent contact and supervision between student and mentoring faculty. Includes seminar, individualized tutorial and opportunity to develop teaching skills and techniques. Teaching assistants are required to be enrolled in a mentored teaching section during the period of their assistantship. May be repeated up to four times for credit. Graded Pass/Fail. ***Prerequisites: Enrollment in M.A. in Northern Studies or History; permission of instructor.*** (1+0+2)

HIST F662 **History of Alaska**
3 Credits
Alaska from prehistoric times to the present, including major themes such as Native Alaska, colonial and military Alaska, statehood, Alaska Native Claims Settlement Act of 1971 and the Alaska National Interest Lands Act of 1980. Also available through the Center for Distance Education. Cross-listed with NORS F661. Stacked with HIST F461. (3+0)

HIST F663 **Foundation of Russian History**
3 Credits
The foundations of Russian society and the modern Russian state from the earliest recorded events through the early 19th century. Topics include the Scythians and Khazars, the rise of the Kievan state, Mongol domination of Russia, the rise of Muscovy, the creation of the Russian Empire under the Romanov dynasty, ethnic and social diversity, the impact of the Napoleonic invasion and the influence of Western European ideas in Russia. ***Prerequisites: HIST F275 or permission of instructor.*** Cross-listed with NORS F663. Stacked with HIST F463. (3+0)

HIST F664 **Modern Russia**
3 Credits
Russia from the early 19th century to the present. Themes include politics, culture and society in the Russian Empire, the Russian Revolution, the Soviet Union and Russian Federation. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with NORS F664. Stacked with HIST F464. (3+0)

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HIST F681 Polar Exploration and its Literature
3 Credits
A survey of polar exploration efforts of all Western nations from A.D. 870 to the present and a consideration of historical sources of this effort. Also available through the Center for Distance Education. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with NORS F681. Stacked with HIST F481. (3+0)

HIST F683 20th Century Circumpolar History
3 Credits
A comparative history of the circumpolar north, including Alaska, Siberia, Scandinavia, Greenland and Canada. Focus on social, economic, political and environmental issues of the 20th century, such as exploration, aboriginal land claims, subsistence, military strategy, transportation, oil development, arctic haze, and scientific research in the Arctic. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with NORS F683. Stacked with HIST F483. (3+0)

HONORS

Honors Director Approval required for enrollment in any Honors courses.

HONR F290 Summer Reading Program (h)
2 Credits Offered Fall
Selected readings in a variety of disciplines. Group discussions and written responses to the readings follow in the fall. Students keep a summer journal. May be repeated for credit. ***Prerequisites: ENGL F111X; enrollment in the Honors Program; or permission of instructor.*** (2+0)

HONR F390 Liability and Values
3 Credits Offered as Demand Warrants
The study of standards of conduct and moral judgement. The professional, moral and ethical responsibilities of the individual to employers, employees and society will be examined. ***Prerequisites: Sophomore standing; permission of the Honors Director or instructor.*** (3+0)

HUMAN SERVICES

HMSV F340 Peer Advisor Training
1 Credit Offered Spring
Emphasis on developing skills needed to assist exploratory/undecided students with their academic planning and decision making. Topics include resource referral, communication/active listening, academic and career planning, time and stress management, group dynamics, and values clarification. Graded Pass/Fail. ***Prerequisites: Sophomore standing; application.*** (1+0)

HMSV F342 Peer Advising Practicum
1-3 Credits
Supervised peer advising experience (both individually and paired with faculty member) in the Academic Advising Center or appropriate department, allowing for application of theory and skills gained in HMSV F340. Course may be repeated once for credit. Graded Pass/Fail. ***Prerequisites: HMSV F340.*** (0+0)

HUMAN SERVICES

HUMS F101 Introduction to Human Services
3 Credits Offered as Demand Warrants
Provides an overview and orientation for individuals who have either started or are exploring human service careers. Designed for entry level behavioral health providers with an emphasis in understanding social service systems in rural and frontier Alaska. Learners will consider the theoretical foundations of the helping process both personal and external-driven while setting a career path that builds on individual strengths. Students should come away knowing their current worker competencies and those yet to be developed. ***Recommended: Should be taken within the first academic year when possible. Strongly encourage students to be accepted into the Human Services Degree Program.*** (3+0)

HUMS F102 Standards of Practice
2 Credits
Designed to provide an integrative approach for ongoing development of critical thinking skills, best practices evaluation, and application of skills based competencies. Students will be challenged to integrate their learning from any previous human service or related training and education, past and present work settings as well as life experiences. This process will be facilitated through the development of a professional portfolio, collaborative group learning, class discussions and the use of blended learning approaches. ***Recommended: This course should be taken as soon as possible upon acceptance into the Human Services Program.*** (2+0)

HUMS F105 Personal Awareness and Growth
2-3 Credits
Interpersonal and intrapersonal communication explored. Personal growth process presented from a holistic perspective. Focus will identify opportunities for personal enrichment through increased awareness of self and others. (2-3+0)

HUMS F117 Math Skills for Human Services
1-3 Credits Offered as Demand Warrants
Computation involving percentages, estimation, problem- solving, reading and creating graphs and tables, data organization and interpretation. Applications of computational skills will be emphasized. Cross-listed with ECE F117. (1-3+0)

HUMS F120 Cultural Diversity in Human Services
3 Credits Offered Spring
The impact of culture on the delivery of human services including Alaska Native cultures; examination of relationship of multicultural and multi-ethnic concepts. Issues of age, class, disablement, race, gender and sexual orientation will also be discussed. Student exploration of personal values and cultural world view included. (3+0)

HUMS F125 Introduction to Addictive Processes
3 Credits
Focus on gaining knowledge of the psycho-social aspects of addiction. Historic and behavioral approaches, disease concept and current trends relating to addiction presented. Twelve step and self-help approaches explored. Also available through the Center for Distance Education. Cross-listed with JUST F125. (3+0)

HUMS F130 Introduction to Mental Health and Developmental Disabilities
3 Credits Offered as Demand Warrants
Overview of the history, philosophy and identification of the mental health and developmental disability population. Basic introduction to service principles and suitability for a career in this field. ***Recommended: PSY F101; PSY F240.*** (3+0)

HUMS F140 Family Empowerment I
3 Credits Offered as Demand Warrants
Introduction to the concepts of the empowerment approach, with application to families. Concepts include respect, focus on strengths and needed system changes. Prepares and supports workers in applying skills to families. (3+0)

HUMS F150 Workforce Development I
3 Credits Offered as Demand Warrants
Introduction to the profession of workforce development, including career development theory, relevant helping skills, diverse populations, and ethics and consulting. First of two courses required to become certified as a career development facilitator. (3+1)

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HUMS F170 **Residential Child Care**
3 Credits Offered as Demand Warrants
Reviews general knowledge and specific skills required to become a competent child care worker in a residential setting. Knowledge and skills in child development, healthy relationships, attachment and separation, treatment and case planning, creating a healthy treatment environment, crisis and suicide intervention, and engaging families will be introduced. ***Recommended: PSY F101.*** (3+0)

HUMS F202 **Standards of Practice II**
1 Credit Offered Spring
This course is designed for students who are either in practicum placement or finalizing their Human Services degree program. Students will demonstrate their competencies as lifelong learners, professional readiness and personal development by encompassing their best written work and self assessment by refining their human services portfolios. Active verbal participation is required. ***Prerequisite: HUMS F102 or departmental approval.*** (1+0)

HUMS F205 **Basic Principles of Group Counseling**
3 Credits Offered Spring
Concepts and techniques of working with small groups, including establishing group goals, effective group interaction, termination and evaluation. Development of therapeutic group activities presented. (3+0)

HUMS F210 **Crisis and Grief Counseling**
3 Credits Offered Fall
Helping people in crisis from a theoretical and experiential perspective. Understanding how people feel, think and behave during periods of crisis and grieving. Suicide, violence, life transitions and AIDS explored. (3+0)

HUMS F215 **Individual Interviewing**
2-3 Credits
Introduction to interpersonal communication skills. Focus on gathering client information through the interviewing process. Emphasis on development of one to one interviewing, behavioral observation and documentation. (2-3+0)

HUMS F232 **Human Service Practicum I**
3 Credits
Integration of human service theory with skill-based training through a professional, supervised experience in a human service agency. Practicum requires 125 hours. Seminar also meets one hour per week; student-shared learning, peer support and documentation, including progress notes, social history, mental status and case planning. ***Prerequisites: Human Services major or minor; permission of instructor.*** (1+8)

HUMS F233 **Human Service Practicum II**
3-6 Credits
Continuation of HUMS F232. Course may be repeated once for credit to meet program requirements. ***Prerequisites: HUMS F232.*** (1+8)

HUMS F240 **Family Empowerment II**
4 Credits Offered as Demand Warrants
Designed for family workers to learn empowerment skills which will help them work more effectively with families. Concepts and skills include family development assessment and planning, home visiting, referrals, special services needed and how to assess them, family conferencing and cooperation and collaboration skills in working with other agencies. State and national policies affecting families and family empowerment are considered. ***Prerequisites: HUMS F140.*** (4+0)

HUMS F250 **Current Issues in Human Services**
1-4 Credits Offered as Demand Warrants
Selected current issues of importance to the human service field. Emphasis on issues impacting Alaskan communities. Repeatable for credit by Human Services majors to a maximum of 9 credits. (1-4+0)

HUMS F255 **Workforce Development II**
3 Credits Offered as Demand Warrants
Continuation of HUMS F150. Emphasis on labor market information, assessment, employability skills, public relations, program management and useful technology. Successful completion of HUMS F150 and HUMS F255 qualifies student for the certification as a career development facilitator. ***Prerequisites: HUMS F150.*** (3+1)

HUMS F260 **History of Alcohol in Alaska**
1 Credit
Significant historical forces, events and consequences related to alcohol and other drug use in Alaska. Includes current impact and trends. ***Prerequisites: HUMS F125 or permission of instructor.*** (1+0)

HUMS F261 **Substance Abuse Assessment: ASAM PPC II**
1 Credit Offered as Demand Warrants
Treatment begins with assessment of need and intensity of services required. Students will understand criteria of ASAM: PPC II and have the skill to apply it to specific cases. ***Prerequisites: HUMS F125 or permission of instructor.*** (1+0)

HUMS F262 **Pharmacology of Addictions**
1 Credit Offered as Demand Warrants
Pharmacological overview of the significant drugs of abuse in today's society. ***Prerequisites: HUMS F125.*** (1+2)

HUMS F263 **Fetal Alcohol Spectrum Disorder** (FASD)
1 Credit
Identification of alcohol-related neurodevelopmental disorder (fetal alcohol syndrome/effect), understanding of developmental differences, secondary problems and development of intervention strategies leading to best practice. (1+0)

HUMS F264 **Culture, Chemical Dependency and Alaskan Natives**
1 Credit Offered as Demand Warrants
The importance of culture to recovery and the impact of cultural diversity on counseling and service delivery. Meets requirements for certification as substance abuse counselor in Alaska. ***Prerequisites: HUMS F125.*** (1+0)

HUMS F265 **Substance Abuse and the Family**
1-2 Credits Offered as Demand Warrants
Basic understanding of family dynamics and roles related to addictions. ***Prerequisites: HUMS F125 or permission of instructor.*** (1-2+0)

HUMS F266 **Co-occurring Disorders**
1-2 Credits Offered as Demand Warrants
Theories and skills related to counseling the mentally ill substance abuser. Includes diagnosis, treatment planning and approaches, and special considerations. ***Prerequisites: HUMS F125.*** (1-2+0)

HUMS F270 **Adolescent Issues and Therapeutic Interventions**
3 Credits Offered as Demand Warrants
Basic knowledge of adolescent development and culture for the human services residential care worker. Includes communication and intervention strategies, and life skills assessment with case planning. ***Prerequisites: HUMS F170 or permission of instructor.*** (3+0)

HUMS F271 **Managing Aggressive Behavior**
1 Credit Offered as Demand Warrants
Basic knowledge and skills required to prevent and intervene in the aggressive behavior of children and youth, primarily in a residential setting. Includes interaction model of crisis intervention, the importance of blending in crisis intervention, the appropriate use of non-physical and physical intervention techniques, and effective limits and consequences. ***Prerequisites: HUMS F170.*** (1+0)

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HUMS F272 **Attachment, Separation, and Loss**
1 Credit Offered as Demand Warrants
Understanding of the components of the attachment cycle and effects on children when the cycle is disrupted by abuse, neglect, separation and placement. Includes strategies to deal with the losses. ***Prerequisites: HUMS F170.*** (1+0)

HUMS F280 **Prevention and Community Development**
3 Credits Offered Fall
Examine the historical evaluation, conceptual framework, practical realities of community development and prevention in rural Alaska. Surveys various approaches to addressing community needs, with examples from developing countries and the lower-48 as well as offers a multiplicity of approaches which can be considered in designing and implementing effective and culturally sound community projects. Collecting data to ascertain which needs exist, skills on how to build community consensus as well as exposure to the community readiness model are also covered in this course. Evaluation of efforts in terms of their success and effectiveness will also be introduced. ***Prerequisite: HUMS F101; HUMS F102; or departmental approval.*** (3+0)

HUMS F290 **Case Management**
3 Credits Offered Fall
Challenge and broaden students' understanding, thinking and conceptualizing of case management. Investigate the case management model emphasizing its useful application to various client groups with an emphasis on Alaska and rural communities. The different roles and aspects of effective case management will be explored and students will practice case management skills both at the individual level and as part of an interdisciplinary team. The role of the community in supporting such efforts as well in providing resources such as natural supports will be emphasized. Use of and knowledge of local, regional and statewide and national resources will be highlighted. Several specific functions of case management will be specifically emphasized, including that of advocate and broker. ***Prerequisite: HUMS F101; HUMS F102; or departmental approval.*** (3+0)

HUMS F301 **Ethics in Human Service**
3 Credits Offered Spring
Professional and ethical issues related to the helping professions. Ethical concerns in multicultural and rural human service delivery. Ethics and legal issues related to substance abuse counseling in Alaska. ***Prerequisites: PSY F101 or SOC F100X.*** (3+0)

HUMS F305 **Substance Abuse Counseling**
3 Credits Offered Spring
Introduction to the basic principles of substance abuse counseling. Application of counseling modalities to intervention and treatment of individuals, families and groups experiencing alcohol and drug abuse or dependence. Cross-cultural issues addressed. ***Prerequisites: HUMS F125.*** (3+0)

HUMS F310 **Management of Complex Cases**
3 Credits Offered as Demand Warrants
Concepts, policies, skills and techniques required for competence and confidence in effective case management in the human services. Includes assessment tools, advanced skills and treatment planning for complex cases, community resource identification, documentation, consultation, advocacy, building alliances with multi-agency treatment teams, and management of conflict and confrontation. Strength-based, empowerment approach. ***Prerequisites: HUMS F215 or RHS certificate. Recommended: HUMS F125; PSY F101.*** (2+2)

HUMS F397 **Management of Complex Cases**
1-6 Credits Offered as Demand Warrants
Concepts, policies, skills and techniques required for competence and confidence in effective case management in the human services. Includes assessment tools, advanced skills and treatment planning for complex cases, community resource identification, documentation, consultation, advocacy, building alliances with multi-agency treatment teams, and management of conflict and confrontation. Strength-based, empowerment approach. ***Prerequisites: HUMS F215 or RHS certificate. Recommended: HUMS F125; PSY F101.*** (1-6+0)

HUMANITIES

HUM F101 **The Humanities: A Cultural Perspective** (h)
3 Credits Offered as Demand Warrants
Examination of humanities using a non-Yup'ik culture and the Yup'ik culture as bases. Introduction of fundamental principles of Yup'ik and non-Yup'ik performing and visual arts, ideas and cultural developments that have stirred and enriched civilization, and aspects of Yup'ik and non-Yup'ik culture to help students develop greater awareness of forces that affect them. Offered only at the Kuskokwim campus. (3+0)

HUM F201X **Unity in the Arts** (h)
3 Credits Offered as Demand Warrants
Concentration on the interdependence of the visual arts, the performing arts, and literature, as set against a specific social, political and cultural background of selected eras. ***Prerequisites: Placement in ENGL F111X or higher; sophomore standing; or permission of instructor.*** (3+0)

HUM F332 **Varieties of Visual Expression: Art as Image and Idea** (h)
3 Credits Offered as Demand Warrants
Discussion of the visual elements of art, principles of visual organization, the process of artistic perception and its evaluation by the viewer. ***Prerequisites: 3 credits in the visual arts or permission of instructor.*** (3+0)

HUM F469 W **Architecture: Art, Design, Technology and Social Impact** (h)
3 Credits Offered as Demand Warrants
Concepts of environmental, urban and industrial design. Relationship of human and natural environment is stressed in this history of architecture with special attention given to contemporary conditions in urban areas and effects of industrialization and mechanization on human living and working spaces, artistic design and aesthetics. ***Prerequisites: ART F261 and ART F262 OR HUM F201X; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** Cross-listed with ART F469. (3+0)

HUM F492 **Senior Seminar** (h)
3 Credits Offered as Demand Warrants
Consideration of the humanities at the University of Alaska and on alternate approaches elsewhere. Student project paper required with oral presentation and defense. ***Prerequisites: Open requirements or permission of instructor.*** (3+0)

ITALIAN

ITAL F100A **Elementary Italian I** (h)
3 Credits Offered as Demand Warrants
Introductory study of the Italian language, culture and geography. Focuses on language skills to include grammar, vocabulary, pronunciation, and contemporary use of the language. Students will be introduced to the written and spoken language while learning about Italian culture. Does not meet Perspectives on the Human Condition requirements, or Foreign Language major or minor requirements. (3+0)

ITAL F100B **Elementary Italian II** (h)
3 Credits Offered as Demand Warrants
For students already in the process of learning Italian. Will be working individually, in pairs and in small groups toward reading, writing, listening and speaking. Focuses on language skills to include vocabulary terms, grammatical structures and conversational abilities. Will also learn about different cultures in the Italian-speaking world. Does not meet Perspectives on the Human Condition requirements, or Foreign Language major or minor requirements. ***Prerequisites: ITAL F100A or permission of instructor.*** (3+0)

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JAPANESE

JPN F100A **Elementary Japanese 1A** (h)
3 Credits Offered as Demand Warrants
Courses JPN F100A and JPN F100B are introductory courses in the Japanese language and culture with an emphasis on the spoken and written language. Does not meet Perspectives on the Human Condition requirements, or Foreign Language major or minor requirements. (3+0)

JPN F100B **Elementary Japanese 1B** (h)
3 Credits Offered as Demand Warrants
Courses JPN F100A and JPN F100B are introductory courses in the Japanese language and culture with an emphasis on the spoken and written language. Does not meet Perspectives on the Human Condition requirements, or Foreign Language major or minor requirements. ***Prerequisites: JPN F100A or instructor permission.*** (3+0)

JPN F101 **Elementary Japanese I** (h)
5 Credits Offered Fall
Introduction to spoken and written Japanese. The student will acquire a vocabulary of approximately 1,000 words and will learn to read and write the two syllabaries, hiragana and katakana, as well as 150 kanji. Cultural dimension is explored implicitly through language and explicitly through audiovisual materials. Courses are taught in Japanese. (5+0)

JPN F102 **Elementary Japanese II** (h)
5 Credits Offered Spring
Introduction to spoken and written Japanese. The student will acquire a vocabulary of approximately 1,000 words and will learn to read and write the two syllabaries, hiragana and katakana, as well as 150 kanji. Cultural dimension is explored implicitly through language and explicitly through audiovisual materials. Course is taught in Japanese. ***Prerequisites: JPN F101 or equivalent.*** (5+0)

JPN F201 **Intermediate Japanese I** (h)
4 Credits Offered Fall
The student will learn to read and write an additional 250 kanji. Conversational ability and listening comprehension enhanced by using videotape materials. Course is taught in Japanese. ***Prerequisites: JPN F102 or equivalent.*** (4+0)

JPN F202 **Intermediate Japanese II** (h)
4 Credits Offered Spring
The student will learn to read and write an additional 250 kanji. Conversational ability and listening comprehension enhanced by using videotape materials. Course is taught in Japanese. ***Prerequisites: JPN F201 or equivalent.*** (4+0)

JPN F210 **Beginning Kanji** (h)
2 Credits Offered Fall
Students will learn to read and write 500 basic kanji (Chinese characters) through studying their history, composition and artistic value. ***Prerequisites: Hiragana and Katakana recognition.*** (2+0)

JPN F301 **Advanced Japanese** (h)
3 Credits Offered Fall
Development of advanced conversational and reading skills. Topics may include: modern Japanese prose fiction; newspaper Japanese; advanced conversation through the study of common contractions and idiomatic usage in the standard Tokyo dialect; and a study of television drama series. May be repeated with different topics. ***Prerequisites: JPN F202 or equivalent.*** (3+0)

JPN F302 O **Advanced Japanese** (h)
3 Credits Offered Spring
Development of advanced conversational and reading skills. Topics may include: modern Japanese prose fiction; newspaper Japanese; advanced conversation through the study of common contractions and idiomatic usage in the standard Tokyo dialect; and a study of television drama series. May be repeated with different topics. ***Prerequisites: COMM F131X or COMM F141X; JPN F301 or equivalent.*** (3+0)

JPN F310 **Intermediate Kanji** (h)
2 Credits Offered Spring
Continuation of JPN F210 Beginning Kanji. Students will learn to read and write additional 500 kanji (Chinese characters) through studying their history, composition and artistic value. ***Prerequisites: JPN F210.*** (2+0)

JPN F311 **Advanced Kanji** (h)
2 Credits Offered as Demand Warrants
Continuation of JPN F310 Intermediate Kanji. Students will learn to read and write additional 1000 kanji (Chinese characters) through studying their history, composition and artistic value. ***Prerequisites: JPN F310.*** (2+0)

JPN F330 **Classical Japanese Literature** (h)
3 Credits Offered as Demand Warrants
A survey of the major works and genres of Japanese prose and poetry from the 8th to 18th centuries including Heian tales (monogatari), medieval folk tales and military chronicles, and the playful literature of the Edo period. Major emphases include the Tale of Genji, the Tale of the Heike and mastering the conventions that continue to be both adapted and subverted in modern Japanese literature. Course is taught in English. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

JPN F331 W **Women's Voices in Japanese Literature** (h)
3 Credits
A close reading of selected novels, short stories, poems, and diaries by Japanese women from the tenth century to the present which reveal the personal, social, aesthetic and intellectual concerns of women in different periods of Japanese history. Focus on the changing role of women in Japanese society, the role of women writers as social critics, and cross-cultural differences and similarities in women's issues. ***Prerequisites: ENGL F111X; ENGL F211X or F213X or permission of instructor; ENGL/FL F200X. Recommended: HIST F121 or HIST F122 or HIST F331.*** Cross-listed with WMS F331. (3+0)

JPN F332 **Japanese Cultural Traditions and Arts** (h)
3 Credits Offered Fall Even-numbered Years
A study of Japanese cultural traditions and arts as influenced by the religious and philosophical systems of Shinto, Buddhism, Confucianism and Taoism. Lectures will cover a wide range of Japanese traditional arts such as tea ceremony, calligraphy, martial arts, Noh, Bunraku, and Kabuki. Course is taught in English. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

JPN F333 **Twentieth Century Japanese Prose Fiction**
3 Credits Offered Spring Odd-numbered Years
A study of selected novels, short stories and film scripts in translation representative of styles and themes which characterize twentieth century Japanese literature. Analysis of each work in terms of characterization, themes, structure, style and as an expression of social problems or intellectual issues in modern Japanese society. Course is taught in English. Note: Course may be repeated for credit when topic varies. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

JPN F431 **Studies in Japanese Culture** (h)
3 Credits Offered Fall
Further study of advanced written and spoken Japanese through essays, newspaper and journal articles, and television documentaries dealing with topics in Japanese culture. Note: Course may be repeated for credit when topic varies. ***Prerequisites: JPN F302 or permission of instructor.*** (3+0)

JPN F432 **Studies in Japanese Language** (h)
3 Credits Offered Spring
In-depth study of Japanese language or literature. Course may be repeated for credit when topics vary. ***Prerequisites: JPN F302 or permission of instructor.*** (3+0)

JPN F475 **Seminar on Contemporary Japan** (h)
3 Credits Offered as Demand Warrants
Ties together various threads of the Japanese studies program and gives students an opportunity to apply their knowledge to contemporary issues in

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Japan. Provides a forum for student presentations of research papers begun in Japan. ***Prerequisites: Upper-division semester in Japan at pre-approved program.*** (3+0)

JPN F482 **Selected Topics in Japanese** (h)
3 Credits Offered as Demand Warrants
Focuses on topics not covered in JPN F431 or JPN F432. May be repeated for credit. ***Prerequisites: JPN F302 or equivalent; junior standing; or permission of instructor.*** (3+0)

JPN F488 **Individual Study: Senior Project** (h)
3 Credits Offered as Demand Warrants
Designed to permit the student to demonstrate ability to work with the language and the culture through the analysis and presentation, in Japanese, of a problem chosen by the student in consultation with the department. Offered normally in the semester preceding the student's graduation. Conducted in Japanese. Note: The student must apply for senior project and submit project outline by the end of the sixth week of the semester preceding the semester of graduation. ***Prerequisites: At least 10 credits in upper-division Japanese or permission of instructor.*** (3+0+1)

JOURNALISM

JRN F101 **Introduction to Mass Communications** (h)
3 Credits Offered Fall
History and principles of mass communications and the role of information media in American society. Introduction to professional aspects of mass communications, including print and broadcast. Also available through the Center for Distance Education. (3+0)

JRN F102 **Introduction to Broadcasting** (h)
3 Credits Offered as Demand Warrants
Principles of broadcasting as they relate to the people of the United States, including history, government involvement and social effects. Also available through the Center for Distance Education. (3+0)

JRN F105 **History of the Cinema** (h)
3 Credits
History and development of the medium of film in the United States and abroad during the last 100 years. Content will vary each semester. Cross-listed with FLM F105. (3+0)

JRN F202 **News Reporting and Writing** (h)
3 Credits
Finding and getting the story, writing the lead, developing story structure, writing on deadline, editing copy, writing headlines and captions, cropping and sizing pictures, and writing for broadcast news. Special fees apply. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (3+0)

JRN F203 **Basic Photography** (h)
3 Credits
Photography fundamentals, including use of an adjustable camera, film and exposure techniques, filters, flash techniques, and an introduction to color. Darkroom procedures including black and white film processing and printing, photograph design and composition. Students must have use of an adjustable camera. Special fees apply. (2+3)

JRN F204 **Digital Basic Photography** (h)
3 Credits
Introduction to the technical and aesthetic aspects of basic digital photography via digital SLR cameras and editing through digital photo suites such as Adobe Photoshop. Students are expected to have intermediate computer knowledge. Topics include controlling digital SLRs on manual settings, photographing creatively, basic and advanced editing techniques, negative scanning and digital printing. Special fees apply. (3+0)

JRN F215 **Radio Production**
3 Credits Offered Fall
Sound production techniques for radio and television. Emphasis on writing, recording, control room techniques and editing. Special fees apply. (2+3)

JRN F217 **Introduction to the Study of Film** (h)
3 Credits Offered Spring
An appreciation course designed to introduce the student to the various forms of cinematic art with special emphasis on humanistic and artistic aspects. ***Prerequisites: ENGL F111X.*** Cross-listed with ENGL F217; FLM F217. (2+2)

JRN F220 **Adobe Photoshop**
3 Credits Offered Fall
Create images that go beyond traditional photo editing and into the realm of painting with depth color manipulation. Includes use of a computer, scanner, analog images and digital camera. Includes ethical and copyright issues of photography manipulation. ***Prerequisites: JRN F250. Recommended: Advanced knowledge of Macintosh operating system.*** (3+0)

JRN F240 **Foreign Corresponding** (h)
3 Credits Offered Spring
The U.S. tradition of "objective" journalism holds sway in very few countries. How did these varying approaches develop, and what do they mean for how Americans report overseas and how foreign journalists report about us? (3+0)

JRN F250 **Website Design**
3 Credits Offered Fall
Create website projects. Includes the Internet, design, multimedia and the incorporation of text, sound, images, animation and video. Special fees apply. ***Prerequisites: Familiarity with the World Wide Web, Internet browsers, the Macintosh operating systems, and image editing software; or permission of instructor.*** (3+0)

JRN F251 **Television Production**
4 Credits Offered Fall
Television studio production, floor directing, audio, camera, staging, lighting and switching. Special fees apply. Cross-listed with FLM F251. (2+5)

JRN F280 **Video Storytelling** (h)
3 Credits Offered Fall
Basics of digital video production technology, composition, audio, lighting and editing as it relates to primarily non-fiction filmmaking. Students will conclude the course by producing their own short videos. Special fees apply. Cross-listed with FLM F280. (3+0)

JRN F290 **Digital Video Editing**
3 Credits Offered as Demand Warrants
Introduction to the technical and aesthetic aspects of non-linear digital video editing. Students will go from little or no experience in non-linear editing to being comfortable with some of the advanced editing techniques. Address motion picture editing theories that are not bound to time or specific editing technology. Special fees apply. Cross-listed with FLM F290. (3+0)

JRN F300 **Internship**
1-3 Credits
Practical experience working with campus media, individual media-related projects for business or media, or in a professional media environment. ***Prerequisites: JRN F202 or permission of instructor.*** (1+6)

JRN F305 **Snedden Chair Lectures**
3 Credits Offered Fall
Rotating series of lectures and seminars with America's leading journalists on topics ranging from war reporting to covering sports. Please contact Department of Journalism for current topic and instructor. Course may be repeated for credit. Special fees apply. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

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JRN F308 **Film Criticism** (h)
3 Credits
Theoretical approaches to viewing, analyzing and evaluating film and television program content. Note: Available via Independent Learning only. Cross-listed with FLM F308. (3+0)

JRN F311 W **Magazine Article Writing** (h)
3 Credits Offered Fall
Learn to identify great article ideas, turn them into finished products and pitch them to magazine editors. Workshops and extensive instructor feedback. Students repeating the course limited to six credits. Also available through the Center for Distance Education. Special fees apply. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; JRN F202; or permission of instructor.*** (3+0)

JRN F323 **Editing for Journalists**
3 Credits Offered Spring
Tricks of the trade, including copyediting; writing headlines and captions; basic page design using computers; and thinking like the editor-in-chief. Special fees apply. ***Prerequisites: JRN F202 or permission of instructor; junior standing.*** (3+0)

JRN F324 **Typography and Publication Design**
3 Credits Offered Spring
Typography, layout and design, coupled with a study of the methods of printing production. Special fees apply. ***Prerequisites: Permission of instructor.*** (2+2)

JRN F347 O **Lighting Design** (h)
3 Credits Offered Fall Even-numbered Years
Principles and techniques of theatrical lighting design. The student will conduct practical experiments and design projects applying the experience gained from the experiments. Also available through the Center for Distance Education. ***Prerequisites: COMM F131X or COMM F141X; THR F343; or permission of instructor. May be taken concurrently with THR F343.*** Cross-listed with ART F347; THR F347. (3+0)

JRN F368 **Topics in American Film History** (s)
3 Credits Offered as Demand Warrants
American film and how it shapes and warps popular perceptions of America's past. A historical contrast according to Hollywood with the views and interpretations of historians. Content will vary depending on the specific genre or period of focus, such as World War II, the Vietnam War, the Great Depression, the Cold War and development of the west, etc. Course may be repeated for credit when content varies. ***Prerequisites: HIST F131 or HIST F132; JRN F217 or JRN F308; or permission of instructor.*** Cross-listed with HIST F368. (3+0)

JRN F371 O **Digital Photography and Pixel Painting**
3 Credits
An introduction to the world of digital imaging with applications in fine and commercial art. It is expected that students will become competent in creating convincing images of impossible subjects as well as detecting their creation by others. The varied ethical issues engendered by this expertise will be addressed in depth. Students will be required to gain proficiency in visual design for electronic and print publication. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; Macintosh OS or Windows OS experience with graphic applications; one college level studio art course.*** Cross-listed with ART F371; FLM F371. (1+4)

JRN F380 O **Women, Minorities and the Media** (h)
3 Credits Offered Fall
Examination of how women and minorities are portrayed in the mass media, the employment of women and minorities in the media, as well as how accurately the media reflects our society demographically. Presented from a feminist, multi-culturalist perspective using a broad feminist analysis encompassing issues of gender as well as class, race, age and sexual orientation. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; junior standing.*** Cross-listed with WMS F380. (3+0)

JRN F390 **New Media Toolkit** (h)
3 Credits Offered as Demand Warrants
Focus on the content and technology needed in today's newsrooms. Students will explore blogging and its place in journalism, basic audio production, digital photography, multimedia package production, and the latest Web 2.0 technologies. History of "new media" and its place in the changing journalism landscape will also be discussed. Special fees apply. ***Prerequisites: ENGL F111X or ENGL F213X; JRN F202; or permission of instructor.*** (2.5+0.5)

JRN F400 **Professional Media Internship**
1-3 Credits
Practical training in a supervised, professional media environment. Participation at an approved publication, TV or radio station, or other media-related business or non-profit organization is required. ***Prerequisites: Senior standing or permission of instructor.*** (1+6)

JRN F401 **Beat Reporting**
3 Credits Offered Fall
Intensive training in developing and covering a news beat (chosen by the student) and the basics of common news beats: police, courts and government. Includes cultivating sources, explaining complicated stories, reporting trends, improving interviewing techniques, and employing advanced writing skills. Writing for publication encouraged. Special fees apply. ***Prerequisites: JRN F202.*** (2+2)

JRN F402 **Advanced Photography** (h)
3 Credits Offered Fall
Continuation of JRN F203. Emphasis on continuing development of photographic skills by application of basic technical skills to a variety of areas of photography. Special fees apply. ***Prerequisites: JRN F203 or instructor permission.*** (2+3)

JRN F404 **Photojournalism I** (h)
3 Credits Offered Fall
Fundamentals of visual communication through photography; issues and techniques of modern photojournalism; news, features, sports, and photo essay assignments as encountered at a daily newspaper; preparation of photographs for publication. Students must have basic 35mm camera equipment. Special fees apply. ***Prerequisites: JRN F203 or instructor permission.*** (2+3)

JRN F405 **Advanced Photography Seminar**
3 Credits Offered Spring Odd-numbered Years
Advanced discussion of photojournalism and photographic topics. Topics range from the photographic essay to the history of photography and working in series. Weekly classroom meetings supplemented by field, studio and darkroom sessions. Special fees apply. ***Prerequisites: JRN F402; JRN F404; or permission of instructor.*** Stacked with JRN F605. (2+3)

JRN F406 **Photojournalism II**
3 Credits Offered Spring Even-numbered Years
Continuation of Photojournalism I. Emphasis on developing skills in photo essay and documentary photography, and working as a freelance photojournalist. Seminar-style class includes work with film and digital equipment. Special fees apply. ***Prerequisites: JRN F404.*** (2+2)

JRN F407 **Ink Jet Printing**
3 Credits Offered Fall
Learn to make ink jet prints from various photographic sources, including digital capture and scanned film. Emphasis on applying Photoshop methods for making fine prints in black and white and color. Special fees apply. ***Prerequisite: JRN F203 or permission of instructor.*** (2.5+2)

JRN F408 **Media Management**
3 Credits Offered as Demand Warrants
Overview of media management, including management theories, media competition, media research, regulatory issues of concern to managers, organizational planning and future trends in media. Case studies in practical problem-solving techniques. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

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JRN F411 W **Writing for a Living**
3 Credits Offered as Demand Warrants
Writing advanced prose for publication in books or magazines. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; JRN F311; or permission of instructor.*** (3+0)

JRN F413 **Mass Media Law and Regulation** (s)
3 Credits Offered Fall
Common law, statutory law and administrative law that affects the mass media, including libel, copyright, access to the media, constitutional problems, privacy, shield laws and broadcast regulations. Also available through the Center for Distance Education. ***Prerequisites: JRN F202 or permission of instructor.*** (3+0)

JRN F421 **Journalism in Perspective** (h)
3 Credits Offered Fall
Seminar-style exploration of the ethical, financial, corporate and international trends tugging at American journalism. ***Prerequisites: Junior standing.*** (3+0)

JRN F440 **Ethics and Reporting in the Far North**
3 Credits Offered as Demand Warrants
Historical overview of media coverage of the northern frontier with focus on journalistic ethics. Comparison made to media climate in third world countries. Special fees apply. Stacked with JRN F640; NORS F640. (3+0)

JRN F444 W **Investigative Reporting** (h)
3 Credits Offered Spring
Advanced reporting of news with emphasis on public affairs. Develops sophisticated news judgment, writing and investigative reporting skills for print and electronic media. Special fees apply. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; JRN F202; JRN F401; junior standing; or permission of instructor.*** (2+2)

JRN F451 O **Television Production**
4 Credits
Television studio production, floor directing, audio, camera, staging, lighting and switching. Special fees apply. ***Prerequisites: JRN 215; COMM F131X or COMM F141X; or permission of instructor.*** (2+5)

JRN F452 W **Radio and Television News Writing**
3 Credits Offered Spring
Overview of radio and television news writing. Emphasis on intensive news writing practice, including interviewing techniques, ethical issues and current controversies, and structure of television and radio news operations. Special fees apply. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; JRN F202.*** (3+0)

JRN F453 O **Television News Reporting**
3 Credits Offered Spring
Electronic news gathering using videotape equipment, scriptwriting, location sound recording, interview techniques, editing, videography and other aspects of field news reporting. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; JRN F451; JRN F452. JRN F452 may be taken concurrently with JRN F453.*** (2+2)

JRN F454 **Advanced TV News Production**
3 Credits Offered Fall
In-depth experience with television news production including electronic newsgathering. Emphasis on producing broadcast quality news footage and packages. May be repeated once. Only the first 3 credits count toward major approved-elective requirements. Special fees apply. ***Prerequisites: JRN F251; JRN F452; JRN F453.*** (1+6)

JRN F456 W **Science Writing for Magazines and Newspapers** (h)
3 Credits Offered as Demand Warrants
Students write and analyze science articles aimed at the general public. Course work includes writing and reading assignments, class workshops and conferences with the instructor. Emphasis on recognizing, finding and developing science stories; structuring articles; capturing reader interest; maintaining accuracy; and getting published. Scientists are welcome, but science background is not necessary. Repeatable once for additional credit with permission of instructor. Special fees apply. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; JRN F202; or permission of instructor.*** Stacked with JRN F656. (3+0)

JRN F460 **History of German Film** (h)
3 Credits Offered as Demand Warrants
In-depth study of a representative selection of films from the 1920's to the present, taught in English and German (films will be in German with English subtitles). Students of German will have a special discussion session in German and will do reading and writing in German. ***Prerequisites: Junior standing or permission of instructor.*** Cross-listed with GER F460. (3+0)

JRN F471 O **Advanced Digital Design** (h)
3 Credits Offered Spring
Project-oriented class in graphic design with applications from journalism to fine and commercial art. Students will be expected to have a background in programs likely to include web design, digital photography and graphic design. May be repeated for credit with permission of instructor. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; JRN F250; JRN F350; ART/JRN F371; one college level studio art course.*** Cross-listed with ART F471. (1+4)

JRN F472 O **Visualization and Animation** (h)
3 Credits Offered Spring
An introduction to visualization and animation with applications in fine and commercial art and science. Students will produce a series of three dimensional animation projects which will introduce them to the tools and concepts used by animation and visualization professionals. Note: May be repeated for credit. Special fees apply. ***Prerequisites: ART F471 or equivalent; COMM F131X or COMM F141X; plus UNIX experience.*** Cross-listed with ART F472; FLM F472. (1+4)

JRN F480 **Documentary Filmmaking** (h)
3 Credits Offered Spring
Basics of hands-on documentary filmmaking techniques, including preproduction, production and postproduction. Different documentary filmmaking directing styles and the process of distributing a documentary. Each student will produce a short documentary as the capstone of the course. Special fees apply. ***Prerequisites: Basic experience in shooting and editing video or permission of instructor.*** Cross-listed with: FLM F480. (3+0)

JRN F484 **Multimedia Theory and Practice** (h)
3 Credits Offered Spring
Study of techniques needed to produce multimedia with a special project for a university or community agency as the required final. For the purpose of this course, multimedia is defined as computer-based, user-driven products with audio, visual and text components and also video or film where appropriate. Primary program is Flash. Special fees apply. ***Prerequisites: Understanding of computer graphics programs like Illustrator, Freehand, etc. plus some mastery of a specialty like writing, art or television production.*** Cross-listed with ART F484. Stacked with ART F684; JRN F684. (2+3)

JRN F490 **Online Publication: "Extreme Alaska"**
3 Credits
Using the department's multimedia newsroom facilities, senior-level students work on a team, under the guidance of an instructor, to publish an online publication. Students are expected to show substantial initiative and creativity as they make use of the skills they have acquired in other journalism courses. Course may be repeated once for credit. Special fees apply. ***Prerequisites: JRN F202; senior standing; or permission of instructor.*** (2+2)

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JRN F601 **Communication Research Methodologies: Social Science**
3 Credits
Introduction to the range of methodologies used to produce both practical and theoretic knowledge in the discipline. Presents the relationships between scientific questions, appropriate selection of methodology and types of knowledge products. Note: COMM/JRN F601 is a required core course for the M.A. in Professional Communication. Cross-listed with COMM F601. (3+0)

JRN F605 **Advanced Photography Seminar**
3 Credits Offered Spring Odd-numbered Years
Advanced discussion of photojournalism and photographic topics with field, studio, and darkroom sessions. Topics will range from the photographic essay to the history of photography and working in series. Weekly classroom meeting will be supplemented by field, studio, and darkroom sessions. Special fees apply. ***Prerequisites: JRN F402; JRN F404; or permission of instructor.*** Stacked with JRN F405. (2+3)

JRN F611 **Advanced Writing for Publication**
3 Credits Offered as Demand Warrants
An intensive writing course focused on producing books and in-depth magazine features. Emphasis will be on writing, editing and research. The business and legal aspects of becoming an author will also be covered. Special fees apply. ***Prerequisites: JRN F202 or comparable upper-division ENGL courses; graduate standing; or permission of instructor.*** (3+3)

JRN F613 **Advanced Mass Media Law and Regulation**
3 Credits Offered as Demand Warrants
Seminar on current issues, legal opinions and legislative actions which directly affect the mass media. Special emphasis on technological evolution, corporate growth and deregulation of administrative media law. ***Prerequisites: Graduate standing.*** (3+0)

JRN F625 **Communication Theory**
3 Credits Offered Fall
Required course for the M.A. in Professional Communication. The course is designed to acquaint students with both the historical evolution of the discipline against the backdrop of the evolution of the social sciences and with the theoretical perspectives of knowledge-building that have marked that disciplinary evolution. Students will learn the contextual interconnectedness of philosophy and theory. Finally, Communication Theory will also make the essential connections between theoretical perspectives and their professional uses. Cross-listed with COMM F625. (3+0)

JRN F633 **Public Relations Theory and Practice**
3 Credits Offered as Demand Warrants
Theory, practice and research in public relations. Emphasis on public relations in business, industry, government institutions and nonprofit organizations, as well as the role of public relations in American mass media. ***Prerequisites: Graduate standing.*** (3+0)

JRN F640 **Ethics and Reporting in the Far North**
3 Credits Offered as Demand Warrants
Historical overview of media coverage of the northern frontier with focus on journalistic ethics. Comparison made to media climate in third world countries. Cross-listed with NORS F640. Stacked with JRN F440. (3+0)

JRN F641 **Comparative Media Studies**
3 Credits Offered as Demand Warrants
Historical development of different mass communication systems around the globe. The relationship between press philosophies and their practical implementation. Mass communication systems of selected countries as representative examples of generalized systems. ***Prerequisites: Graduate standing.*** (3+0)

JRN F656 **Science Writing for Magazines and Newspapers**
3 Credits Offered as Demand Warrants
Students write and analyze science articles aimed at the general public. Course work includes writing and reading assignments, class workshops and conferences with the instructor. Emphasis on recognizing, finding and developing science stories; structuring articles; capturing reader interest; maintaining accuracy; and getting published. Scientists are welcome, but science background is not necessary. Repeatable once for additional credit with permission of instructor. Special fees apply. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with JRN F456. (3+0)

JRN F661 **Mentored Teaching in Journalism**
1 Credit Offered as Demand Warrants
Mentored teaching provides consistent contact on course-related issues between teaching assistants and mentoring faculty. May be repeated up to four times for credit. Note: Teaching assistants are required to be enrolled in a mentored teaching section while teaching. ***Prerequisites: Admission to M.A. in Professional Communications; journalism track teaching assistantship award.*** (1+0+2)

JRN F684 **Multimedia Theory and Practice**
3 Credits Offered Spring
Study of techniques needed to produce multimedia with a special project for some university or community agency as the required final. For the purpose of this course multimedia is defined as computer-based, user-driven products with audio, visual and text components and also video or film where appropriate. Primary program is Flash. Special fees apply. ***Prerequisites: Understanding of computer graphics [programs like Illustrator, Freehand, etc.] plus some mastery of a specialty like writing, art, or television production.*** Cross-listed with ART F684. Stacked with: ART F484; JRN F484. (3+3)

JRN F685 **Publishing, Production and Theory**
3 Credits
Writing, editing and production techniques for high school publication. Topics: desktop publishing, basic and electronic photography, advertising management and legal liabilities. Examination of value of First Amendment to a democratic government. Requires access to a computer. UA computer network provides network to other teachers. ***Prerequisites: Certified teacher or permission of instructor.*** (3+0)

JUSTICE

JUST F110 **Introduction to Justice** (s)
3 Credits
Survey of the structure and process of the agencies of criminal justice. Includes introduction to criminology, criminal law, police, courts and corrections. Also available through the Center for Distance Education. (3+0)

JUST F125 **Introduction to Addictive Processes**
3 Credits
Focus on gaining knowledge of the psycho-social aspects of addiction. Historic and behavioral approaches, disease concept and current trends relating to addiction presented. Twelve step and self-help approaches explored. Cross-listed with HUMS F125. (3+0)

JUST F222 **Research Methods** (s)
3 Credits Offered Fall
Application of social science research methods to solving scientific and nonscientific questions arising in justice or political science. Basic methods include statistical analysis, survey research, and Internet applications. ***Prerequisites: JUST F110.*** (3+0)

JUST F251 **Criminology** (s)
3 Credits Offered Spring
The study of the major areas of deviant behavior and its relationship to society, law and law enforcement, including the theories of crime causation. ***Prerequisites: JUST F110.*** (3+0)

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JUST F300X **Ethics and Justice** (h)
3 Credits
An examination of ethical and moral concepts, and their relationship to criminal justice issues. Applies ethics theories to the criminal justice institutions of police, courts and corrections. Examines ethical and moral dilemmas which confront crime control policy makers. ***Prerequisites: Junior standing.*** (3+0)

JUST F310 **Principles of Corrections** (s)
3 Credits Offered Spring Even-numbered Years
An introduction to adult institutions, community- based programs, and theories of incarceration. Correctional programs are examined. ***Prerequisites: JUST F110; junior standing.*** (3+0)

JUST F320 **Practicum**
1-6 Credits
A research-oriented exercise directed at the resolution of a specific problem within an agency of the criminal justice system. May be repeated to a maximum of six credits. ***Prerequisites: JUST F110; junior standing.*** (1-6+0)

JUST F335 W **Gender and Crime**
3 Credits Offered Spring
An exploration of gender and crime including the extent of female crime, victimization, masculinity and violence, and women professionals in the justice system. ***Prerequisites: JUST F110; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; junior standing.*** Cross-listed with WMS F335. (3+0)

JUST F340 **Rural Justice in Alaska** (s)
3 Credits Offered Fall
Application of the western justice system to remote northern Native villages including issues arising from cultural conflicts, difficulties associated with a centralized justice system serving distant roadless communities, the federal/Indian relationship, and a description of crime occurring in the villages. ***Prerequisites: JUST F110; junior standing.*** (3+0)

JUST F345 W **Police Problems**
3 Credits Offered Fall
Analysis of the nature of coercive power and the special problems faced by people who assume the responsibility of coercing others; how coercive power affects personality and how personality affects the way different types of people respond to the challenge and responsibilities of using coercive means; conditions that discourage excessive use of coercive means and encourage police officers to develop in morally and politically mature ways. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; JUST F110; junior standing.*** (3+0)

JUST F352 **Criminal Law**
3 Credits
A study of elements, purposes and functions of the substantive criminal law with emphasis upon historical and philosophical concepts. ***Prerequisites: JUST F110; junior standing.*** (3+0)

JUST F354 **Procedural Law**
3 Credits Offered Fall
The legal limitations of the police and the right of the people to be secure from the government under the protections of the Constitution and the Rules of Evidence. ***Prerequisites: ENGL F111X; JUST F110; junior standing.*** (3+0)

JUST F358 **Juvenile Delinquency** (s)
3 Credits Offered Fall
Theories of delinquency, the extent of delinquency, the historical development of juvenile justice, the juvenile system, and how it impacts on youth in relation to police, courts, institutions and community programs. Includes youth violence, gangs, gender, race and class. ***Prerequisites: JUST F110; JUST F251; or permission of instructor.*** (3+0)

JUST F404 **Introduction to Legal Research and Writing**
3 Credits Offered Spring
Methods of legal research and preparation of legal materials. Introduction to the resources of law libraries and the techniques of presenting issues in legal form. ***Prerequisites: PS F101 or JUST F110; PS F303; junior standing; permission of instructor.*** Cross-listed with PS F404. (3+0)

JUST F452 **Comparative Criminology** (s)
3 Credits Offered Spring Even-numbered Years
An issue-based approach to crime within selected countries including such topics as restorative justice, violence against women, drugs, punishment, juvenile justice and the death penalty. The structure and operation of justice systems, as well as the influence of culture, will be considered in regard to various developed and underdeveloped nations. ***Prerequisites: JUST F110; junior standing.*** (3+0)

JUST F454 W **Advanced Problems in Procedural Law**
3 Credits Offered Spring
Advanced study of the elements of criminal procedural law. Emphasis on the legal limitations of the police and the right of people to be secure from the government under protections of the U.S. Constitution and "rules of evidence." ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; JUST F110; JUST F354; junior standing; or permission of instructor.*** (3+0)

JUST F460 O **American Crime Control** (s)
3 Credits Offered Fall
Major concepts of the structure and process of criminal justice revisited with emphasis on current issues. ***Prerequisites: COMM F131X or COMM F141X; JUST F110; JUST F222; JUST F251; senior standing; Justice major.*** (3+0)

JUST F475 **Internship**
3-9 Credits
Supervised work experience in criminal justice agencies. ***Prerequisites: Permission of director of intern program. Note: Department approval required for 9 credits.*** (3-9+0)

JUST F492 **Seminar**
1-6 Credits
Various topics of current interest and importance to the justice major will be presented. Topics will be announced prior to each offering. ***Prerequisites: JUST F110; junior standing; permission of instructor.*** (1-6+0)

JUST F605 **Administration and Management of Criminal Justice Organizations**
3 Credits Offered Fall
A comprehensive overview of management and administration of criminal justice agencies with an emphasis on organizational behavior. Included is the study of management theories, leadership roles, and the development of human resources within the organizational context. This course will be Offered via the Internet. Note: Offered via the Internet. ***Prerequisites: Admission to the M.A. degree program in Justice. Recommended: B.A. or B.S. in relevant area.*** (3+0+6)

JUST F610 **Ethics in Criminal Justice Management**
3 Credits Offered as Demand Warrants
Confronting ethical situations that may arise in the management of criminal justice organizations. Examination of the ethical and moral foundations of our current criminal justice system to help make decisions in keeping with the goals of justice. Note: Offered via the Internet. ***Prerequisites: Admission to the M.A. degree program in Justice. Recommended: B.A. or B.S. in relevant area.*** (3+0+6)

JUST F615 **Justice Program Planning/ Evaluation and Grant Writing**
3 Credits Offered Spring
Program planning and evaluation. Includes grant proposal writing with emphasis on federal sources of grant funding. Note: Offered via the Internet. ***Prerequisites: Admission to M.A. in Justice program. Recommended: B.A. or B.S. in relevant area.*** (3+0+6)

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JUST F620 **Personnel Management in Criminal Justice**
3 Credits Offered as Demand Warrants
Foundation for effective management of personnel in criminal justice by supervisors. Includes recruiting, selection, training, on-site supervision, termination and replacement of subordinates. Offered via the Internet. ***Prerequisites: Admission to M.A. in Justice program. Recommended: B.A. or B.S. degree in relevant area.*** (3+0+6)

JUST F625 **Legal Aspect of Criminal Justice Management**
3 Credits Offered Spring
A basic understanding of legal issues faced by criminal justice managers and administrators. Included is a study of the legal considerations surrounding recruitment and hiring practices, sexual harassment, the Age Discrimination in Employment Act, the Americans with Disabilities Act and the Fair Labor Standards Act. The course will be Offered via the Internet. Note: Offered via the Internet. ***Prerequisites: Admissions to the M.A. in Justice program. Recommended: B.A. or B.S. in relevant area.*** (3+0+6)

JUST F630 **Media Relations and Public Relations**
3 Credits Offered as Demand Warrants
Understanding the role of the media in modern society and how to effectively represent an organization to the media. Includes First Amendment and Freedom of Information Act case law and administrative decisions involving the broadcast media. The primary focus is upon preparing justice administrators to effectively meet their legal obligations with regard to dissemination of information to the media and the public. Note: Offered via the Internet. ***Prerequisites: Admission to M.A. in Justice program. Recommended: B.A. or B.S. in relevant area.*** (3+0+6)

JUST F640 **Community/Restorative Justice**
3 Credits Offered Fall
Using community resources to address public safety concerns. Includes recent developments and an emerging awareness that public safety solutions can be achieved efficiently by cooperative efforts between justice agencies and community resources. Note: Offered via the Internet. ***Prerequisites: Admission to M.A. in Justice program. Recommended: B.A. or B.S. in relevant area.*** (3+0+6)

JUST F650 **Analysis Techniques for the Criminal Justice Administrator**
3 Credits Offered as Demand Warrants
Common techniques used to analyze numerical data commonly found occurring in small to large agencies. Emphasis on issues of data quality such as reliability and validity, methods of graphical presentation, inferential techniques, forecasting models, sampling techniques and computer analysis programs such as Statistical Programs for the Social Sciences (SPSS). Note: Web-based course with contact over discussion board and e-mail. ***Prerequisites: JUST F605; and admission to M.A. in Justice program.*** (3+0)

JUST F670 **Seminar in the Administration of Juvenile Justice**
3 Credits Offered Spring
Legal and administrative aspects of the juvenile justice system. Emphasis will be placed on developing an applied knowledge regarding the administration of juvenile justice within the legal framework. Includes hypothetical situations in an effort to enhance the ability to apply theoretical concepts to real life situations. Offered via the Internet. ***Prerequisites: JUST F605; admission to M.A. in Justice program.*** (3+0+6)

JUST F690 **Seminar in Critical Issues and Criminal Justice Policy**
3 Credits Offered as Demand Warrants
This seminar will be the only course actually requiring a student to attend on the UAF Campus. The seminar will last for one week and the student will be required to attend sessions 8 hours a day. Topics of current interest. Candidates in standing for the M.A. degree in Justice will a make presentations. Attendance is required on the UAF campus. Offered via the Internet. ***Prerequisites: Admissions to M.A. in Justice program. Recommended: B.A. or B.S. in relevant area.*** (3+0+6)

LATIN

LAT F101 **Beginning Latin I** (h)
3 Credits
Introduction to ancient Latin language and Roman culture, development of competence through reading original authors with emphasis on vocabulary, recognition and correct use of grammar. Does not satisfy core curriculum requirement. Note: Offered through the Center for Distance Education only. (3+0)

LAT F102 **Beginning Latin II** (h)
3 Credits
Continuation of the introduction to ancient Latin language and Roman culture, development of competence through reading original authors with emphasis on vocabulary, recognition and correct use of grammar. Does not satisfy core curriculum requirement. Note: Offered through the Center for Distance Education only. ***Prerequisites: LAT F101.*** (3+0)

LAT F201 **Intermediate Latin I** (h)
3 Credits
Continuation of LAT F102. Increasing development of competence through reading original authors with growing emphasis on grammar usage and vocabulary. Does not satisfy core curriculum requirement. Note: Offered through the Center for Distance Education only. ***Prerequisites: First year college Latin, or a functional equivalent.*** (3+0)

LAT F202 **Intermediate Latin II** (h)
3 Credits
Continuation of LAT F201. Increasing development of competence through reading original authors with growing emphasis on grammar usage and vocabulary. Does not satisfy core curriculum requirement. Note: Offered through the Center for Distance Education only. ***Prerequisites: LAT F201 or equivalent.*** (3+0)

LAW ENFORCEMENT

LE F110 **Cultural and Behavioral Strategies for Law Enforcement Officers**
1 Credit Offered as Demand Warrants
Introduction to a number of behavioral strategies to facilitate interaction among various cultures to be found in Alaska. It also gives the student a strong concept of police ethics as it relates to everyday performance of police duties. The student receives an introduction to problems and strategies for law enforcement officers in their relationships to their marriages and families. Special fees apply. ***Special Conditions: Students must meet basic Police Standards qualifications for police officers.*** (1+0)

LE F115 **Enforcement Skills for Law Enforcement Officers**
3 Credits Offered as Demand Warrants
Introduction to the basic skills necessary to use firearms (both pistol and shotgun), operate a motor vehicle under emergency conditions and use Oleo Capsicum (pepper) spray effectively. A continuum on the use of force, judgment in the use of deadly force, physical defense tactics and physical arrest. Special fees apply. ***Special Conditions: Students must meet basic Police Standards qualifications for police officers.*** (2+8)

LE F120 **Law Enforcement Operations**
4 Credits Offered as Demand Warrants
Preparation to conduct specific investigations into auto theft, domestic violence events, DUI detection, juvenile procedures, care of the emotionally disturbed, report writing and jail procedures. Special fees apply. ***Special Conditions: Students must meet basic Police Standards qualifications for police officers.*** (3+3)

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LE F125 **Basic Police Procedures**
4 Credits Offered as Demand Warrants
Introduction to conducting investigations, using approved methods, at any major crime scene. Specific skills are presented for use in the investigation of sexual assaults, homicides, arson, gang related activity and death investigations. Skills are taught in: interview and interrogation, crime scene physical collection, hostage situations, scene investigation and mapping. Introduction to the danger of blood-bourne pathogens and protective measures. Special fees apply. ***Special Conditions: Students must meet basic Police Standards qualifications for police officers.*** (3+3)

LE F205 **Criminal Law for Police**
4 Credits Offered as Demand Warrants
Introduction to the more complex issues of criminal law. The Alaska Statutes, constitutional law and court decisions as well as traffic law, search and seizure, rights of defendants and warrant procedures. Special fees apply. ***Special Conditions: Students must meet basic Police Standards qualifications for police officers.*** (4+0)

LEADERSHIP

LEAD F305 **Leadership Alaska: Making a Difference** (s)
4 Credits Offered Spring
A leadership seminar and practicum which will involve building community, developing networks, learning leadership theories, understanding civic responsibility, and creating an action through which the student becomes a leader. ***Prerequisites: Either be an Alaska Scholar; an Honors student; a member of the National Society of Collegiate Scholars; have a 3.25 GPA; or permission of instructor.*** (4+0)

LIBERAL ARTS AND SCIENCE

LAS F410 W,O/2 **Scientific Research**
3 Credits Offered as Demand Warrants
Formulation and testing of hypotheses using field observation and experimentation. Includes collection of data, analysis using spreadsheets and statistical software, and oral/written presentation. Focus on individual and group participation in ongoing field or laboratory projects in the natural sciences. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; junior or senior standing as a major in the B.A.S. degree program.*** (2+3)

LAS F601 **Responsible Conduct of Research**
2 Credits
Maintaining the public trust and respect of fellow scientists requires a clear understanding of the basic principles under which research is conducted and reported. Introduces students to the basic principles and expectations that form the foundation of research integrity. Students will learn to recognize and address ethical dilemmas in research scenarios, thus preparing them for situations that will invariably arise during their career. This course fulfills National Science Foundation and National Institutes of Health requirements. ***Prerequisites: Senior undergraduate or graduate student standing. Interested post-doctoral fellows and other with terminal degrees are also invited to enroll with permission of instructor.*** (2+0)

LIBRARY SCIENCE

LS F100X **Library and Information Strategies**
1 Credit Offered Fall
Principles of information organization and how libraries can provide access to information and scholarly resources. Emphasis on use of a library via distance delivery methods. For students who do not have direct physical access to the Rasmuson Library. Also available through the Center for Distance Education. (1+0)

LS F101X **Library Information and Research**
1 Credit
Introduction to effective library research methods and principles of information organization and retrieval. Emphasis on applied experience with finding and evaluating information, especially through use of library catalogs, journal indexes and Internet resources. Also available through the Center for Distance Education. (1+0)

LS F487 **Alaska Research Resources**
2 Credits Offered Spring
Find, use and evaluate primary sources in the Alaska and Polar Regions Department of the Rasmuson library and over the Internet. Student pursues own topics and findings may be used to support research in other courses. Stacked with NORS F687. (2+0)

LINGUISTICS

LING F100 **Language, Education, Linguistics** (h)
3 Credits Offered Spring
Introduction to the field of linguistics as it pertains to the field of education. Includes discussions of language structure, acquisition and bilingualism, and variation and public policy. The course does not satisfy requirements for the B.A. in Linguistics. Cross-listed with ED F100. (3+0)

LING F101 **Nature of Language** (h)
3 Credits Offered Fall
The study of language: systematic analysis of human language and description of its grammatical structure, distribution and diversity. Also available through the Center for Distance Education. (3+0)

LING F216 **Languages of the World** (h)
3 Credits Offered as Demand Warrants
A comprehensive survey of the world's languages — past and present. Topics include genetic relationships among languages, linguistic change, language universals, language classification and language families, as well as the interaction of culture and language. (3+0)

LING F303 W,O **Language Acquisition**
3 Credits Offered as Demand Warrants
Theories of the acquisition and development of first and second languages, including consideration of biological and sociocultural factors. Survey of traditional and contemporary theories, and implications for pedagogy and public policy. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor. Recommended: LING F101.*** Cross-listed with ED F303. (3+0)

LING F308 W,O **Language and Gender** (s)
3 Credits Offered Fall Odd-numbered Years
Examination of relationships between language and gender, drawing on both ethnographic and linguistic sources. Topics include power, socialization and sexism. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** Cross-listed with ANTH F308; WMS F308. (3+0)

LING F318 **Introduction to Phonetics and Phonology** (h)
3 Credits Offered Spring
Scientific study of human speech sounds, mechanism of their production, and sound systems of languages. ***Prerequisites: Upper-division standing or permission of instructor.*** (3+0)

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LING F320 **Introduction to Morphology** (h)
3 Credits Offered Fall Odd-numbered Years
Study of principles and processes of word construction in language. Morphological structure of Alaska Native languages and other non-Indo-European languages. ***Prerequisites: LING F318 or permission of instructor.*** (3+0)

LING F402 **Second Language Acquisition**
3 Credits Offered Fall
Central issues in second language acquisition research. Includes a critical review of SLA theories and research. ***Prerequisites: LING F101 or permission of instructor.*** (3+0)

LING F410 O **Theory and Methods of Second Language Teaching**
3 Credits Offered Fall Even-numbered Years
Theory and methods of teaching a second language, including various pedagogical approaches, overview of second language acquisition theory, discussion of materials and testing. ***Prerequisites: COMM F131X or COMM F141X.*** (3+0)

LING F420 **Semantics** (h)
3 Credits Offered Spring Even-numbered Years
A systematic exploration of the nature of meaning in human language. Focus is on historical and contemporary approaches to understanding problems of reference, categorization and lexical relationships in meaningful contexts. ***Prerequisites: LING F101 or permission of instructor.*** Stacked with LING F620. (3+0)

LING F430 **Historical Linguistics** (h)
3 Credits Offered Fall Even-numbered Years
Introduction to comparative and historical linguistics: methods of linguistic reconstruction, historical change, genetic relationships, dialectology. Includes Indo-European and Alaskan languages. ***Prerequisites: LING F318.*** Stacked with LING F630. (3+0)

LING F431 **Field Methods in Descriptive Linguistics I**
3 Credits Offered Spring Odd-numbered Years
Introduction to general issues in language field work and to issues specific to working with little studied and/or endangered languages in particular. Focus on introduction to writing systems, making recordings, computers and transcriptions, planning consultant sessions, working with consultants, interviewing and ethics in the field. Projects include making transcriptions of familiar language, and later, working on an unfamiliar language with a language consultant, selecting and carrying out a well- defined project, resulting in a term paper. ***Prerequisites: LING F318; LING F320; or permission of instructor.*** Cross-listed with ANTH F432. Stacked with ANTH F632; LING F631. (3+0)

LING F434 **Field Methods in Descriptive Linguistics II**
3 Credits Offered Fall Odd-numbered Years
Second semester of Field Methods sequence. Plan linguistic field project, including field trip, caring for equipment, data handling, community contacts, intellectual property, and repatriation. Course work includes lectures and group elicitation with a speaker of a non-Indo-European language. Projects may involve either the traditional field work involving finding and working with a consultant, or work involving research of archival materials on languages no longer spoken. ***Prerequisites: ANTH F432 or LING F431.*** Cross-listed with ANTH F434. Stacked with ANTH F634; LING F634. (3+0)

LING F440 W **Aspects of Bilingualism** (h)
3 Credits Offered as Demand Warrants
Cognitive, linguistic, sociopolitical and educational aspects of bilingualism at both the individual and societal levels, including factors contributing to language maintenance and language shift. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; LING F101; or permission of instructor.*** (3+0)

LING F450 O **Language Policy and Planning** (s)
3 Credits Offered Fall Even-numbered Years
Consideration of minority languages, including Alaskan Native Languages, in light of their histories, current status and factors affecting future maintenance. ***Prerequisites: COMM F131X or COMM F141X.*** Stacked with LING F650. (3+0)

LING F482 **Seminar in Linguistics**
3 Credits Offered Spring Odd-numbered Years
Current issues in various subfields of linguistics including semantics and pragmatics, discourse analysis, bilingualism, lexicography, language philosophy and issues within a particular language or language group, e.g. Eskimo phonology, Athabaskan morphology. May be repeated once. (3+0)

LING F600 **Research Methods for Applied Linguistics**
3 Credits Offered Spring
Review of quantitative and qualitative research paradigms, data gathering techniques and analytical tools (questionnaires, surveys, observations, testing) used in the study of applied linguistics. Topics will include ethical issues in human subjects research, how to conduct a literature review, how to conduct classroom-based research. ***Prerequisites: Graduate standing.*** (3+0)

LING F601 **Principles of Linguistic Analysis**
3 Credits Offered Fall
Provides experience in working with various languages to determine systematic principles of transcribing and organizing sounds; isolating morphemes; categorizing words into semantic categories; and understanding narrative and other rhetorical structures. For students whose specialty is other than linguistics who could benefit from a graduate-level introduction to linguistic methods. (3+0)

LING F602 **Second Language Acquisition**
3 Credits Offered Fall
Central issues in second language acquisition research. Includes a critical review of SLA theories and research. ***Prerequisites: LING F101 or LING F601; graduate standing; or permission of instructor.*** (3+0)

LING F603 **Phonetics and Phonology**
3 Credits
Scientific approach to the study of human speech sounds and the mechanism of their production (phonetics), as well as the exploration of the fundamental concepts of the sound systems of languages (phonology) and theories which allow for the analysis of real language data. (3+0)

LING F604 **Morphology and Syntax**
3 Credits Offered Fall Even-numbered Years
The study of how meaning is encoded in words in languages of the world. Morphological and morphophonemic processes, lexical categories, derivation and inflection, productivity, tense, aspect, mode, case, concord, valence changes, morphological typologies. Similarities and differences among languages in the grammatical devices used to signal relations between nouns and verbs, negation, comparison, attribution. ***Prerequisites: LING F101 or LING F601; graduate standing; or permission of instructor.*** (3+0)

LING F610 **Theory and Methods of Second Language Teaching**
3 Credits Offered Spring
Theory and practice of teaching a second language, including methodological approaches, second language acquisition theory, materials, and testing. (3+0)

LING F611 **Second Language Curriculum and Materials Development**
3 Credits Offered Fall Even-numbered Years
Exploration/discussion of theoretical perspectives in Second Language curriculum and materials development. Emphasis on the interconnectivity of materials, syllabus, curriculum and learning. As a result of this course, students will be able to choose, adapt and construct a variety of language teaching materials and understand the ramifications of syllabus and curriculum design. ***Prerequisites: LING F602; LING F610. Recommended: LING F601.*** (3+0)

LING F612 **Assessment for the Second Language Classroom**
3 Credits Offered Spring Odd-numbered Years
Exploration/discussion of theoretical perspectives in second language assessment, practical considerations in creating language tests, and statistical methods used for analyzing test data. As a result of this course, students will be able to choose, adapt and construct a variety of language assessments for

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classroom and institutional purposes as well as evaluate the validity of existing assessments. ***Prerequisites: LING F602; LING F610. Recommended: LING F601.*** (3+0)

LING F620 Semantics
3 Credits Offered Spring Even-numbered Years
A systematic exploration of the nature of meaning in human language. Focus is on historical and contemporary approaches to understanding problems of reference, categorization and lexical relationships in meaningful contexts. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with LING F420. (3+0)

LING F621 Cultural Aspects of Language Acquisition
3 Credits
An expended view of the ways in which individuals become socialized into particular patterns of first and second language and literacy. The ongoing acquisition of both oral and written language(s) from early childhood through adult life. Topics will include the cultural dimensions of language development, the relationship between communication and culture, bilingualism and the role of language in the transmission of sociocultural knowledge. Cross-listed with ED F621. (3+0)

LING F627 Introduction to Linguistic Description and Documentation
3 Credits Offered Fall Even-numbered Years
General introduction to lexicography, field phonetics, grammatical documentation, investigation of narrative, other levels of linguistic documentation, the distinction between description and documentation, and differences in structure and method between pedagogical and academic materials resulting from field work. ***Prerequisites: LING F601 or equivalent; demonstrated background in phonology and morphology; or permission of instructor.*** (3+0)

LING F630 Historical Linguistics
3 Credits Offered Spring Even-numbered Years
Introduction to comparative and historical linguistics: methods of linguistic reconstruction, historical change, genetic relationships, dialectology. Includes Indo-European and Alaskan languages. ***Prerequisites: LING F318.*** Stacked with LING F430. (3+0)

LING F631 Field Methods in Descriptive Linguistics I
3 Credits Offered Spring Odd-numbered Years
Introduction to general issues in language field work and to issues specific to working with little studied and/or endangered languages in particular. Focus on introduction to writing systems, making recordings, computers and transcriptions, planning consultant sessions, working with consultants, interviewing, and ethics in the field. Projects include making transcriptions of familiar language, and later, working on an unfamiliar language with a language consultant, selecting and carrying out a well- defined project, resulting in a term paper. ***Prerequisites: LING F627 or permission of instructor.*** Cross-listed with ANTH F632. Stacked with ANTH F432; LING F431. (3+0)

LING F634 Field Methods in Descriptive Linguistics II
3 Credits Offered Fall Odd-numbered Years
Second semester of Field Methods sequence. Plan linguistic field project, including field trip, caring for equipment, data handling, community contacts, intellectual property and repatriation. Course work includes lectures and group elicitation with a speaker of a non-Indo-European language. Projects may involve either traditional field work involving finding and working with a consultant, or work involving research of archival materials on languages no longer spoken. ***Prerequisites: ANTH F632 or LING F631.*** Cross-listed with ANTH F634. Stacked with ANTH F434; LING F434. (3+0)

LING F650 Language Policy and Planning
3 Credits Offered Fall Odd-numbered Years
Consideration of minority languages, including Alaska Native Languages, in light of their histories, current status, and factors affecting future maintenance. Stacked with LING F450. (3+0)

LING F651 Topics in Athabascan Linguistics
3 Credits Offered Fall Even-numbered Years
Graduate level introduction to important topics in Athabascan linguistics, including both foundational literature and current research. Topics may include laryngeal features; tonogenesis; syntax-morphology interface; argument structure; lexical semantics; and discourse. Course may be repeated once. ***Prerequisites: LING F601 or equivalent; graduate standing. Recommended: LING F603; LING F604.*** Cross-listed with ANL F651. (3+0)

LING F652 Linguistics Applications
3 Credits
In-depth investigation of linguistic problems in selected languages. Includes phonological, morphological, syntactic and semantic issues. Students will produce a grammatical sketch of a chosen language. ***Prerequisites: LING F318; LING F320; LING F601; or relevant course work.*** (3+0)

LING F660 Internship
3 Credits Offered Fall Even-numbered Years
Student works as an apprentice to a language teacher or a linguist doing fieldwork. Maintain a log and a portfolio of work. If teaching, goal would be to develop appropriate lesson plans and do mentored teaching. If doing fieldwork, goal would be to develop appropriate materials for teaching. ***Prerequisites: LING F603; LING F604; ANTH F632 or LING F610.*** (3+0)

MARINE SCIENCE AND LIMNOLOGY

MSL F111X The Oceans (n)
4 Credits
Study of the oceans from the broad perspective offered by combining insights from biology, physics, chemistry and geology. Topics include the evolution of the oceans and marine life, forces acting on water and the resulting currents and waves, and relationships between the physics and chemistry of water bodies and their biological productivity. Societal questions related to fisheries management, global climate change and pollution will be discussed. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+3)

MSL F220 Scientific Diving
2 Credits Offered Spring
Introduction to cold water diving and SCUBA techniques used in the research community. Includes familiarization with Alaska subtidal flora and fauna. Opportunity to work underwater and assist with diving projects conducted by MSL F421 students at the Kasitsna Bay Marine Lab during spring break. Completion of this course will allow students to be eligible to join the UAF (AAUS) dive program and to dive on the UAF sanctioned diving projects and have reciprocity to dive with other universities and other government agencies. Through this course, students also can be certified with a Research Diver Specialty (PADI) and a Dry Suit Specialty (PADI). CPR, First Aid (Red Cross), and Emergency Oxygen Administration (DAN) are offered through this course. Graded Pass/Fail. Special fees apply. ***Prerequisites: Basic biology/ecology courses, SCUBA (open water) certification. Special Conditions: Must have current SCUBA physical approved.*** (1+1+8)

MSL F411 Current Topics in Oceanographic Research
3 Credits
Study of research problems from biology, chemistry, geology and physics. Topics include sea floor hydrothermal vents and their indigenous communities, manganese nodules, tsunami prediction, radioisotopes in the sea, Bering Sea productivity and the role of the ocean in global warming due to fossil fuel carbon dioxide. ***Prerequisites: Four semesters of natural sciences at F100-level or above or permission of instructor.*** (3+0)

MSL F421 Field Course in Subtidal Studies
2 Credits Offered Spring
Students will propose a hypothesis and experimentally test it during a one-week field trip to the Kasitsna Bay Lab. Prior to field trip, students will

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develop a proposal, dive plan and materials list in relation to their project. Undergraduates will present their findings in an oral presentation to the class while graduate students will present theirs in a public seminar and produce a conference-ready poster. Special fees apply. ***Prerequisites: MSL F420, basic biology/ecology courses, SCUBA (open water) certification. Special Conditions: Must have a current SCUBA physical approved.*** Stacked with MSL F623. (1+1+8)

MSL F431 **Polar Marine Science**
3 Credits Offered Fall Even-numbered Years
Physical, biological, chemical and geological oceanography of the polar oceans with emphasis on comparing and contrasting the Arctic and Antarctic. ***Prerequisites: MSL F111; or graduate standing.*** (3+0)

MSL F435 **Acoustical Oceanography**
3 Credits
Principles and applications of underwater sound in solving oceanographic problems related to chemistry, physics, geology and biology, including hydroacoustical methods, acoustical phenomena, bioacoustics and fisheries acoustics, environmental noise and signal processing. ***Prerequisites: College physics and calculus.*** (3+0)

MSL F450 **Marine Biology and Ecology Field Course**
4 Credits Offered Summer Odd-numbered Years; As Demand Warrants
Advanced understanding of marine organisms in an ecological and evolutionary context through field and laboratory work at the Kasitsna Bay Marine Lab. Includes collection of marine macroalgae, invertebrates and plankton and relating their anatomical organization to habitat, lifestyle and ecology. Emphasis on familiarization with Alaska's nearshore flora and fauna, the ecological function of organisms and ecosystem dynamics. Includes employing different field sampling techniques and experimental designs in various habitats found around the Kasitsna Bay Marine Lab, e.g. rocky intertidal, open water, mudflats, seagrass beds and salt marshes. ***Prerequisites: One year of biology and permission of instructor. Recommended: Basic courses in ecology and invertebrate zoology.*** Stacked with MSL F651. (3+6)

MSL F456 **Kelp Forest Ecology**
4 Credits Offered Summer Even-numbered Years; As Demand Warrants
Introduction to knowledge, hypotheses and disputes regarding components of nearshore tidal communities and the ecological interactions that influence their structure and dynamics. Includes primary published literature in marine subtidal ecology, and local Alaska subtidal flora and fauna. Work underwater conducting ecological research. Includes formulating questions, collecting and analyzing ecological data, report writing and feedback. Special fees apply. ***Prerequisites: UAF Science Diver certification.*** Stacked with MSL F656. (28+35)

MSL F460 **Marine Studies for Science Teachers**
1-3 Credits
Field studies in oceanography and marine biology emphasizing a hands-on approach to scientific observation, data collection and analysis. Small boat and beach excursions. Students may enroll for one, two, or three weeks at 1 credit per week. Two additional credits may be earned by students concurrently enrolled in MSL F498 and completing their own investigative research project. Course offered at the Kasitsna Bay Laboratory. Special fees apply. ***Prerequisites: B.S. or B.A. degree; college-level science background; or permission of instructor(s).*** (1-3+0)

MSL F467 **Introduction to Marine Macroalgae** (n)
3 Credits Offered as Demand Warrants
Introduction to marine macroalgae. Algal structure, function and ecology, basic knowledge of the major phyla, key and press algae, and local Alaska flora. Includes a four to five day field trip to Kasitsna Bay Marine Laboratory. Special fees apply. ***Prerequisites: Upper-division standing in a natural science for undergraduates or graduate standing.*** Stacked with MSL F667. (2+3)

MSL F601 **Professional Development**
1 Credit Offered Fall
Improve ability to make oral and poster presentations and to write resumes and cover letters. Includes lectures, discussions, and four individual projects. Students are encouraged to use their thesis/dissertation material for the posters and oral presentations. Feedback on all projects will be given by both instructor and students. ***Recommended: Graduate status.*** (1+0)

MSL F602 **Proposal Writing**
1 Credit Offered Fall; As Demand Warrants
Familiarize students with the proposal writing process. Writing proposals is a common requirement during graduate school and will be continuing during the career as a scientists and researcher. This class aims to cover some common rules about good proposal writing. Students will be required to write a proposal and to give feedback to 1-2 proposals of classmates. Graded Pass/Fail. ***Recommended: Graduate status.*** (1+0)

MSL F604 **Modern Applied Statistics for Fisheries**
4 Credits Offered Odd-numbered Years
Covers general statistical approaches to quantitative problems in marine science and fisheries with guidance on how to collect and organize data, how to select appropriate statistical methods and how to communicate results. A variety of advanced statistical methods for analyzing environmental data sets will be illustrated in theory and practice. ***Prerequisites: STAT F200; STAT F401; proficiency in computing with R or permission of instructor.*** Cross-listed with: FISH F604. (3+3)

MSL F605 **Controversies in Marine Science**
1 Credit Offered Spring Even-Numbered Years
Introduction to the idea that science is fluid and controversies and disagreements do occur. These disagreements are often published in the primary literature. This course will be a discussion/debate of various controversial topics in marine science. Graded Pass/Fail. ***Recommended: Graduate status.*** (1+0)

MSL F610 **Marine Biology**
3 Credits Offered Spring
Biology of the major plant and animal groups in the sea and their roles in pelagic and benthic systems. Physical, chemical and geological features affecting marine organisms and the role of bacteria in the sea. The basic biology and adaptations of selected species of zooplankton and nekton. The benthos-shore biota, shelf and deep-sea organisms: basic biology, trophic roles and adaptations of selected species. ***Prerequisites: Degree in biology or permission of instructor. Recommended: Courses in invertebrate zoology, ichthyology, and vertebrate zoology.*** (3+0)

MSL F611 **Field Problems in Marine Biology**
5 Credits
Study of pelagic and benthic ecosystems emphasizing distribution, abundance and ecology of dominant species. Students will also complete a research project of their own choosing. Five-week course offered at the Kasitsna Bay Laboratory. ***Prerequisites: Graduate standing or permission of instructor; invertebrate zoology or equivalent.*** (5+0)

MSL F615 **Physiology of Marine Organisms**
3 Credits
A study of the physiological systems of and adaptation to the marine environment, intertidal, pelagic, and deep benthos environment and energy flows will be discussed. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

MSL F616 **Metabolic Physiology**
3 Credits Offered as Demand Warrants
Integrates organismal and cellular aspects of vertebrate metabolism thus it represents an amalgam of biochemistry, cellular physiology and comparative animal physiology. Detail and intensity devoted to the various topics of metabolism will be tailored to the research interests of the class. ***Recommended: Undergraduate Biochemistry course and Physiology or Cellular Biology course.*** (3+0)

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MSL F617 **Marine Mammal Management**
3 Credits Offered as Demand Warrants
Practical current issues related to marine mammals in Alaska and other parts of the world. Legal agreements affecting marine mammals such as the U.S. Marine Mammal Protection Act, the Endangered Species Act, the Convention on International Trade in Endangered Species, the the Magnuson-Stevens Fisheries Conservation Act and the history and actions of such groups as the International Whaling Commission will be reviewed. Current marine mammal management policies in the U.S. and other countries will be discussed and compared. Other current management issues that may be explored in relation to marine mammals are: contaminants, habitat issues, interactions with fisheries and subsistence hunting. ***Recommended: Genetics, populations dynamics and general ecology courses.*** (3+0)

MSL F619 **Biology of Marine Mammals**
3 Credits Offered as Demand Warrants
Introduction to a broad range of research and conservation topics associated with marine mammals. Topics include physiological adaptations, phylogeny and evolution, behavior, ecology, population dynamics and conservation. ***Prerequisites: Graduate standing; or upper-division ecology and biology courses.*** (3+0)

MSL F620 **Physical Oceanography**
4 Credits Offered Fall
Physical description of the sea, physical properties of seawater, methods and measurements, boundary processes, currents, tides and waves, and regional oceanography. ***Prerequisites: Math F202X; PHYS F103X or PHYS F211X; science or engineering degree; or permission of instructor.*** (3+3)

MSL F621 **Polar Marine Science**
3 Credits Offered Fall Even-numbered Years
Physical, biological, chemical and geological oceanography of the polar oceans with emphasis on comparing and contrasting the Arctic and Antarctic. ***Prerequisites: MSL F620; or graduate standing.*** (3+0)

MSL F623 **Field Course in Subtidal Studies**
2 Credits Offered Spring
Students will propose a hypothesis and experimentally test it during a one-week field trip to the Kasitsna Bay Lab. Prior to field trip, students will develop a proposal, dive plan and materials list in relation to their project. Undergraduates will present their findings in an oral presentation to the class while graduate students will present theirs in a public seminar and produce a conference-ready poster. Special fees apply. ***Prerequisites: MSL F420; basic biology/ecology courses; SCUBA (open water) certification. Special Conditions: Must have a current SCUBA physical approved.*** Stacked with MSL F421. (1+1+8)

MSL F624 **Oceanic-Atmospheric Gravity Waves**
3 Credits Offered Spring; As Demand Warrants
Introduction to the dynamics of surface and internal gravity waves in non-rotating and rotating fluids including, derivation/solutions of the wave equation, approximations to the governing equations, particle motions and wave energetics, dispersion relationships, phase and group velocities, normal mode and WKB theory, refraction, reflection, critical layer absorption, wave instabilities. ***Prerequisites: MSL F620; MATH F302; or permission of instructor.*** Cross-listed with ATM F624. (3+0)

MSL F625 **Shipboard Techniques**
3 Credits Offered as Demand Warrants
Introduction to modern oceanographic shipboard sampling and analysis techniques. (2+3)

MSL F626 **Continental Shelf Dynamics**
3 Credits Offered as Demand Warrants
Geophysical fluid dynamic fundamentals appropriate to continental shelf circulation. Steady and time-dependent wind and buoyancy-forced flows in the presence of stratification and bathymetry. ***Prerequisites: MSL F620; MATH F421.*** (3+0)

MSL F627 **Statistical Computing with R**
2 Credits Offered Alternate Fall, As Demand Warrants
Using the free, open-source software R to teach computing, programming, and modeling concepts for the statistical analysis of fisheries and biological data. Prepares students for other graduate-level, quantitative fisheries courses and covers exploratory statistical and graphical analyses, as well as computer-intensive methods such as bootstrapping and randomization tests. ***Prerequisites: STAT F200X or equivalent, STAT F401 or equivalent, and proficiency with Excel; or permission of instructor.*** Cross-listed with FISH F627. (1+3)

MSL F628 **Sea Ice Ecology**
1 Credit Offered as Demand Warrants
Provides students with an introduction into the physics, chemistry and biology of Arctic and Antarctic sea ice. Topics will include seasonality of sea ice extent, ice microstructure, diversity and activity of biological communities and impacts of climate change on the ice biota. ***Recommended: MSL F650.*** (1+0)

MSL F629 **Methods of Numerical Simulation in Geophysical Fluid Dynamics**
4 Credits Offered Fall Odd-numbered Years
Fundamentals of computer simulation, including time and spatial differencing and stability theory applied to partial differential equations describing dynamic processes in the ocean and atmosphere. Numerical approximation schemes for geophysical fluid dynamics will be analyzed through equations of motion, continuity and transport. Special consideration given to description of frictional processes in turbulent flow and transport/diffusion phenomena. Includes laboratory practice. ***Prerequisites: MATH F310; MATH F421; MATH F422 or equivalent; baccalaureate degree in physics, engineering, mathematics or equivalent; experience with FORTRAN.*** (3+3)

MSL F630 **Geological Oceanography**
3 Credits Offered Spring
Topography and structure of the ocean floor. Theory of plate tectonics. Geology of ocean basins, continental slope, shelf and coastal environments. Major sediment types and distributions. Sediment transport and deposition. Interaction between seawater, rock, and sediment. Paleoceanography. ***Prerequisites: Graduate standing or permission of instructor. Upper-division standing are invited to contact the instructor.*** (3+0)

MSL F640 **Fisheries Oceanography**
4 Credits Offered Fall Odd-numbered Years
Oceanography of marine processes affecting commercially important fisheries (finfish and shellfish) and species that affect them. Interactions between fisheries resources and physical, biological, geological and chemical oceanography, as well as climatological and meteorological conditions. Topics include recruitment, transport, natural mortality, predator-prey relationships, competition, distribution and abundance. El Niño/La Niña, regime shifts, and climate change. Emphasis on early life history of fishes. Examples from fisheries and ecosystems worldwide are used. ***Prerequisites: MSL F620; MSL F650; or permission of instructor. Recommended: FISH F400.*** (4+0)

MSL F650 **Biological Oceanography**
3 Credits Offered Fall
Survey of biological processes emphasizing organic matter synthesis and transfer including topics essential to a basic understanding of contemporary biological oceanography. Primary and secondary production, standing stocks, distribution, and structure and dynamics of phytoplankton and zooplankton populations. The transfer of organic matter to higher trophic levels and food webs. Nutrient cycling, especially but not exclusively nitrogen, phosphorus and silicon, microbiological processes relevant to nutrient cycling. Heterotrophic production, benthic communities coastal ecosystems, the influence of organisms on the composition of seawater, particularly with reference to oxygen and carbon dioxide regimes. Aspects of regional oceanography. ***Prerequisites: Upper-division standing in a science major.*** (3+0)

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MSL F651 **Marine Biology and Ecology Field Course**
4 Credits Offered Summer Odd-numbered Years; As Demand Warrants
Advanced understanding of marine organisms in an ecological and evolutionary context through field and laboratory work at the Kasitsna Bay Marine Lab (Kachemak Bay). Includes collection of marine macroalgae, invertebrates and plankton and relating their anatomical organization to habitat, lifestyle and ecology. Emphasis will be on familiarization with Alaska's nearshore flora and fauna, the ecological function of organisms and ecosystem dynamics. Students will employ different field sampling techniques and experimental designs in various habitats found around the Kasitsna Bay Marine Lab, e.g. rocky intertidal, open water, mudflats, seagrass beds, and salt marshes. Graduate students will perform a research project related to the course subject matter. ***Prerequisites: One year of biology; graduate standing; permission of instructor. Recommended: Basic courses in ecology and invertebrate zoology.*** Stacked with MSL F450. (3+6)

MSL F652 **Marine Ecosystems**
3 Credits Offered Spring Even-numbered Years
Understanding ecosystems of the sea in the context of evaluating the impact of human activities. Focus on current concepts, trends and perspectives. ***Prerequisites: BIOL F472; MSL F620; MSL F650; or permission of instructor.*** (3+0)

MSL F653J **Zooplankton Ecology**
3 Credits Offered Fall Odd-numbered Years
Survey of marine zooplankton including processes and variables which influence their production and dynamics. Emphasis on the northeast Pacific ocean zooplankton community. Field and lab methods for sampling include fixing, preserving, subsampling, identifying and quantifying zooplankton collections. Laboratory techniques for culture of zooplankton include physiological measurements of bioenergetic parameters. Course is taught in Juneau. ***Prerequisites: Invertebrate zoology course, MSL F610, or permission of instructor.*** Cross-listed with FISH F653J. (3+0)

MSL F654 **Benthic Ecology**
3 Credits Offered Spring Odd-numbered Years
Ecology of marine benthos, from subtidal to hadal zone. Methods of collecting, sorting, narcotizing, preserving and analyzing bethnic assemblages, including video analytical techniques from submersibles and ROV's. Hydrothermal vent and cold seep assemblages. Physiology/energetics of benthic organisms, including animal-sediment relationships, feeding, reproduction and growth. Depth, spatial and latitudinal distribution patterns. ***Prerequisites: Invertebrate zoology course, marine biology course, or permission of instructor.*** (3+0)

MSL F654J **Benthic Ecology**
3 Credits Offered Spring Odd-numbered Years
Ecology of marine benthos, from subtidal to hadal zones. Methods of collecting, sorting, narcotizing, preserving and analyzing benthic assemblages, including video analytical techniques from submersibles and ROV's. Hydrothermal vent and cold seep assemblages. Physiology/energetics of benthic organisms, including animal-sediment relationships, feeding, reproduction and growth. Depth, spatial and latitudinal distribution patterns. ***Prerequisites: Invertebrate zoology course; marine biology course; or permission of instructor.*** Cross-listed with FISH F654J. (3+0)

MSL F655 **Phytoplankton Ecology, from Form to Function**
2 Credits Offered Spring Even-numbered Years
Introduction to the diversity and functioning of aquatic (marine and limnic) phytoplankton taxa in a wide sense. Topics will include various adaptations to the environment (life cycles, physiology). Four lab sessions will intensify the understanding of the covered topics and give students hands-on experience in analyzing phytoplankton samples on algal diversity and activity using modern techniques (fluorescence microscopy, flow cytometry, PAM fluorometry). ***Recommended: Biological oceanography and/or graduate courses in algal ecology and aquatic ecosystems.*** (1+2)

MSL F656 **Kelp Forest Ecology**
4 Credits Offered Summer Even-numbered Years; As Demand Warrants
Introduction to knowledge, hypotheses and disputes regarding components of nearshore tidal communities and the ecological interactions that influence their structure and dynamics. Includes primary published literature in marine subtidal ecology, and local Alaska subtidal flora and fauna. Work underwater conducting ecological research. Includes formulating questions, collecting and analyzing ecological data, report writing and feedback. Special fees apply. ***Prerequisites: UAF Science Diver certification.*** Stacked with MSL F456. (28+35)

MSL F660 **Chemical Oceanography**
3 Credits Offered Spring
The chemical, biological and physical processes that determine the distribution of chemical variables in the sea. The distribution of stable and radioisotopes are used to follow complex chemical cycles, with particular emphasis on the cycles of nutrient elements. The chemistry of carbon is considered in detail. Implications of the mid-ocean ridge vent system to ocean chemistry are examined. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with CHEM F660. (3+0)

MSL F661 **Stable Isotope Techniques in Environmental Research**
3 Credits Offered Spring Even-numbered Years
An examination of the use of added or naturally occurring isotope tracers in ecological studies. Demonstration of equipment and modern techniques. ***Prerequisites: MSL F660 or permission of instructor.*** (3+0)

MSL F667 **Introduction to Marine Macroalgae**
3 Credits Offered as Demand Warrants
Introduction to marine macroalgae. Includes algal structure, function and ecology, basic knowledge of the major phyla, key and press algae and local Alaska flora. Includes a four to five day field trip to Kasitsna Bay Marine Laboratory. Special fees apply. ***Prerequisites: Upper-division standing in a natural science for undergraduates or graduate standing.*** Stacked with MSL F467. (2+3)

MSL F670 **Nutrient Dynamics**
2 Credits Offered Fall Odd-numbered Years
The dynamics of nitrogen, phosphorus and silicon cycles of the world oceans and the specific processes which transfer nutrients between ecosystems compartments. Analytical techniques employed in measurement of nutrient transfer rates. ***Prerequisites: MSL F650 or MSL F660 or permission of instructor.*** (2+0)

MATHEMATICS

Developmental Mathematics

DEVM F050 **Prealgebra**
3 Credits
Operations with whole numbers, fractions, decimals, percents and ratios, signed numbers, evaluation of algebraic expressions and evaluation of simple formula. Metric measurement system and geometric figures. Also available through the Center for Distance Education. ***Prerequisites: Appropriate placement test scores.*** (3+0)

DEVM F051 **Math Skills Review**
1 Credit Offered as Demand Warrants
Develops and reviews basic mathematical terminology, theory and operations as outlined by the Alaska State Mathematics Standards. Mathematics topics focus on reviewing the six basic "strands" of mathematical content: numeration, measurement, estimation and computation, function and relationship, geometry, and statistics and probability. Approaches to problem solving will emphasize the process of mathematical thinking, communication and reasoning. It is an appropriate course for those preparing for the High School

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Qualifying Exam in Alaska or those needing a review of basic math skills in preparation for a math placement test at UAF. May be repeated for a total of three credits. Graded Pass/Fail. (1+0)

DEVM F056 **Math Fast Track: Prealgebra/Elementary Algebra Review**
1 Credit Offered 3 times per year: Augustmester, Wintermester, Maymester
A 20-hour intensive review of math concepts offered prior to each semester. Covers prealgebra and elementary algebra topics to prepare qualified students to potentially improve their math course placement. Students should have a history of being successful in equivalent levels of math, although they may not recall enough information to place well on the placement test. Students who are successful in this class have the possibility of advancing through one or two semesters of development math. Graded Pass/Fail. ***Prerequisites: Placement into DEVM F050 or DEVM F060.*** (1+0)

DEVM F060 **Elementary Algebra**
3 Credits
First year high school algebra. Evaluating and simplifying algebraic expressions, solving first degree equations and inequalities, integer exponents, polynomials, factoring, rational expressions, equations and graphs of lines. Also available through the Center for Distance Education. ***Prerequisites: Grade of C or better in DEVM F050; or ABUS F155, or appropriate placement test scores. Prerequisite courses and/or placement exams must be taken within one calendar year prior to commencement of the course.*** (3+0)

DEVM F061 **Review of Elementary Algebra**
1 Credit
Designed to assist students in reviewing material covered by DEVM F060. Individuals who have not previously taken an elementary algebra course are recommended to enroll in DEVM F060. Available via Independent Learning only. (1+0)

DEVM F062 **Alternative Approaches to Math: Elementary Algebra**
3 Credits
Algebraic topics. Includes operations with polynomial expressions, first- and second-degree equations, graphing, integral and relational exponents, and radicals using alternative teaching styles. ***Prerequisites: Grade of C or better in DEVM F050; or ABUS F155; or appropriate placement test scores. Prerequisite courses and/or placement exams must be taken within one calendar year prior to commencement of the course.*** (3+0)

DEVM F065 **Mathematics Skills**
1-3 Credits
Designed to assist students in reviewing and reinforcing course concepts covered by DEVM F050, DEVM F060, DEVM F062, DEVM F105 and DEVM F106. Consists of instruction which may include lab instruction, individual student work or group work. May be repeated. Recommended for students who need more time and help to master the material in Developmental Math courses. (1-3+0)

DEVM F066 **Advanced Math Fast Track: Elementary/ Intermediate Algebra Review**
1 Credit Offered 3 times per year: Augustmester, Wintermester, Maymester.
A 20-hour intensive review of math concepts offered prior to each semester. Covers elementary and intermediate algebra topics to prepare qualified students to potentially improve their math course placement. Students should have a history of being successful in equivalent levels of math, although they may not recall enough information to place well on the placement test. Students who are successful in this class have the possibility of advancing through one or two semesters of development math. Graded Pass/Fail. ***Prerequisites: Placement into DEVM F060 or DEVM F105 or DEVM F106.*** (1+0)

DEVM F071 **Review of Intermediate Algebra**
1 Credit
Course reviews material covered by DEVM F105. Individuals who have not taken an intermediate algebra course on the high-school level are recommended to enroll in DEVM F105. Available via Independent Learning only. (1+0)

DEVM F081 **Review of Basic Geometry**
1 Credit
High school geometry without formal proofs. Topics include basic definitions, measurement, parallel lines, triangles, polygons, circles, area, solid figures and volume. Available via Independent Learning only. ***Prerequisites: DEVM F060.*** (1+0)

DEVM F082 **Hands-On Geometry**
1 Credit
Basic concepts and uses of geometry. Emphasis on "hands-on" and applied problems. ***Prerequisites: A solid knowledge of arithmetic — no algebra required.*** (1+0)

DEVM F105 **Intermediate Algebra**
3 Credits
Second year high school algebra. Operations with rational expressions, radicals, rational exponents, logarithms, inequalities, quadratic equations, linear systems, functions, Cartesian coordinate system and graphing. To matriculate to MATH F107X from DEVM F105 a grade of B or higher is required. Also available through the Center for Distance Education. ***Prerequisites: Grade of C or better in DEVM F060; or DEVM F062; or appropriate placement test scores. Prerequisite courses and/or placement exams must be taken within one calendar year prior to commencement of the course.*** (3+0)

DEVM F106 **Intensive Intermediate Algebra**
4 Credits
Algebraic topics. Includes exponents, radicals, graphing, systems of equations, quadratic equations and inequalities, logarithms and exponentials, and complex numbers using alternative teaching styles. Note: This course satisfies elective credit only. ***Prerequisites: Grade of C or better in DEVM F060; or DEVM F062; or DEVM F105; or appropriate placement test scores. Prerequisite courses and/or placement exams must be taken within one calendar year prior to commencement of the courses.*** (4+0)

Mathematics

MATH F103X **Concepts and Contemporary Applications of Mathematics** (m)
3 Credits
Applications of mathematics in modern society. Topics include voting systems, probability and statistics and applications of graph theory in management science; uses of probability and statistics in industry, government and science; and applications of geometry to engineering and astronomy. Problem solving emphasized. Also available through the Center for Distance Education. ***Prerequisites: DEVM F105 or DEVM F106 or placement; or high school geometry and algebra II.*** (3+0)

MATH F107X **Functions for Calculus** (m)
4 Credits
A study of algebraic, logarithmic and exponential functions; sequences and series; conic sections; and as time allows, systems of equations, matrices and counting methods. A brief review of basic algebra in the first week prepares students for the rigor expected. The primary purpose of this course, in conjunction with MATH F108, is to prepare students for calculus. Note: Credit may be earned for taking MATH F107X or MATH F161X, but not for both. Also available through the Center for Distance Education. ***Prerequisites: DEVM F105 with a grade of B (3.0) or higher; DEVM F106; or two years of high school algebra and MATH F107X placement or higher.*** (4.5+0)

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MATH F108 **Trigonometry** (m)
2-3 Credits
A study of the trigonometric functions. Also available through the Center for Distance Education. ***Prerequisites: MATH F107X or placement or concurrent enrollment in MATH F107X.*** (2-3+0)

MATH F161X **Algebra for Business and Economics** (m)
3 Credits
Functions of one and several variables with attention to linear, polynomial, rational, logarithmic and exponential relationships. Geometric progressions as applied to compound interest and present value. Linear systems of equations and inequalities. Note: Credit may be earned for taking MATH F107X or MATH F161X, but not for both. ***Prerequisites: DEVM F105 or DEVM F106 with a grade of B (3.0) or higher or two years of high school algebra and MATH F161X placement or higher.*** (3+0)

MATH F200X **Calculus I** (m)
4 Credits
Limits, including those with indeterminate form, continuity, tangents, derivatives of polynomial, exponential, logarithmic and trigonometric functions, including product, quotient and chain rules, and the mean value theorem. Applications of derivatives including graphing functions and rates of change. Antiderivatives, Newton's method, definite and indefinite integrals, methods for substitution in integrals and the fundamental theorem of calculus. Applications of integrals include areas, distances, and volumes. Note: No credit may be earned for more than one of MATH F200X, MATH F262X or MATH F272X. Also available through the Center for Distance Education. ***Prerequisites: MATH F107X and MATH F108 or placement for MATH F200X.*** (4+1)

MATH F201X **Calculus II** (m)
4 Credits
Techniques and applications of integration. Integration of trigonometric functions, volumes including those using slicing, arc-length, integration by parts, trigonometric substitutions, partial fractions, hyperbolic functions, and improper integrals. Numeric integration including Simpson's rule, first order differential equations with applications to population dynamics and rates of decay, sequences, series, tests for convergence including comparison and alternating series tests, conditional convergence, power series, Taylor series, polar coordinates including tangent lines and areas, and conic sections. Also available through the Center for Distance Education. ***Prerequisites: MATH F200X or placement in MATH F201X.*** (4+0)

MATH F202X **Calculus III** (m)
4 Credits
Partial derivatives and multiple integrals (double and triple). Vectors, parametric curves, motion in three dimensions, limits, continuity, chain rule, tangent planes, directional derivatives, optimization, Lagrange multipliers, integrals in polar coordinates, parametric surfaces, Jacobians, line integrals, Green's Theorem, surface integrals and Stokes' Theorem. Also available through the Center for Distance Education. ***Prerequisites: MATH F201X.*** (4+0)

MATH F205 **Mathematics for Elementary School Teachers I** (m)
3 Credits Offered Fall
Elementary set theory, numeration systems, and algorithms of arithmetic, divisors, multiples, integers and introduction to rational numbers. Emphasis on classroom methods. Also available through the Center for Distance Education. ***Prerequisites: MATH F107X, MATH F161X or placement. Restricted to B.A.S. and B.A. Elementary Education degree students; others by permission of instructor.*** (3+1)

MATH F206 **Mathematics for Elementary School Teachers II** (m)
3 Credits Offered Spring
A continuation of MATH F205. Real number systems and subsystems, logic, informal geometry, metric system, probability and statistics. Emphasis on classroom methods. Also available through the Center for Distance Education. ***Prerequisites: MATH F205.*** (3+1)

MATH F215 **Introduction to Mathematical Proofs** (m)
2 Credits Offered Spring
Emphasis on proof techniques with topics including logic, sets, relations, equivalence, induction, number theory, graph theory and congruence classes. In addition, a rigorous treatment of topics from calculus may be included. ***Prerequisites: MATH F200X, MATH F201X or concurrent with MATH F201X or permission of instructor.*** (2+0)

MATH F262X **Calculus for Business and Economics** (m)
4 Credits
Ordinary and partial derivatives. Maxima and minima problems, including the use of Lagrange multipliers. Introduction to the integral of a function of one variable. Applications include marginal cost, productivity, revenue, point elasticity of demand, competitive/complementary products, consumer's surplus, etc. Note: No credit may be earned for more than one of MATH F200X, MATH F262X or MATH F272X. ***Prerequisites: MATH F161X or placement.*** (4+0)

MATH F272X **Calculus for Life Sciences** (m)
3 Credits Offered Fall
Differentiation and integration with applications to the life sciences. Note: No credit may be earned for more than one of MATH F200X, MATH F262X or MATH F272X. ***Prerequisites: MATH F107X and MATH F108 or placement.*** (3+0)

MATH F302 **Differential Equations**
3 Credits
Nature and origin of differential equations, first order equations and solutions, linear differential equations with constant coefficients, systems of equations, power series solutions, operational methods, and applications. ***Prerequisites: MATH F202X.*** (3+0)

MATH F305 **Geometry**
3 Credits Offered Spring Even-numbered Years
Topics selected from such fields as Euclidean and non-Euclidean plane geometry, affine geometry, projective geometry, and topology. ***Prerequisites: MATH F202X and MATH F215 or permission of instructor.*** (3+0)

MATH F306 **Introduction to the History and Philosophy of Mathematics**
3 Credits Offered Spring Odd-numbered Years
Important periods of history as exemplified by such thinkers as Plato, B. Russell, D. Hilbert, L.E.J. Brouwer and K. Godel. For students of mathematics, science, history and philosophy. ***Prerequisites: MATH F202X or permission of instructor.*** (3+0)

MATH F307 **Discrete Mathematics**
3 Credits
Logic, counting, sets and functions, recurrence relations, graphs and trees. Additional topics chosen from probability theory. ***Prerequisites: MATH F201X or permission of instructor.*** Cross-listed with CS F307. (3+0)

MATH F310 **Numerical Analysis**
3 Credits Offered Fall
Direct and iterative solutions of systems of equations, interpolation, numerical differentiation and integration, numerical solutions of ordinary differential equations, and error analysis. ***Prerequisites: MATH F302 or MATH F314 or permission of instructor. Recommended: Knowledge of programming.*** (3+0)

MATH F314 **Linear Algebra**
3 Credits
Linear equations, finite dimensional vector spaces, matrices, determinants, linear transformations and characteristic values. Inner product spaces. ***Prerequisites: MATH F201X.*** (3+0)

MATH F320 **Topics in Combinatorics**
3 Credits Offered Fall Odd-numbered Years
Introduction to some fundamental ideas of combinatorics. Topics selected from such fields as enumerative combinatorics, generating functions, set systems,

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recurrence relations, directed graphs, matchings, Hamiltonian and Eulerian graphs, trees and graph colorings. ***Prerequisites: MATH F215 or permission of instructor.*** (3+0)

MATH F321 Number Theory
3 Credits Offered Fall Even-numbered Years
The theory of numbers is concerned with the properties of the integers, one of the most basic of mathematical sets. Seemingly naive questions of number theory stimulated much of the development of modern mathematics and still provide rich opportunities for investigation. Topics studied include classical ones such as primality, congruences, quadratic reciprocity and Diophantine equations, as well as more recent applications to cryptography. Additional topics such as continued fractions, elliptical curves or an introduction to analytic methods may be included. ***Prerequisites: MATH F215 or permission of instructor.*** (3+0)

MATH F371 Probability
3 Credits Offered Fall Even-numbered Years
Probability spaces, conditional probability, random variables, continuous and discrete distributions, expectation, moments, moment generating functions, and characteristic functions. ***Prerequisites: MATH F202X.*** (3+0)

MATH F401 W Introduction to Real Analysis
3 Credits Offered Fall
Completeness of the real numbers and its consequences convergence of sequences and series, limits and continuity, differentiation, the Riemann integral. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; MATH F202X; MATH F215.*** (3+0)

MATH F402 Intermediate Real Analysis
3 Credits Offered as Demand Warrants
Intermediate topics and applications in real analysis: metric spaces, sequences and series of functions, modes of convergence. Possible other topics include: fourier series, the stone-weierstrass theorem, the arzela-ascoli theorem. ***Prerequisites: MATH F401.*** (3+0)

MATH F404 Topology
3 Credits Offered Fall Even-numbered Years
Introduction to topology, set theory, open sets, compactness, connectedness, product spaces, metric spaces and continua. ***Prerequisites: MATH F202X; MATH F215. Recommended: MATH F314 and/or MATH F405.*** (3+0)

MATH F405 W Abstract Algebra
3 Credits Offered Spring
Theory of groups, rings and fields. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; MATH F215; or permission of instructor. Recommended: MATH F307 and/or MATH F314.*** (3+0)

MATH F408 Mathematical Statistics
3 Credits Offered Spring Odd-numbered Years
Distribution of random variables and functions of random variables, interval estimation, point estimation, sufficient statistics, order statistics, and test of hypotheses including various criteria for tests. ***Prerequisites: MATH F371; STAT F200X.*** (3+0)

MATH F412 Differential Geometry
3 Credits Offered Spring Odd-numbered Years
Introduction to the differential geometry of curves, surfaces, and Riemannian manifolds. Basic concepts covered include the Frenet-Serret apparatus, surfaces, first and second fundamental forms, geodesics, Gauss curvature and the Gauss-Bonnet Theorem. Time permitting, topics such as minimal surfaces, theory of hypersurfaces and/or tensor analysis may be included. ***Prerequisites: MATH F314 and MATH F401; or permission of instructor.*** (3+0)

MATH F421 Applied Analysis
4 Credits Offered Fall
Vector calculus, including gradient, divergence, and curl in orthogonal curvilinear coordinates, ordinary and partial differential equations and boundary value problems, and Fourier series and integrals. ***Prerequisites: MATH F302.*** (4+0)

MATH F422 Introduction to Complex Analysis
3 Credits Offered Spring
Complex functions including series, integrals, residues, conformal mapping and applications. May be taken independently of MATH F421. ***Prerequisites: MATH F302.*** (3+0)

MATH F430 Topics in Mathematics
3 Credits Offered Spring
An elective course in mathematics for majors. Topics will vary from year to year and may be drawn from mathematical biology, numerical linear algebra, graph theory, logic, or other areas of mathematics. May be repeated with permission of instructor for a total of nine credits. ***Prerequisites: MATH F215 or permission of instructor.*** (3+0)

MATH F460 Mathematical Modeling
3 Credits Offered Fall Odd-numbered Years
Introduction to mathematical modeling using differential or difference equations. Emphasis is on formulating models and interpreting qualitative behavior such models predict. Examples will be taken from a variety of fields, depending on the interest of the instructor. Students develop a modeling project. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; MATH F201X; or permission of instructor. Recommended: One or more of MATH F302; MATH F310; MATH F314; MATH F401; STAT F300; some programming experience.*** (3+0)

MATH F490 O Senior Seminar
1 Credit Offered Spring
Advanced topics selected from areas outside the usual undergraduate offerings. A substantial level of mathematical maturity is assumed. ***Prerequisites: COMM F131X or COMM F141X, at least one of MATH F401 or MATH F405.*** (1+0)

MATH F600 Teaching Seminar
1 Credit
Fundamentals of teaching mathematics in a university setting. Topics may include any aspect of teaching: university regulations, class and lecture organization, testing, book selection, teaching evaluations, etc. Specific topics will vary on the basis of student and instructor interest. Individual classroom visits will also be used for class discussion. May be repeated for credit. Graded Pass/Fail. ***Prerequisites: Graduate standing.*** (1+0)

MATH F608 Partial Differential Equations
3 Credits Offered as Demand Warrants
First and second order differential equations, boundary value problems, and existence and uniqueness theorems. Green's functions, and principal equations of mathematical physics. ***Prerequisites: MATH F422 or permission of instructor.*** (3+0)

MATH F611 Mathematical Physics
3 Credits Offered Fall
Mathematical tools and theory for classical and modern physics. Core topics: Linear algebra including eigenvalues, eigenvectors and inner products in finite dimensional spaces. Infinite series. Hilbert spaces and generalized functions. Complex analysis, including Laurent series and contour methods. Applications to problems arising in physics. Selected additional topics, which may include operator and spectral theory, groups, tensor fields, hypercomplex numbers. ***Prerequisites: MATH F302; MATH F314; MATH F421; MATH F422; or permission of instructor.*** Cross-listed with PHYS F611. (3+0)

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MATH F612 Mathematical Physics
3 Credits Offered Spring
Continuation of Mathematical Physics I; mathematical tools and theory for classical and modern physics. Core topics: classical solutions to the principal linear partial differential equations of electromagnetism, classical and quantum mechanics. Boundary value problems and Sturm-Liouville theory. Green's functions and eigenfunction expansions. Integral transforms. Orthogonal polynomials and special functions. Applications to problems arising in physics. Selected additional topics, which may include integral equations and Hilbert-Schmidt theory, perturbation methods, probability theory. ***Prerequisites: PHYS/MATH F611 or equivalent; or permission of instructor.*** Cross-listed with PHYS F612. (3+0)

MATH F615 Applied Numerical Analysis
3 Credits Offered Spring Odd-numbered Years
Review of numerical differentiation and integration, and the numerical solution of ordinary differential equations. Main topics to include the numerical solution of partial differential equations, curve fitting, splines, and the approximation of functions. Supplementary topics such as the numerical method of lines, the fast Fourier transform, and finite elements may be included as time permits and interest warrants. ***Prerequisites: CS F201, MATH F310, MATH F314, MATH F421, MATH F422 or permission of instructor.*** (3+0)

MATH F617 Functional Analysis
3 Credits Offered Spring Even-numbered Years
Study of Banach and Hilbert spaces, and continuous linear maps between them. Linear functionals and the Hahn-Banach theorem. Applications of the Baire Category theorem. Compact operators, self adjoint operators, and their spectral properties. Weak topology and its applications. ***Prerequisites: MATH F314; MATH F401 or equivalent. Recommended: MATH F422; MATH F641 or equivalent.*** (3+0)

MATH F630 Advanced Linear Algebra
3 Credits Offered as Demand Warrants
Vector spaces over arbitrary fields, rational and Jordan canonical forms, invariant subspace decompositions and multilinear algebra. ***Prerequisites: MATH F405; MATH F314.*** (3+0)

MATH F631 Algebra I
4 Credits Offered Fall Even-numbered Years
Rigorous development of groups, rings and fields. ***Prerequisites: MATH F405; or permission of instructor.*** (4+0)

MATH F632 Algebra II
3 Credits Offered Fall Odd-numbered Years
Advanced topics taken from group theory, category theory, ring theory, homological algebra and field theory. ***Prerequisites: MATH F631.*** (3+0)

MATH F641 Real Analysis
4 Credits
General theory of Lebesgue measure and Lebesgue integration on the real line. Convergence properties of the integral. Introduction to the general theory of measures and integration. Differentiation, the product measures and an introduction to LP spaces. ***Prerequisites: MATH F401-F402 or permission of instructor.*** (4+0)

MATH F645 Complex Analysis
4 Credits Offered Spring Even-numbered Years
Analytic functions, power series, Cauchy integral theory, residue theorem. Basic topology of the complex plane and the structure theory of analytic functions. The Riemann mapping theorem. Infinite products. ***Prerequisites: Math F641 or permission of instructor.*** (4+0)

MATH F651 Topology
4 Credits Offered Spring Odd-numbered Years
Treatment of the fundamental topics of point-set topology. Separation axioms, product and quotient spaces, convergence via nets and filters, compactness and compactifications, paracompactness, metrization theorems, countability properties, and connectedness. Set theory as needed for examples and proof techniques. ***Prerequisites: MATH F401-F402 or MATH F404 or permission of instructor.*** (4+0)

MATH F655 Algebraic Topology
3 Credits
Fundamentals of algebraic topology with applications to topology and geometry. The fundamental group, covering spaces, axiomatic homology and singular homology. ***Prerequisites: MATH F405; MATH F401-F402; MATH F404; or permission of instructor.*** (3+0)

MATH F660 Advanced Mathematical Modeling
3 Credits Offered Spring Even-numbered Years
The mathematical formulation and analysis of problems arising in the physical, biological, or social sciences. The focus area of the course may vary, but emphasis will be given to modeling assumptions, derivation of model equations, methods of analysis, and interpretation of results for the particular applications. Examples include heat conduction problems, random walk processes, molecular evolution, perturbation theory. Students will develop a modeling project as part of the course requirements. ***Prerequisites: Permission of instructor.*** (3+0)

MATH F661 Optimization
3 Credits Offered Fall Even-numbered Years
Linear and nonlinear programming, simplex method, duality and dual simplex method, post-optimal analysis, constrained and unconstrained nonlinear programming, Kuhn-Tucker conditions. Applications to management, physical and life sciences. Computational work with the computer. ***Prerequisites: Knowledge of calculus, linear algebra, and computer programming.*** Cross-listed with CS F661. (3+0)

MATH F663 Applied Combinatorics and Graph Theory
3 Credits Offered Spring Even-numbered Years
A study of combinatorial and graphical techniques for complexity analysis including generating functions, recurrence relations, theory of counting, planar directed and undirected graphs, and applications to NP complete problems. ***Prerequisites: MATH F307 and MATH F314.*** (3+0)

MATH F665 Topics in Graduate Mathematics
3 Credits Offered as Demand Warrants
Elective courses in graduate mathematics offered by faculty on a rotating basis. Topics may include, but are not limited to, graph theory, glaciology modeling, general relativity, mathematical biology, Galois theory and numerical linear algebra. May be repeated for credit with permission of instructor. (3+0)

MECHANICAL ENGINEERING

A per semester fee for computing facilities will be assessed for one or more CEM courses. This fee is in addition to any materials fees.

ME F302 Dynamics of Machinery
4 Credits Offered Fall
Kinematics and dynamics of mechanisms. Analysis of displacements, velocities, accelerations, and forces in linkages, cams and gear systems by analytical, experimental and computer methods. Design applications. ***Prerequisites: ES F210. Co-requisite: ES F301.*** (3+3)

ME F308 Measurement and Instrumentation
3 Credits Offered Spring
Measurement theory and concepts. Includes sensors, transducers and complete measurement systems; input, output and processing of engineering parameters; telemetry, data acquisition and logging, and virtual instrument systems. Special fees apply. ***Prerequisites: ES F331.*** (2+3)

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ME F313 **Mechanical Engineering Thermodynamics**
3 Credits Offered Spring
Continuation of ES F346 including power and refrigeration cycles (Rankine, Brayton, Otto, and Diesel), compressible flow (isentropic, shock waves, and flow in ducts with friction), combustion and gas vapor mixtures. ***Prerequisites: CHEM F106X, ES F346. Co-requisite: ES F341.*** (3+0)

ME F321 **Industrial Processes**
3 Credits Offered Fall
Manufacturing processes used in modern industry. Primary and secondary manufacturing processes, casting, hot and cold forming, machining, welding and mass and efficient product design. Special fees apply. (2+3)

ME F334 **Elements of Material Science/Engineering**
3 Credits Offered Spring
Properties of engineering materials. Crystal structure, defect structure, structure and properties, aspects of metal processing, heat treatment, joining, testing and failure analysis for engineering applications and design. Special fees apply. ***Prerequisites: CHEM F106X and PHYS F212X.*** (2+3)

ME F401 **Computer Aided Design and Manufacturing**
3 Credits Offered Every Third Semester
Introduction to the principles of computer aided aided design (CAD) and computer aided manufacturing (CAM). Entry-level applications of software and hardware in solid modeling, finite element modeling, rapid prototyping, and computer numerical control. Design Project. Special fees apply. ***Prerequisites: ES F210; ES F331; ME F321.*** (1+4)

ME F402 **Advanced Mechanical System Design**
3 Credits Offered as Demand Warrants
Advanced analysis of two- and three-dimensional multi-body mechanical systems. Rigid body system formulation and deformable body system formulation. Application of CAE software for rigid body and large deformable body systems. ***Prerequisites: ME F302; ME F408; or permission of instructor.*** Stacked with ME F602. (3+0)

ME F403 **Machine Design**
3 Credits Offered Spring
Analysis and design of machine components using failure theories. Strength, life, and reliability analysis. Study of design principles and selection procedures for standard machine components. Design project. ***Prerequisites: ES F331.*** (3+0)

ME F408 **Mechanical Vibrations**
3 Credits Offered Fall
Response of mechanical systems to internal and external forces. Free and forced vibration, random vibration. Discrete and continuous systems. Vibration parameter measurements and stability criteria. ***Prerequisites: ES F201, ES F210, ES F301.*** (2+2)

ME F409 **Controls**
3 Credits Offered Fall
Analysis and design of control systems. Block diagrams, transfer functions and frequency analysis. Closed loop systems and system stability. Industrial controllers and system compensation. ***Prerequisites: ES F201; ES F301.*** (2+2)

ME F414 **Thermal Systems Design**
3 Credits Offered Fall
Introduction to the design of power and space conditioning systems, energy conversion, heating, ventilating, air conditioning, total energy systems and introduction to thermal system simulation and optimization. ***Prerequisites: ES F341; ES F346.*** (3+0)

ME F415 W **Thermal Systems Laboratory**
3 Credits Offered Spring
Testing and evaluation of components and energy systems such as pumps, fans, engines, heat exchangers, refrigerators and heating/power plants. Special fees apply. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; ES F341; ME F308; ME F313; ME F441.*** (1.5+4.5)

ME F416 **Design of Mechanical Equipment for the Petroleum Industry**
3 Credits Offered Fall
Design, selection and operation of equipment used in production and processing of crude oil and gas. Instrumentation and control systems used with mechanical equipment. ***Prerequisites: ES F341; ES F346.*** (3+0)

ME F440 **Introduction to Microfluidics**
3 Credits Offered Spring
Overview of basic concepts and principles of fluids at the micron scale; introduction to the design and fabrication of microfluidic devices. ***Prerequisites: ES F341; PHYS F103X (for Math and non-Physics science major); PHYS F211X (for Engineering, Math and Physics major); junior standing or permission of instructor.*** (3+0)

ME F441 **Heat and Mass Transfer**
3 Credits Offered Fall
Fundamental concepts of heat and mass transfer including steady state and transient conduction, laminar and turbulent free and forced convection, evaporation, condensation, ice and frost formation, black body and real surface radiation, and heat exchangers. ***Prerequisites: ES F301; ES F341; ES F346.*** (3+0)

ME F450 **Theory of Flight**
3 Credits Offered Fall Even-numbered Years
Airfoil theory in subsonic flow. Performance, stability and control of aircraft. Aircraft design. ***Prerequisites: ES F346.*** (3+0)

ME F451 **Aerodynamics**
3 Credits Offered Spring Odd-numbered Years
Aerodynamics of non-lifting and lifting airfoils in incompressible irrotational flow, wings of finite span, the Navier-Stokes equations, boundary layers, numerical methods, supersonic and transonic flow past airfoils, rocket aerodynamics, rocket drag. ***Prerequisites: ES F301, ES F341, ES F346. Co-requisite: ME F313.*** (3+0)

ME F452 **Introduction to Astrodynamics**
3 Credits Offered Fall Odd-numbered Years
Geometry of the solar system, detailed analysis of two-body dynamics and introduction to artificial satellite orbits; Hohmann transfer and patched conics for lunar and interplanetary trajectories. Elements of orbit determination. ***Prerequisites: ES F208 or ES F210; and ES F301.*** (3+0)

ME F453 **Propulsion Systems**
3 Credits Offered Spring Even-numbered Years
Basic principles of propulsion: turbojet, turboprop and rocket engines. Fluid mechanics and thermodynamics of flow in nozzles, compressors, combustors and turbines. Liquid and solid propellant rockets. Heat transfer in rocket motors and nozzles. Design and testing methods for components of propulsion systems. ***Prerequisites: ES F341; ME F313.*** (3+0)

ME F458 **Energy and the Environment**
3 Credits Offered Fall Odd-Numbered Years
Overview of basic concepts of energy supply, demand, production of heat and power impacts of energy use on the environment. Extensive discussion of mitigation technologies and strategies for meeting energy needs while preserving environmental quality. ***Prerequisites: CHEM F106X; ES F346 or equivalent; MATH F201X; PHYS F211X.*** Cross-listed with ENVE F458. Stacked with ME F658; ENVE F658. (3+0)

ME F464 **Corrosion Engineering**
3 Credits Offered Spring
Principles and forms of corrosion and factors that affect it. Methods of testing and measurement, control and prevention are examined. ***Prerequisites: ME F334.*** (3+0)

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ME F487 W,O **Design Project**
3 Credits Offered Spring
A real or simulated engineering design project selected jointly by student and instructor. Emphasis on design of practical mechanical engineering systems and/or components which integrate students' engineering knowledge and skills. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; ME F441; senior standing. Co-requisite: ME F403.*** (3+0)

ME F601 **Finite Element Analysis in Engineering**
3 Credits Offered Every Third Semester
Formulation of the finite element method. Applications to problems of engineering in solid mechanics, fluid mechanics and heat transfer. Use and development of codes for computer solution of problems. ***Prerequisites: Graduate standing in engineering; ES F201; MATH F302 or equivalent.*** (3+0)

ME F602 **Advanced Mechanical System Design**
3 Credits Offered as Demand Warrants
Advanced analysis of two- and three-dimensional multi-body mechanical systems. Rigid body system formulation and deformable body system formulation. Application of CAE software for rigid body and large deformable body systems. ***Prerequisites: ME F302; ME F408; or permission of instructor.*** Stacked with ME F402. (3+0)

ME F604 **Experimental Mechanics**
3 Credits Offered as Demand Warrants
Theory and application of the methods of experimental mechanics. Primary emphasis on photoelasticity, strain gages and brittle coating. Methods of collecting and processing data, and calculation of stresses and strains from such data. ***Prerequisites: Graduate standing in engineering.*** (2+3)

ME F608 **Advanced Dynamics**
3 Credits Offered Every Third Semester
Kinematics and kinetics of rigid bodies, introduction to analytical mechanics, Lagrange's equations and Hamiltonian mechanics. Applications to engineering problems. ***Prerequisites: ES F210; MATH F302 or equivalent; graduate standing in engineering.*** (3+0)

ME F609 **Advanced Vibrations**
3 Credits Offered Every Third Semester
Analysis of discrete and continuous vibrations via energy methods, free and forced response of linear systems, stability criteria, and introduction to random and nonlinear vibration. Applications to engineering problems. ***Prerequisites: MATH F302 or equivalent; ME F408; graduate standing in engineering.*** (3+0)

ME F617 **Power Analysis**
3 Credits Offered as Demand Warrants
Fundamentals of power generation including piping, pumps, fuels and combustion, steam generators, condensers, deaerators, evaporators, feedwater treatment and heating, regeneration, fuel handling, heat balance, equipment, economics, and plant layout. ***Prerequisites: ME F313.*** (3+0)

ME F631 **Advanced Mechanics of Materials**
3 Credits Offered Every Third Semester
Theories of elasticity and plasticity for small and large deformations. Applications to engineering problems. ***Prerequisites: ES F331 or equivalent; graduate standing in engineering.*** (3+0)

ME F634 **Advanced Materials Engineering**
3 Credits Offered Every Third Semester
Atomic bonding, crystal structure, crystal imperfections, phases and interfaces, microstructures, phase diagrams, phase transformation, transport and diffusion, metal deformation, fracture of materials, deterioration of materials, electronic and physical properties of materials. ***Prerequisites: ME F334; MATH F302 or equivalent; graduate standing in engineering.*** (3+0)

ME F640 **Introduction to Microfluidics**
3 Credits Offered Spring
Overview of basic concepts and principles of fluids at the micron scale; introduction to the design and fabrication of microfluidic devices. ***Prerequisites: ES F341; PHYS F103X (for Math and non-Physics science major); PHYS F211X (for Engineering, Math and Physics major); graduate standing or permission of instructor.*** (3+0)

ME F641 **Advanced Fluid Mechanics**
3 Credits Offered Every Third Semester
Introduction to viscous flows, laminar boundary layers, turbulent boundary layers, turbulent jets and wakes, applications to heat transfer and drag. ***Prerequisites: ES F341 or equivalent; graduate standing in engineering.*** (3+0)

ME F642 **Advanced Heat Transfer**
3 Credits Offered Every Third Semester
Heat conduction in two and three dimensions under steady and transient conditions. Free and forced convection in internal and external flows. Radiation from black and gray surfaces and gas-filled enclosures. Both analytical and numerical methods are covered. ***Prerequisites: ME F441 or equivalent; graduate standing in engineering.*** (3+0)

ME F656 **Space Systems Engineering**
3 Credits
A multidisciplinary team of students will perform a preliminary design study of a major space system. Design considerations will include requirements for project management, spacecraft design, power, attitude control, thermal control, communications, computer control and data handling. The students will present their final design in a written report and a public seminar. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with EE F656. (3+0)

ME F658 **Energy and the Environment**
3 Credits Offered Fall Odd-numbered Years
Basic concepts of energy supply, demand, production of heat and power impacts of energy use on the environment. Extensive discussion of mitigation technologies and strategies for meeting energy needs while preserving environmental quality. ***Recommended: CHEM F106X; ES F346 or equivalent; MATH F201X; PHYS F211X; graduate standing.*** Cross-listed with ENVE F658. Stacked with ME F458; ENVE F458. (3+0)

ME F685 **Arctic Heat and Mass Transfer**
3 Credits Offered as Demand Warrants
An introduction to the principles of heat and mass transfer with special emphasis on application to problems encountered in the Arctic such as ice and frost formation, permafrost, condensation and heat loss in structures. ***Prerequisites: CE F603.*** (3+0)

ME F687 **Arctic Materials Engineering**
3 Credits Offered as Demand Warrants
A study of engineering material performance at low temperatures. ***Prerequisites: CE F603 or equivalent; senior or graduate standing in science or engineering.*** (3+0)

MECHANICS-DIESEL/HEAVY EQUIPMENT

MECN F103 **Starting and Charging Systems**
3 Credits
Starting and charging systems, diagnostic methods and specifications that are standard in the industry. Volt, amperage and load tests on a battery. (1+4)

MECN F104 **Mobile Equipment Maintenance**
1 Credit
Technical, financial and legal aspects of mobile equipment maintenance. Students will work in groups to perform a maintenance operation and create maintenance records on a variety of vehicle types. (0.5+1)

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MECN F112 Basic Auto Maintenance
1 Credit
Covers basic automobile system functions, owner maintenance of electrical, cooling and fuel systems, auto lubricants and fluids, tires and wheels, tune-ups, and cold weather maintenance and operation. For the person without mechanical experience. (1+0)

MECN F159 Manual Transmissions and Clutches
2 Credits
Two major areas of automotive maintenance and repair: inspection and replacement of common clutch types; and maintenance, inspection and overhaul of automotive manual transmissions. (1+2)

MECN F201 Advanced Automobile Equipment Electronics
2 Credits
Troubleshooting and repairing a wide range of electronic systems found in both light and heavy equipment including, but not limited to, load moment limiting, motor speed control, electronic control of hydraulic systems and electronic governors for power generation. (1+2)

MECN F202 Principles of Electric Drive Vehicles
2 Credits
In-depth study of batteries: design, construction, testing and charging, currents and maintenance. Knowledge applied to DC motors, electronic controls and electronic traction motor controls. The in-shop training discusses environmental impacts of electric drive vehicles. (2+0)

MECN F203 Basic Power Generations
3 Credits
Portable and stationary electric power generators and the relationship of magnetism, AC/DC currents, motors, generators, transformers and electrical distribution. Special fees apply. ***Recommended: AUTO F110.*** (2+2)

MECN F204 Basic Alternating Current Electrician Skills
2 Credits
Basic residential and commercial electrician skills; current theory and applications; electrical measurement and circuitry. (1+2)

MECN F205 Uninterruptible Power Supplies
1 Credit
Residential and commercial power supplies; troubleshooting batteries; electronic components; reading UPS schematics. (0.5+1)

MECN F206 Emergency Backup Power Generation
1 Credit
Language and fundamentals of electricity; circuitry; conductor types and sizes; writing methods; system requirements of power generation. (0.5+1)

MECN F207 Power Generation Governors
2 Credits
Mechanically and electrically controlled engines with emphasis on what is a governor and what is its function in power generation will be covered in the hands-on diagnostic training. (1+2)

MECN F208 Alternative Fuels
2 Credits
History of fuels with emphasis on the known alternative fuels: natural gas, methanol, ethanol and propane. A research project is required. (1+2)

MECN F210 Hydraulics
3 Credits Offered Spring
Theory of fluid power and the components that make up a hydraulic system found on heavy equipment. Identification and description of hydraulic cylinders, motors, directional valves commonly found on heavy equipment. Includes testing of equipment and performing hydraulic pressure and flow tests. ***Prerequisites: DSLT F101; DSLT F103; DSLT F105.*** (1+4)

MILITARY SCIENCE

A per semester fee for clothing, equipment and other safety items required to participate in mandatory Military Science labs. Lab fees apply only to the primary Military Science classes (MILS F101, F102, F201, F202, F301, F302, F401 and F402.)

MILS F101 Foundations of Officership
2 Credits
Issues and competencies central to a commissioned officer's responsibilities. Presents a framework for understanding officership leadership and Army values. Addresses life skills including fitness and time management. Designed to encourage insight into the Army as a profession and the officer's role within the Army. Special fees apply. (1+2)

MILS F102 Basic Leadership
2 Credits
Continuation of MILS F101. Focus on communications, leadership and problem solving. Life skills lessons include: problem solving, goal setting, interpersonal communication, and assertiveness. Lessons yield immediately useful skills. Provides accurate information about life in the Army, including the organization of the Army, employment benefits and work experiences of junior officers. Special fees apply. (1+2)

MILS F201 Individual Leadership Studies (s)
3 Credits
Communication and leadership theory and application. Focus on critical life skills. Emphasis on relevance of life skills to future success in the Army. Includes a major leadership and problem solving case study which draws on virtually all of the instruction in MILS F101 and MILS F102. Special fees apply. (2+2)

MILS F202 Leadership and Teamwork
3 Credits
Focus on officership providing an extensive examination of the unique purpose, roles and obligations of commissioned officers. Includes a detailed look at the origin of our institutional values and their practical application in decision-making and leadership. Core focus is a capstone case study in officership that traces the Army's successes and failures as it evolved from the Vietnam War to present, placing previous lessons on leadership and officership in a real-world context that directly affects the future of cadets. Draws the various components of values, communications, decision-making, and leadership together to focus on a career as a commissioned officer. Special fees apply. (2+2)

MILS F250 Leaders Training Course
3 Credits
A four-week camp in basic military skills and leadership experience in preparation for entrance into the advanced course. For students who did not take the basic course. ***Prerequisites: At least two years of schooling remaining upon completion of camp. Prerequisite: Admission by arrangement with professor of military science.*** (3+0)

MILS F301 W Leadership and Problem Solving
4 Credits
Challenges cadets to study, practice and evaluate adaptive leadership skills as they are presented with the demands of preparing for the ROTC Leadership Development Assessment Course (LDAC). Challenging scenarios related to small unit tactical operations are used to develop self awareness and critical thinking skills. Cadets receive systematic and specific feedback on their leadership abilities. Cadets at the MSL III level begin to analyze and evaluate their own leadership values, attributes, skills and actions. Primary attention is given to preparation for LDAC and the development of leadership abilities. Special fees apply. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; junior standing in MILS; permission of instructor.*** (3+2)

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MILS F302 O **Leadership and Ethics**
4 Credits Offered Spring
Interdisciplinary study of effective leadership techniques and preparation for attendance in MILS F350. Laboratory sessions offer practical application of concepts taught in classroom sessions. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; junior standing in MILS; permission of instructor.*** (3+2)

MILS F350 **Leadership Development Assessment Course**
3 Credits
Five-week course structured to assess and develop the leadership capabilities of the cadet by using a variety of situations in a military environment. ***Prerequisites: MILS F301; MILS F302; must be enrolled as an advanced course cadet; and have the recommendation of the Department Head.*** (3+0)

MILS F351 **Cadet Troop Leadership Training**
2 Credits
Three- to five-week full-time leadership training and development, serving in leadership positions with the active Army. Application of leadership and management principles in real life junior officer situations/positions. ***Prerequisites: MILS F101; MILS F350; must be enrolled as an advanced course cadet.*** (0+0)

MILS F401 **Developmental Leadership** (s)
4 Credits
Develops student proficiency in planning, executing and assessing complex operations, functioning as a member of a staff and providing leadership-performance feedback to subordinates. Students are given situational opportunities to assess risk, make ethical decisions and provide coaching to fellow ROTC students. MSL IV cadets are measured by their ability both to give and receive systematic and specific feedback on leadership abilities. Cadets at the MSL IV level analyze and evaluate the leadership values, attributes, skills and actions of MSL III cadets while simultaneously considering their own leadership skills. Attention is given to preparation for BOLC II and the development of leadership abilities. Special fees apply. ***Prerequisites: Senior standing in MILS and permission of instructor.*** (3+2)

MILS F402 **Officership**
4 Credits
Continuation of MILS F401. Includes study of military ethics and law. Student role in laboratory sessions is to plan instruction and assess performance of MILS F100-F300-level students. Special fees apply. ***Prerequisites: Senior standing in MILS and permission of instructor.*** (4+0)

MILS F442 **History of the American Military** (s)
3 Credits
The military's place in American life and society from the Colonial era to the present. Role of the military institution in shaping the nature of American society while reflecting the character of the society it serves. Also available through the Center for Distance Education. ***Prerequisites: Sophomore standing or permission of instructor.*** Cross-listed with HIST F442. (3+0)

MINERAL PREPARATION ENGINEERING

A per semester student computing facility user fee is assessed for CEM engineering courses. This fee is in addition to any lab/material fees.

MPR F601 **Froth Flotation**
3 Credits Offered Fall
Theory and application of bulk and differential froth flotation to metallic minerals, nonmetallic minerals and coal. ***Prerequisites: Admission by arrangement.*** (2+3)

MPR F606 **Plant Design**
3 Credits Offered Fall Odd-numbered Years
Selection and design of equipment for the operation of mineral and coal beneficiation plants for specific custom and milling problems. ***Prerequisites: Admission by arrangement.*** (1+6)

MPR F611 **Hydrometallurgy**
3 Credits
Study of the theoretical and engineering aspects of the processes to recover metals from different types of ores and/or scraps, in which aqueous solutions play the predominate role. ***Prerequisites: MATH F202X; CHEM F331; or permission of instructor.*** (3+0)

MPR F612 **Solution Concentration and Purification**
3 Credits
The physical chemistry of reaction encountered in solution concentration and purification processes. The types of reaction discussed are cementation, solvent extraction, ion exchange and carbon absorption which are studied in terms of solution chemistry, reaction kinetics and mass transfer effects. ***Prerequisites: MATH F202X; CHEM F331; or permission of instructor.*** (3+0)

MPR F613 **Waste Problems and Treatments**
3 Credits
Waste problems and treatments encountered in mineral processing and metallurgical industries. Includes waste problems and treatments in gold, copper, zinc, iron and steelmaking, aluminum and non-metal industries as well as in electronic and electroplating industries. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

MPR F684 **Mineral Preparation Research**
3 Credits
Basic research and its needs in the field of mineral beneficiation, including magnetic susceptibility, dielectric constants and electrical conductivity of minerals; chemical theory and mechanism of bubble contact in flotation; and the effect of ultrasonic vibration in unit processes. ***Prerequisite: Admission by arrangement.*** (1+6)

MPR F688 **Graduate Seminar I**
1 Credit
Preparation and presentation of research outlines by graduate students and participation in regularly organized mineral engineering department seminars. ***Prerequisites: Admission to graduate program.*** Cross-listed with MIN F688. (1+0)

MINING APPLICATIONS AND TECHNOLOGIES

AMIT F101 **Introduction to Mining**
3 Credits Offered as Demand Warrants
Fundamentals of surface and underground mining, economic planning, proper exploration designs, environmental concerns and safety factors. Special fees apply. (3+0)

AMIT F109 **Underground Mine Safety**
1 Credit Offered as Demand Warrants
Rights of miners, self rescue devices, introduction to the work environment, escapeways, roof and ground control, ventilation, health, cleanup, hazard recognition, first aid, mine gasses and electrical hazards. Course fulfills the Mine Safety Health Administration requirements for new underground miner training. Students are awarded MSHA certificate upon course completion. Special fees apply. (1+0)

AMIT F110 **Underground Mining I**
3 Credits Offered as Demand Warrants
Orientation to the mine environment, general mine inspection, scaling, staging, drilling, rock bolting, blasting, mucking and mine rescue. Provides the

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inexperienced underground miner with the mandatory MSHA federal training to become employable. Special fees apply. (3+0)

AMIT F120 **Explosives I**
3 Credits Offered as Demand Warrants
Theory and safe use of explosives with a focus on blasting agents used for rock excavation. Special fees apply. (3+0)

AMIT F125 **Mineral Exploration Techniques**
3 Credits Offered as Demand Warrants
Modern, scientific exploration and prospecting techniques utilized in Alaska since the 1970s. Exploration design, ore deposit models, exploration geochemistry and geophysics, drilling sampling and geostatistics. Also available through the Center for Distance Education. Special fees apply. (3+0)

AMIT F129 **Surface Mine Safety**
1 Credit Offered as Demand Warrants
Rights of miners, introduction to the work environment, ground control, hazard recognition, first aid and explosive safety. Course fulfills the Mine Safety Health Administration requirements for surface miner training. Students are awarded MSHA certificate upon completion of the class. Special fees apply. (1+0)

AMIT F130 **Surface Mining Operations**
3 Credits Offered as Demand Warrants
Safe operations of a surface mine. Placer gold, sand and gravel, coal, and open pit metal mines. Special fees apply. (3+0)

AMIT F135 **Introduction to Mining Systems and Equipment**
4 Credits Offered as Demand Warrants
An overview to the field of mining beneficiation and comminution, systems and equipment used for the mining and mineral processing industry. Fundamentals of basic separation and mineral beneficiation of surface and underground mining, economic planning, environmental concerns, safety and terminology will be explored. Special fees apply. (3+3)

AMIT F140 **Environmental Permitting**
1 Credit Offered as Demand Warrants
Mineral development permits required in Alaska. Students are encouraged to provide their own case histories. Special fees apply. (1+0)

AMIT F145 **Introduction to Mineral Beneficiation**
3 Credits Offered as Demand Warrants
Provides an overview or introduction into the field of mineral beneficiation and comminution, systems and equipment used for the mineral processing industry. Fundamentals of basic separation and mineral beneficiation, environmental concerns, safety and terminology will be explored. Special fees apply. (3+0)

AMIT F152 **Fire Assay Techniques**
1 Credit Offered as Demand Warrants
Sampling, theory and practice of fire assaying. Fluxes, oxidation and reduction reactions, fusion of assay charges, cupellation, annealing, micro-weighing and assay charge calculation. Special fees apply. (1+0)

AMIT F153 **Laboratory Analysis**
1 Credit Offered as Demand Warrants
Production laboratory procedures for sample analysis, heap leaching and titrations. Individual projects required. Special fees apply. (1+0)

AMIT F154 **Water Quality and Flocculants**
3 Credits Offered as Demand Warrants
Water quality processes using flocculants and removal of total suspended solids from placer mining waste water. Design of settling ponds and recycle system. Students will work with individual case histories. Special fees apply. (3+0)

AMIT F161 **Alaska Ore Deposits**
1 Credit Offered as Demand Warrants
Geology, ore reserves and preliminary mining plans of significant Alaska mineral deposits. Special fees apply. (1+0)

AMIT F162 **Geochemical Sampling**
1 Credit Offered as Demand Warrants
Hands-on scientific sampling methods for rock, soil, pan concentrates, stream sediments, air and water. Special fees apply. (1+0)

AMIT F170 **Fundamentals of Coal Mining**
3 Credits Offered as Demand Warrants
Origin and types of Alaska and other coal deposits, exploration and planning methods, extraction processes for underground and surface mines, mining safety, coal preparation and reclamation. Job requirements, safety and environmental consideration. Optional field trip to an active coal mine. Special fees apply. (3+0)

AMIT F205 **Geomagnetic Surveying**
1 Credit Offered as Demand Warrants
Placer gold deposit prospecting using magnetic surveying. Student survey work and data interpretation. Special fees apply. (1+0)

AMIT F210 **Underground Mining II**
3 Credits Offered as Demand Warrants
Skill training conducted in safety, drilling, blasting, ground support, mucking, maintenance and utilities. Special fees apply. (3+0)

AMIT F220 **Explosives II**
3 Credits Offered as Demand Warrants
Advanced techniques in safe use of explosives. Students get hands-on experience in blasting. Special fees apply. (3+0)

AMIT F230 **Field Methods**
2 Credits Offered as Demand Warrants
Topographic map reading using a compass and basic field procedures. Map and chart preparation. Drafting skills for prospecting maps, mine maps, permits and data presentation. Special fees apply. (2+0)

AMIT F231 **Heap Leaching**
1 Credit Offered as Demand Warrants
Heap leaching covering cyanide safety, leach pad construction and placement, cyanide processing, thiourea, case histories, applications to Alaska and economics. Special fees apply. (1+0)

AMIT F282 **Mining Coop Work Experience**
1-2 Credits Offered as Demand Warrants
Practical work experience in a professional mining environment. For the student who has mastered basic mining techniques and terminology. Placement and work assignments depend upon student experience. Special fees apply. (0+0)

MINING ENGINEERING

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MIN F101 **Minerals, Man and the Environment**
3 Credits
A general survey of the impact of the mineral industries on man's economic, political and environmental systems. (3+0)

MIN F103 **Introduction to Mining Engineering**
1 Credit
Concepts and methods utilized in mining engineering and mining unit operations. (1+0)

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MIN F104 Mining Safety and Operations Laboratory
1 Credit
Practical training at the Silver Fox Mine in mining operations and safety. Course complies with Mine Safety and Health Administration (MSHA) 40 hour new miner training. Special fees apply. (0+3)

MIN F202 Mine Surveying
3 Credits Offered Fall
Surveying principles for surface and underground control of mining properties. Field and office procedures for preparation of maps and engineering data. Special fees apply. ***Prerequisites: MATH F107X, MATH F108 or equivalents.*** (2+3)

MIN F225 Quantitative Methods in Mining Engineering
2 Credits Offered Fall
Introduction to ore reserve estimation, classical estimation methods and techniques, error in estimations and pitfalls, introduction to classical statistics, introduction to geostatistics, ordinary kriging, block kriging, modeling the sample variogram, co-kriging and global estimation. ***Prerequisites: MIN F103; MATH 107X and MATH 108X; MATH F200X or equivalent; or permission of instructor.*** (2+0)

MIN F301 Mine Plant Design
3 Credits
Quantitative study and design of various systems and equipment used in haulage, hoisting, drainage, pumping and power (compressed air and electricity). Importance of the natural conditions and production level in the equipment selection procedure emphasized. ***Prerequisites: ES F208 and ES F307. Recommended: ES F341.*** (3+0)

MIN F226 Mine Development
2 credits Offered Spring
Review of pre-mining activities. Access to mining property via haul road location and design; access to ore body via shaft, slope and ramp locations, shape, sizing and development. Development of access in frozen ground. Layout of development mains, cross-cuts, raises and winzes for ventilation, transport and optimum extraction of ore body. Level intervals, size and location of ore passes, design and optimization. ***Prerequisite: MIN 103.*** (2 + 0)

MIN F302 Underground Mine Environmental Engineering
3 Credits
Analysis of underground mine ventilation systems, ventilation planning, design and engineering control, mine ventilation network. ***Prerequisites: MIN F103.*** (2+3)

MIN F304 Introduction to Metallurgy
3 Credits
Overview of the extractive metallurgy of gold, silver and platinum group metals; from gravity concentration to cyanidation and smelting. ***Prerequisites: PHYS F212X.*** (3+0)

MIN F313 Introduction to Mineral Preparation
3 Credits
Elementary theory and principles of unit processes of liberation, concentration and solid-fluid separation as applied to mineral beneficiations. ***Prerequisites: Junior standing or permission of instructor.*** (2+3)

MIN F370 Rock Mechanics
3 Credits
Physical and mechanical properties of rock; rock mass classification systems; stress distribution in the vicinity of mining openings, design criteria and support for structures in rock mass, instrumentation and monitoring of opening's stability as well as strata control and surface subsidence. ***Prerequisites: ES F331 or permission of instructor.*** (2+3)

MIN F380 Computer Aided Orebody Modeling
1 Credit Offered Fall
Develops a orebody model from drillhole data in a computer aided design environment. The data is converted into a drillhole database, following which, a 3D visual model is developed. Basic tools covered include concepts of computer aided design, database error checking and triangulation. ***Prerequisites: GEOS F332; or permission of instructor.*** (2+3)

MIN F401 Mine Site Field Trips
1 Credit
Field trips to active surface and underground mines to gain perceptual knowledge of modern mining systems by observation. Includes a systematic summarization and analysis of the mine after each visit to gain an in-depth understanding of mining engineering principles. Graded Pass/Fail. ***Prerequisites: MIN F202; MIN F301; MIN F302; MIN F370.*** (0.5+3)

MIN F407 W Mine Reclamation and Environmental Management
3 Credits
Principles and practices of mine reclamation and waste disposal. Pre-mining assessments and plans. Design of settling and tailings ponds and waste impoundments. Stream bed restoration and revegetation. ***Prerequisites: CHEM F106X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor. Recommended: ES F341.*** (3+0)

MIN F408 O Mineral Valuation and Economics
3 Credits
Introduction to engineering economics, ore sampling and reserve calculations, and mine feasibility studies. ***Prerequisites: COMM F131X or COMM F141X; GE F375 or MIN F301.*** (3+0)

MIN F409 Operations Research and Computer Applications in Mineral Industry
3 Credits
Fundamental concepts of probability and statistics and the use of operations research and computer techniques for understanding, analysis, forecasting and optimization of mining operations and systems. ***Prerequisites: Junior standing.*** (3+0)

MIN F415 Coal Preparation
3 Credits
Unit operations, flowsheets, washability characteristics and control by sink-float methods for coal preparation plants. Market requirements and economics of preparation. ***Prerequisites: MIN F313 or graduate standing.*** (2+3)

MIN F443 Principles and Applications of Industrial Explosives
3 Credits
Types and properties of industrial explosives; systems of initiation; theories of blasting; designs of open pit bench blasting; designs of underground blasting/rounds; applications in mining, civil construction and other fields; blasting vibration, structural damage and their control; overbreak control; safe practices; safety regulations; blast hole drilling and drilling equipment. ***Prerequisites: MIN F370 or permission of instructor.*** (3+0)

MIN F447 Placer Mining
3 Credits
Placer formation and identification, reserve estimation, mine and wash plant design. Includes surface and underground mining methods, equipment specification, environmental compliance and reclamation. ***Prerequisites: MIN F301; MIN F313.*** (3+0)

MIN F454 Underground Mining Methods
3 Credits
Underground mining methods for coal and non-coal deposits. Includes design parameters, selection of mining methods, mine planning process, auxiliary operations and various underground mining methods. ***Prerequisites: MIN F301; MIN F302; MIN F370.*** (3+0)

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MIN F481 **Computer-Aided Mine Design — TECHBASE**
3 Credits Offered Spring Odd-numbered Years
Familiarization with TECHBASE to store, manage, model and display exploration data. Includes creating a database; loading, editing and reporting data; calculating summary statistics; and constructing base and contour maps. Use of TECHBASE tools for two- and three- dimensional estimation methods, mine design and scheduling, production grade-tonnage curve using a range of cutoff grades and generation of outlines for pit design. ***Prerequisites: Junior, senior or graduate standing in Mining Engineering, Geological Engineering, or permission of instructor.*** (2+3)

MIN F482 **Computer-Aided Mine Design — VULCAN**
3 Credits Offered Fall
Familiarization with VULCAN mine design software to store, manage, model and display exploration data. Estimate volume, tonnage and quality of reserve, design declines and development drives in underground and surface coal and hardrock mines, design underground and surface coal mine plans and design of underground stopes, perform underground and surface grade control. ***Prerequisites: Junior, senior or graduate standing in Mining Engineering, Geological Engineering, or permission of instructor.*** Stacked with MIN F682. (2+3)

MIN F484 **Surface Mining Methods**
2 Credits
Modern methods of surface mine design. Strip and open pit optimization techniques. Production planning and scheduling. Use of mine design software. ***Prerequisites: Senior standing, concurrent enrollment in MIN F409 or permission of instructor.*** (2+0)

MIN F485 **Mining Engineering Exit Exam**
0 Credits
Exam is designed to evaluate overall performance as mining engineering graduates. Covers various topics that students have learned in the field of mining engineering and related fields. Graded Pass/Fail. ***Prerequisites: Senior standing in mining engineering.*** (0+0)

MIN F489 **Mining Design Project I**
1 Credit Offered Fall
This course is a pre-cursor to MIN F490. The student is expected to meet with the instructor to finalize the senior design project topic, lay out a project plan, gather data and prepare as necessary for the successful execution of the project in MIN F490. Note: Both MIN F489 and MIN F490 must be completed to fulfill the writing intensive requirement. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; MIN F301; MIN F302; MIN F370.*** (1+0)

MIN F490 W **Mining Design Project II**
2 Credits Offered Spring
Design of mine layout including extraction and beneficiation, and economic evaluation of a mining project. A comprehensive written report of the design and analysis is required. Note: Both MIN F489 and MIN F490 must be completed to fulfill the writing intensive requirement. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; MIN F301; MIN F302; MIN F370; MIN F454; MIN F489.*** (1+4)

MIN F601 **Application of Artificial Neural Networks**
3 Credits
Basic neural network architectures, including rules, training methods and practical applications. Training and application issues typical of earth sciences problems. Some topics require mathematical analysis. Genetic algorithms and use of network ensembles will be briefly presented. ***Prerequisites: Graduate standing in engineering; programming ability; knowledge of MATLAB, a plus. Recommended: MATH F202X, MATH F314; MIN F408; MIN F635.*** (3+0)

MIN F621 **Advanced Mineral Economics**
3 Credits
Economics of mineral exploitation and use. International trade, state and federal policies; financial control, and research methods. ***Prerequisites: Admission by arrangement.*** (3+0)

MIN F631 **Research Methods in Mineral Engineering**
4 Credits
Research methods including problem definition and statement, designing experiments, collecting and interpreting data. Methods of theoretical and experimental analysis will be reviewed and examples given. ***Prerequisites: Graduate standing or permission of instructor.*** (3+3)

MIN F635 **Geostatistical Ore Reserve Estimation**
3 Credits Offered Spring
Introduction to the theory and application of geostatistics. Review of classical statistics, continuous and discrete distributions, hypothesis testing and global estimation. Presentation of fundamental geostatistical concepts including: variogram, estimation variance, block variance, kriging, geostatistical simulation. Emphasis on the practical application of geostatistical techniques. ***Prerequisites: MIN F408 or equivalent; graduate standing; or permission of instructor.*** Cross-listed with GE F635. (2+3)

MIN F637 **Mine Systems Simulation**
3 Credits
Application of computer simulation to the analysis of static and dynamic mine systems and the development of useful programs for mine operators. Design of simulation experiments in mining engineering. ***Prerequisites: MIN F409 or equivalent; graduate standing.*** (2+3)

MIN F646 **Mining Engineering in the Arctic**
3 Credits
Mining engineering problems encountered in arctic conditions. Design and construction of mine openings in frozen ground, mechanical and thermal properties of rocks at subfreezing temperatures, fragmentation and excavation of frozen ground, surface mining problems in the arctic climate, equipment maintenance, mined-land reclamation and economic evaluation of mineral properties in arctic regions. Case studies also are presented. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

MIN F652 **Numerical Methods in Mine Ventilation**
3 Credits
Differencing schemes for the partial differential equations of flow in mine networks, typical boundary conditions for mine ventilation systems, computer-aided solution techniques. Application to flow of fluids through porous media is covered. ***Prerequisites: MIN F302 or equivalent; graduate standing.*** (2+3)

MIN F670 **Optimization Models in the Mineral Industry**
3 Credits
Study of concepts and methods in analysis of systems involving single and multiple objectives, with applications to mining engineering and mine environmental systems. ***Prerequisites: MIN F409 or equivalent, permission of instructor.*** (3+0)

MIN F673 **Advanced Rock Mechanics**
3 Credits
The study of theoretical and experimental methods in rock mechanics. State of stress and potential failure zone around two- and three-dimensional structures in rock based on theoretical, numerical and experimental techniques and failure criteria are presented. ***Prerequisites: MIN F370 or equivalent or graduate standing.*** (2+3)

MIN F682 **Computer-Aided Mine Design — VULCAN**
3 Credits Offered Fall
Familiarization with VULCAN mine design software to store, manage, model and display exploration data. Estimate volume, tonnage and quality of reserve, design declines and development drives in underground coal and hardrock mines, design underground coal mine plans and design of underground

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stopes, perform underground grade control. ***Prerequisites: Graduate standing in Mining Engineering or Geological Engineering; or permission of instructor.*** Stacked with MIN F482. (2+3)

MIN F688 Graduate Seminar I
1 Credit
Preparation and presentation of research outlines by graduate students and participation in regularly organized mineral engineering department seminars. ***Prerequisites: Admission to graduate program.*** Cross-listed with MPR F688. (1+0)

MIN F689 Graduate Seminar II
1 Credit
Presentation of graduate research by graduate students and participation in regularly organized mineral engineering department seminars. ***Prerequisites: Admission to graduate program.*** (1+0)

MUSIC

MUS F101 University Chorus (h)
1 Credit
A chorus serving both beginning and skilled singers presenting concerts each semester of popular and classic choral literature. (0+3)

MUS F103 Music Fundamentals (h)
3 Credits
An introductory study of the language of music. Includes basic notation, melodic and rhythmic writing, scales, bass and treble clefs, and basic harmony. Also available through the Center for Distance Education. (3+0)

MUS F105 UAF Steel Drum Ensemble (h)
1 Credit
Performance class designed to prepare performances of soca, calypso, and reggae music from the Caribbean Islands, as well as Latin style music. Ensemble includes percussion and a few other supporting instruments. May be repeated for credit. ***Prerequisites: Ability to sight-read music; permission of instructor. Recommended: MUS F103.*** (0+3)

MUS F117 Northern Lights String Orchestra (h)
1 Credit
Explore literature written primarily for string orchestra. Periodically, winds and percussion will join for performances of literature requiring additional instruments. Works studied vary from semester to semester depending on the instrumentation of those enrolled in the course. May be repeated for credit. ***Prerequisites: Previous instruction on a bowed string instrument; permission of instructor.*** (0+3)

MUS F122 History of Popular Music (h)
3 Credits
The development of American popular music from ragtime to rock to rap: its styles, artists, cultural origins, social symbolism and influence worldwide. How popular music in each decade reflects the social ethos of the times, expresses youth attitudes and mirrors lifestyle. An examination of music's function in society. (3+0)

MUS F124 Music in World Cultures (h)
3 Credits
A survey of traditional and folk music around the world, with an emphasis on Oriental and African music. Examines different uses of music in various societies, and includes demonstration of ethnic musical instruments. (3+0)

MUS F125 Enjoying Jazz (h)
2 Credits
An overview of the jazz idiom. Learning about the performers, styles and the music by using records, CD's, cassettes and video tapes. A listening intensive course that should provide students with a better understanding of this art form and the significant styles and artists in it. Also available through the Center for Distance Education. (2+0)

MUS F131 Basic Music Theory (h)
2 Credits
Intensive training in fundamentals of music, pitch and rhythm notation, scales, modes, triads and techniques of harmonization. ***Prerequisites: Concurrent enrollment in MUS F133.*** (2+0)

MUS F132 Basic Music Theory (h)
2 Credits
Concentration upon acquisition of skills in harmonization and techniques of formal and harmonic analysis. ***Prerequisites: MUS F131 or equivalent and concurrent enrollment in MUS F134 unless exempted by music theory placement test.*** (2+0)

MUS F133 Basic Ear Training (h)
2 Credits
Ear training skills including sight reading, sight singing, error detection and dictation. Use of programmed materials in a laboratory situation in addition to classroom instruction. ***Prerequisites: Concurrent enrollment in MUS F131.*** (2+0)

MUS F134 Basic Ear Training (h)
2 Credits
Ear training skills including sight reading, sight singing, error detection and dictation. Use of programmed materials in a laboratory situation in addition to classroom instruction. ***Prerequisites: MUS F133 or equivalent and concurrent enrollment in MUS F132 unless exempted by music theory placement test.*** (2+0)

MUS F151 Class Lesson (h)
1 Credit
Class instruction in piano, voice, orchestral instrument or guitar. May be repeated for credit. Course may not be audited. Special fees apply. (0+3)

MUS F153 Functional Piano (h)
1 Credit
Laboratory instruction to help music majors obtain performance, sight-reading and harmonization-transposition skills needed to pass the piano proficiency examination. It also provides non-music majors an opportunity to study basic piano skills on a space-available basis. Course may not be audited. Special fees apply. ***Prerequisites: For music majors, MUS F131 or equivalent or concurrent enrollment in MUS F131. For non-music majors, permission of instructor.*** (1+0)

MUS F161 Private Lessons (h)
2 Credits
Private instruction in piano, organ, voice, guitar, orchestral and band instruments. Private instruction shall consist of one private lesson per week. Music performance majors must enroll for 4 credits for MUS F361-F462 levels of study. All other students will normally enroll for 2 credits, except where special permission is granted. Special fees apply. ***Prerequisites: Admission by audition. Special permission required. Note: Course may not be audited. Credit-No Credit grading not permitted. Concurrent enrollment in MUS F190: Recital Attendance required.*** (2+0)

MUS F162 Private Lessons (h)
2 Credits
Private instruction in piano, organ, voice, guitar, orchestral and band instruments. Private instruction shall consist of one private lesson per week. Music performance majors must enroll for 4 credits for MUS F361-F462 levels of study. All other students will normally enroll for 2 credits, except where special permission is granted. Special fees apply. ***Prerequisites: Admission by audition. Special permission required. Note: Course may not be audited. Credit-No Credit grading not permitted. Concurrent enrollment in MUS F190: Recital Attendance required.*** (2+0)

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MUS F190 Recital Attendance
0 Credits
Recital and concert attendance. Graded Pass/Fail. (1+0)

MUS F200X Aesthetic Appreciation: Interrelation of Art, Drama, and Music (h)
3 Credits
Understanding and appreciation of art, drama, and music through an exploration of their relationship. Topics include the creative process, structure, cultural application and diversity, the role of the artist in society, and popular movements and trends. Also available through the Center for Distance Education. ***Prerequisites: Placement in ENGL F111X or higher; sophomore standing; or permission of instructor.*** Cross-listed with ART F200X; THR F200X. (3+0)

MUS F203 Fairbanks Symphony Orchestra (h)
1 Credit
Prerequisites: Admission by audition. (0+3)

MUS F205 Wind Ensemble (h)
1 Credit
Prerequisites: Admission by audition. (0+3)

MUS F207 UAF Jazz Band (h)
1 Credit
A performance ensemble that performs a feature concert each semester and tours frequently within the state and occasionally outside the state. ***Prerequisites: Audition and permission of instructor. Course may not be audited.*** (0+3)

MUS F211 Choir of the North (h)
1 Credit
A mixed choir serving more advanced singers presenting concerts of more advanced choral music literature. ***Prerequisites: Admission by audition.*** (0+3)

MUS F221 History of Music (h)
3 Credits
Music before 1750. ***Prerequisites: MUS F131; MUS F132; or permission of instructor.*** (3+0)

MUS F222 History of Music (h)
3 Credits
Music since 1750. ***Prerequisites: MUS F131; MUS F132; or permission of instructor.*** (3+0)

MUS F223 Alaska Native Music (h)
3 Credits
Eskimo and Indian dance and song styles in Alaska. Emphasis on the sound, effect and purpose unique to each and the collection methods, analysis and the development of a broad musical perspective. Cross-listed with ANS F223. (3+0)

MUS F231 Advanced Music Theory (h)
2 Credits Offered Fall
Continued study of harmony and musical form through analysis of representative works from the standard repertoire. ***Prerequisites: Concurrent enrollment in MUS F233.*** (1+2)

MUS F232 Advanced Music Theory (h)
2 Credits Offered Spring
Study and synthesis of 20th century stylistic and harmonic idioms. ***Prerequisites: MUS F231 or equivalent; concurrent enrollment in MUS F234 unless exempted by music theory placement test.*** (1+2)

MUS F233 Advanced Ear Training
1 Credit
Continued training in sight singing and melodic dictation skills begun in MUS F133 and MUS F134. Harmonic dictation and error detection skills also included. ***Prerequisites: MUS F134 or equivalent; concurrent enrollment in MUS F231.*** (0+2)

MUS F234 Advanced Ear Training
1 Credit
Continued training in sight singing and melodic dictation skills begun in MUS F133 and MUS F134. Harmonic dictation and error detection skills also included. ***Prerequisites: MUS F233 and concurrent enrollment in MUS F232 unless exempted by music theory placement test.*** (0+2)

MUS F245 Singer's Diction I: English and Italian (h)
2 Credits
A systematic approach for singers through use of the International Phonetic Alphabet for the transcription and pronunciation of song texts in English and Italian. A singer's diction course would be valuable to radio announcers or anyone needing rules of pronunciation for names, titles, phrases, etc. in foreign languages. ***Recommended: One year of private voice lessons.*** (2+0)

MUS F246 Singer's Diction II: French and German (h)
2 Credits
A systematic approach for singers through use of the International Phonetic Alphabet for the transcription and pronunciation of song texts in French and German. A singer's diction course would be valuable to radio announcers or anyone needing rules of pronunciation for names, titles, phrases, etc. in foreign languages. ***Recommended: One year of private voice lessons.*** (2+0)

MUS F253 Piano Proficiency
0 Credits
Final phase of piano proficiency examination. Graded Pass/Fail. ***Prerequisites: MUS F153; music major; permission of instructor.*** (0+1)

MUS F261 Private Lessons (h)
2 Credits
Private instruction in piano, organ, voice, guitar, orchestral and band instruments. Private instruction shall consist of one private lesson per week. Music performance majors must enroll for 4 credits for MUS F361-F462 levels of study. All other students will normally enroll for 2 credits, except where special permission is granted. Special fees apply. ***Prerequisites: Admission by audition. Special permission required. Note: Course may not be audited. Credit-No Credit grading not permitted. Concurrent enrollment in MUS F190: Recital Attendance required.*** (2+0)

MUS F262 Private Lessons (h)
2 Credits
Private instruction in piano, organ, voice, guitar, orchestral and band instruments. Private instruction shall consist of one private lesson per week. Music performance majors must enroll for 4 credits for MUS F361- F462 levels of study. All other students will normally enroll for 2 credits, except where special permission is granted. Special fees apply. ***Prerequisites: Admission by audition. Special permission required. Note: Course may not be audited. Credit-No Credit grading not permitted. Concurrent enrollment in MUS F190: Recital Attendance required.*** (2+0)

MUS F307 Chamber Music (h)
1 Credit
String, brass or woodwind chamber music; piano chamber music and accompanying; stage band; and Alaska Camerata. Note: Course may not be audited. ***Prerequisites: Permission of instructor.*** (0+3)

MUS F313 Opera Workshop (h)
1-3 Credits
(0+3-9)

MUS F317 Arctic Chamber Orchestra (h)
1 Credit
The touring group of the Fairbanks Symphony Orchestra. Must be a member of the Fairbanks Symphony Orchestra. (MUS F203-EV1). ***Prerequisites: By audition only.*** (0+3)

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MUS F319 **Alaska Chamber Chorale** (h)
1 Credit
An auditioned vocal ensemble of no more than 32 singers, male and female. The music learned and performed will be primarily, but not limited to, a cappella pieces with an emphasis on pre-classical and 20th century music. The group will perform alone and with other UAF music groups. ***Prerequisites: Audition and permission of instructor.*** (0+3)

MUS F331 **Form and Analysis** (h)
3 Credits
Formal and stylistic musical elements in historical context with special application to problems of proper stylistic performance. ***Prerequisites: MUS F232 or permission of instructor.*** (3+0)

MUS F332 **Introduction to Computer-based Music Technology** (h)
3 Credits
An introduction to personal computer-based software and music synthesis hardware to enable the student to print music scores and/or develop MIDI format sequencer files. May be repeated for credit. ***Prerequisites: MUS F232 or equivalent or permission of instructor. Recommended: MUS F432.*** (3+0)

MUS F351 O **Conducting** (h)
3 Credits
Principles of conducting; interpretation of vocal and instrumental ensemble music. ***Prerequisites: COMM F131X or COMM F141X; MUS F232.*** (3+0)

MUS F361 **Private Lessons** (h)
2 or 4 Credits
Private instruction in piano, organ, voice, guitar, orchestral and band instruments. Private instruction shall consist of one private lesson per week. Music performance majors must enroll for 4 credits for MUS F361-F462 levels of study. All other students will normally enroll for 2 credits, except where special permission is granted. Special fees apply. ***Prerequisites: Admission by audition. Special permission required. Note: Course may not be audited. Credit-No Credit grading not permitted. Concurrent enrollment in MUS F190: Recital Attendance required.*** (2 or 4+0)

MUS F362 **Private Lessons** (h)
2 or 4 Credits
Private instruction in piano, organ, voice, guitar, orchestral and band instruments. Private instruction shall consist of one private lesson per week. Music performance majors must enroll for 4 credits for MUS F361- F462 levels of study. All other students will normally enroll for 2 credits, except where special permission is granted. Special fees apply. ***Prerequisites: Admission by audition. Special permission required. Note: Course may not be audited. Credit-No Credit grading not permitted. Concurrent enrollment in MUS F190: Recital Attendance required.*** (2 or 4+0)

MUS F390 **Junior Recital**
0 Credits
Half-length solo music performance recital. Graded Pass/Fail. ***Prerequisites: MUS F262 or equivalent; music major; junior standing in music study; permission of instructor.*** (0+0)

MUS F410 W **Women in Music History** (h)
3 Credits
Lives and works of female musicians, composers and performers will be traced from the earliest days of the ancient and mythological periods through the medieval, Baroque, Classical and Romantic periods with special emphasis on composers of the 20th century. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; junior standing; or permission of instructor.*** Cross-listed with WMS F410. (3+0)

MUS F421 W **Music before 1620** (h)
3 Credits
Music from its origins in Greek antiquity through the Middle Ages and the Renaissance up to and including the emergence of opera at the turn of the 17th century. Includes study of prominent composers, early musical forms, original sources in translation, development of musical notation and development of early musical instruments. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; MUS F221; MUS F222; or permission of instructor.*** (3+0)

MUS F422 W **Music in the 17th and 18th Centuries** (h)
3 Credits
Style and performance practices of opera, oratorio, cantata, sonata and concerto, as well as chamber music. Development of keyboard instruments as well as other instrumental genres: strings, winds and brasses. Style study of representative works from early Baroque composers through Bach, Handel, Bach's sons, Haydn, Mozart, Beethoven and others. Musical developments in Italy, England, France, Germany, Austria and cross-cultural influences. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; MUS F221; MUS F222; or permission of instructor.*** (3+0)

MUS F423 W **Music of the 19th Century** (h)
3 Credits
Musical trends in the 19th century. Romanticism, nationalism, Italian opera and Wagnerian music drama, as exemplified by representative works, chosen from the music of Weber, Berlioz, Mendelssohn, Schumann, Brahms, Wagner, Chopin, Tchaikovsky and others. Related readings in other aspects of the Romantic movement. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; MUS F221 or MUS F222; or permission of instructor.*** (3+0)

MUS F424 W **Music since 1900** (h)
3 Credits
Study of significant works from the modern repertoire, beginning with the later works of Strauss and continuing to the music of Stravinsky, the Expressionists, the Neoclassicists, Bartok, the Minimalists, and more recent developments. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; MUS F221 or MUS F222; or permission of instructor.*** (3+0)

MUS F426 **Music Literature** (h)
2 Credits
Music literature of brass, strings, keyboard, voice or winds, on a rotating basis as announced for the semester of offering. Course may be repeated four times for a total of 10 credits. ***Prerequisites: MUS F261 or equivalent; or permission of instructor. Recommended: MUS F221; MUS F222, and one course from the MUS F421-F424 Period Music History course sequence.*** (2+0)

MUS F431 **Counterpoint** (h)
3 Credits
Contrapuntal techniques by means of analysis and synthesis of pieces in contrapuntal idioms. (3+0)

MUS F432 **Orchestration and Arranging** (h)
3 Credits
Instrumentation and arranging for vocal and instrumental ensembles. (3+0)

MUS F433 **Seminar in Musical Composition** (h)
2-3 Credits
Development of compositional skills based upon the works of predominately 20th-century composers. May be repeated for credit. ***Prerequisites: MUS F232 or equivalent; permission of instructor.*** (2-3+0)

MUS F434 **Advanced Harmonic Analysis** (h)
3 Credits
Strengthens understanding of functional harmony through a series of case studies with each gradually increasing in analytical difficulty. Chromatic music of late-19th century European art music, represented by composers such as Chopin, Franck and Scriagin. ***Prerequisites: MUS F232 or equivalent, or permission of instructor.*** (3+0)

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MUS F435 **Private Lessons in Music Composition** (h)
2-4 Credits Offered as Demand Warrants
Private instruction in advanced music composition consisting of one private lesson per week. Repeatable for credit. ***Prerequisites: MUS F433 or equivalent; audition; permission of instructor. Course may not be audited.*** (1-2+3)

MUS F461 **Private Lessons** (h)
2 or 4 Credits
Private instruction in piano, organ, voice, guitar, orchestral and band instruments. Private instruction shall consist of one private lesson per week. Music performance majors must enroll for 4 credits for MUS F361-F462 levels of study. All other students will normally enroll for 2 credits, except where special permission is granted. See accompanying box for private lesson fees. Special fees apply. ***Prerequisites: Admission by audition. Special permission required. Note: Course may not be audited. Credit-No Credit grading not permitted. Concurrent enrollment in MUS F190: Recital Attendance required.*** (2 or 4+0)

MUS F462 **Private Lessons** (h)
2 or 4 Credits
Private instruction in piano, organ, voice, guitar, orchestral and band instruments. Private instruction shall consist of one private lesson per week. Music performance majors must enroll for 4 credits for MUS F361- F462 levels of study. All other students will normally enroll for 2 credits, except where special permission is granted. Special fees apply. ***Prerequisites: Admission by audition. Special permission required. Note: Course may not be audited. Credit-No Credit grading not permitted. Concurrent enrollment in MUS F190: Recital Attendance required.*** (2 or 4+0)

MUS F490 **Senior Recital**
0 Credits
Full length music solo recital. Graded Pass/Fail. ***Prerequisites: MUS F362 or equivalent; MUS F390 or equivalent; music major; senior standing in music study; permission of instructor.*** (0+0)

MUS F601 **Introduction to Graduate Study**
3 Credits
Materials, techniques and procedures for research in music. Examination of bibliographic sources. Required of all graduate students in music. Students should register for this class during their first fall semester in residence. ***Prerequisites: Provisional admission to graduate study and permission of instructor.*** (3+0)

MUS F606 **Advanced Chamber Music**
1-2 Credits
Advanced string, woodwind, brass, vocal chamber music, piano chamber music and accompanying. ***Prerequisites: MUS F307; graduate standing; and permission of instructor. Course may not be audited.*** (0+3 or 6)

MUS F607 **Seminar in Elementary and Secondary General Classroom Music**
3 Credits
Discussion of the theoretical basis for developing objectives for general and classroom music in the elementary and secondary schools. Evaluation of current curricula, methods and materials with respect to stated objectives. Evaluative methods in music. ***Prerequisite: Permission of instructor.*** (3+0)

MUS F608 **Seminar in Secondary Music Education**
2 Credits
Examination of current trends and problems in all aspects of secondary music education. Emphasis on curriculum development, philosophy and goals, instrumental and choral program administration, and aspects of music learning and evaluation. ***Prerequisites: Permission of instructor.*** (2+0)

MUS F625 **Topics in Music History**
3 Credits
Detailed study of selected topics in music history and/or literature. Specific topic to be announced in advance of course offering. (3+0)

MUS F626 **Advanced Music Literature**
2 Credits
Advanced music literature of brass, strings, keyboard, voice or winds, on a rotating basis as announced each semester. Course may be repeated up to four times for a total of 10 credits. ***Prerequisites: MUS F461 or equivalent, or permission of instructor. Recommended: MUS F221; MUS F222; and/or courses from the MUS F421-F424 sequence.*** (2+0)

MUS F631 **Seminar in Music Theory: History and Pedagogy**
3 Credits
Historical development of music theory and music theory pedagogy (current teaching practices and survey of available teaching materials). ***Prerequisites: Permission of instructor.*** (3+0)

MUS F635 **Graduate Private Lessons in Composition**
2-4 Credits
Private instruction in advanced music composition consisting of one private lesson per week. Repeatable for credit. ***Prerequisites: Graduate standing; MUS F433 or equivalent: audition; permission of instructor. Course may not be audited. Recommended: Familiarity with computer-assisted music score preparation software.*** (1-2+3)

MUS F651 **Advanced Conducting and Rehearsal Techniques**
2-3 Credits
Study of conducting style and techniques and their application to representative compositions for different instrumental and vocal mediums. Repeatable for credit. ***Prerequisites: MUS F351 or equivalent; graduate standing; or permission of instructor.*** (2-3+0)

MUS F661 **Advanced Private Lessons**
2 or 4 Credits
Private instruction in piano, voice, or orchestral instruments consisting of one private lesson per week. Repeatable for credit. Course may not be audited. Special fees apply. ***Prerequisites: Special permission required. Graduate standing; MUS F462 or equivalent; audition. Note: Course may not be audited.*** (2 or 4+0)

MUS F690 **Graduate Recital**
0 Credits
Full length solo performance recital. Graded Pass/Fail. ***Prerequisites: MUS F490 or equivalent; graduate standing in applied music study; permission of instructor.*** (0+0)

MUSIC EDUCATION

MUED F110 **Becoming a Music Teacher in the 21st Century**
2 Credits
Introduction and exploration of the profession of music education. Focus on national educational policies and practices in education and music education. Opportunities for interaction with Alaska teachers, student teachers and students in the music education program. ***Prerequisites: ENGL F111X.*** (2+0)

MUED F201 **Introduction to Music Education**
2 Credits
Introduction to professional education with special emphasis on music education as practiced at the elementary, middle school and high school levels. Review of cultural, social, and current legal requirements that influence education and music education in the U.S. and Alaska. ***Prerequisites: ENGL F111X; ENGL F211X; MUED F110.*** (2+0+1)

MUED F309 **Elementary School Music Methods**
3 Credits
Principles, procedures and materials for teaching music to children at the elementary level. Cross-listed with ED F309. (3+0)

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MUED F310 Practicum in Elementary Music Methods
1 Credit
Students will observe and reflect upon weekly fieldwork in elementary public school classrooms, grades K-5. Additionally, students will assist with and lead live classroom activities. For preservice music educators. ***Co-requisites: MUED F309. Recommended: ED F201.*** (0.5+1.5)

MUED F315 Music Methods and Techniques
2 Credits
Instruction in voice and the basic instruments of band and orchestra. Emphasis on teaching methods. Course may be repeated for credit. See music department handbook. Special fees apply. ***Prerequisites: Permission of instructor.*** (1+2)

MUED F316 Practicum in Middle-Level Music Methods
1 Credit
Students will observe and reflect upon weekly fieldwork in grades 4-6 beginning instrumental music classes. Additionally, students will assist with and lead live classroom activities. For preservice music educators. ***Prerequisites: MUS F315; any music techniques/methods course plus concurrent enrollment in a second MUS F315 course. Recommended: ED F201.*** (0.5+1.5)

MUED F405 W Secondary School Music Methods
3 Credits
Principles and methods of teaching music in junior and senior high school with emphasis on philosophies, management, objectives, teaching techniques, choral and general music programs. Includes use of teaching plans in classroom and rehearsal settings. Note: Should be taken prior to ED F453. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; permission of instructor.*** (2+3)

MUED F406 Practicum in Secondary Music Methods
1 Credit
Students will observe and reflect upon weekly fieldwork in a local middle or high school. Additionally, students will assist with and lead live classroom activities. For preservice music educators. Taken concurrently with MUED F405, Secondary Schools Music Methods. (0.5+1.5)

MUED F610 Historical and Contemporary Issues in Music Education
3 Credits
Overview of historical and contemporary issues in music education, including the early years in America, music education since 1950, professional organizations, philosophy, curricular approaches, comprehensive musicianship, the standards movement, assessment, multicultural music education and impact of technology. ***Prerequisites: Graduate standing in a music degree program. Recommended: One year of K-12 teaching experience.*** (3+0)

NATURAL RESOURCES MANAGEMENT

NRM F101 Natural Resources Conservation and Policy
3 Credits Offered Fall
Conservation of natural resources including history, ecological and social foundations. Examines principles of sustained yield, carrying capacity, supply and demand, and world population growth as applied to agriculture, range, forest, wildlife, fisheries, recreation, minerals and energy management. A wide range of perspectives is presented to help students develop a personal philosophy toward natural resources. Prepare a multiple resource observation plan for an undeveloped area on campus. Optional all-day field trips take place the first two Saturdays of the semester. ***Prerequisites: Placement in ENGL F111X.*** (3+0)

NRM F102 Practicum in Natural Resources Management
1-2 Credits
Practical experience in natural resources management. Supervised individual study on a farm, in a greenhouse, managed forest, agency or business, or another approved location. Graded Pass/Fail. ***Prerequisites: Natural Resource Management majors only and permission of instructor.*** (1-2+0)

NRM F106 Orientation to Natural Resource Management
1 Credit Offered Spring
Overview of career opportunities in natural resources. Includes discussions with research faculty and upper class students involved in various aspects of resource management issues. Graded Pass/Fail. (1+0)

NRM F107 Leaves in Our Lives: Food
1 Credit Offered Spring As Demand Warrants
Learn to appreciate the plants in your life. For gardeners or anyone who eats plants. Plant biology will be introduced from the ground up and related to plant use by human civilizations, especially as food. This course is taught in Palmer. ***Recommended: Placement in ENGL F111X.*** (1+0)

NRM F108 Leaves in Our Lives: Diversity
1 Credit Offered Spring As Demand Warrants
Learn to appreciate the plants in your life. For gardeners or anyone who eats plants. Plant biology and diversity will be introduced and related to plant use by human civilizations, such as food, wood and medicine. This course is taught in Palmer. (1+0)

NRM F109 Leaves in Our Lives and Fungi
1 Credit Offered Spring As Demand Warrants
Learn to appreciate the plants in your life. For gardeners or anyone who eats plants. The biology of plants and fungi will be introduced and related to their use by human civilizations as food and drink. This course is taught in Palmer. ***Recommended: Placement in ENGL F111X.*** (1+0)

NRM F161 Wilderness Leadership Education
3 Credits Offered Summer As Demand Warrants
Introduction to outdoor education. Includes both theoretical and practical exposure to quality judgment and decision-making, environmental education techniques and leadership development in the wilderness setting. Provides detailed exposure to the Wilderness Education Association's 18 essential components of wilderness leadership and backcountry safety. The field portion of the course includes detailed instruction in and mentored experience with modern backcountry travel techniques. Successful completion earns certification in the Wilderness Stewardship Program. Field program requires travel through rough un-trailed terrain with heavy packs and average strength and stamina. No use of alcohol, tobacco, illegal drugs or firearms. Special fees apply. ***Prerequisites: Permission of instructor. Recommended: BIOL F104X, NRM F101 and physical geography.*** (3+0)

NRM F204 Public Lands Law and Policy
3 Credits Offered Fairbanks: Spring; Offered Palmer: Even-numbered Years
Background on selected federal lands management legislation and agency policies affecting resources conservation, development and preservation. (3+0)

NRM F211 Introduction to Applied Plant Science
3 Credits Offered Fall
Basic principles and requirements for plant growth and development with special attention to the production and management of field and greenhouse grown crops. (2+3)

NRM F212 Greenhouse Management
3 Credits Offered Spring
The greenhouse as a controlled environment for research, education and commercial production of plants; the physical environment; environmental controls and monitors; plant cultivation techniques and crop scheduling useful in plant science and commercial production. (3+0)

NRM F215 Plant Propagation
3 Credits Offered Fall
Principles and practices of plant propagation useful in horticulture, botany, forestry, agronomy, revegetation projects and plant research. Emphasis on both macro- and micro-propagation (tissue culture) of Alaska native plants by seeds, spores and vegetative propagules such as cuttings. ***Prerequisites: NRM F211 or permission of instructor.*** (2+3)

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NRM F251 **Silvics and Dendrology**
4 Credits Offered Spring
Ecological requirements and characteristics of tree species of the Northern forest and western North American forest. Silvical characteristics including range, climate, soils, shade tolerance, growth and principal enemies. Family and species characteristics for identification on sight or with a key. Field trips required. ***Prerequisites: BIOL F115X; BIOL F116X; BIOL F271; or permission of instructor.*** (3+3)

NRM F277 **Introduction to Conservation Biology**
3 Credits Offered Spring
Introduction to the basic ecological, genetic, management, legal and historical developments in conservation biology and focused efforts to manage biological diversity resources, with a status review of important habitats and endangered species. ***Prerequisites: BIOL F115X; BIOL F116X.*** Cross-listed with BIOL F277. (3+0)

NRM F290 **Resource Management Issues at High Latitudes**
2 Credits
Broad perspective of high latitude resource management issues. On-site analyses of resource management needs, opportunities and/or conflicts in agriculture, forestry, mining, seafood, petroleum, recreation and tourism. Includes 10 day field trip at the end of spring semester. Students must provide own sleeping gear, rain gear and hiking boots. Students must be able to hike forest trails and camp under conditions of inclement weather. May be repeated for credit with instructor's permission. Special fees apply. ***Prerequisite: Permission of instructor.*** (2+0)

NRM F300 **Internship in Natural Resources Management and Geography**
1-6 Credits Offered as Demand Warrants
Supervised pre-professional experience in a business or agency (public or private). Open to students majoring or minoring in natural resources management and geography only. Course may be repeated for credit up to a maximum of 6 credits. ***Prerequisites: NRM F101 for natural resources management majors or GEOG F101 for geography majors; junior standing with 3.0 GPA; permission of instructor and an approved internship plan.*** Cross-listed with GEOG F300. (1-6+0)

NRM F303X **Environmental Ethics and Actions** (h)
3 Credits Offered Spring
Exploration of the history of modern Western views of the relationship between people and nature, alternative foundations for an environmental ethic (utilitarianism, spiritual activity, rights-based and respect-based ethics) and practices of such ethics in business, profession and general lifestyle today. ***Prerequisites: Junior standing; placement in ENGL F111X or higher; or permission of instructor.*** (3+0)

NRM F304 W,O **Perspectives in Natural Resources Management**
3 Credits Offered Fall
Analysis of philosophical/ethical, economic, scientific and political foundations of diverse natural resource management perspectives. ***Prerequisites: COMM F131X or COMM F141X; NRM F101; junior standing; or permission of instructor.*** (3+0)

NRM F312 **Introduction to Range Management**
3 Credits Offered Fall Even-numbered Years
Applied ecological treatment of soil, plant and grazing animal relationships on uncultivated lands. Origin of the discipline, management practices and important rangelands of North America; emphasis on Alaska's rangelands and grazers. ***Prerequisites: BIOL F115X; BIOL F116X; BIOL F239; or permission of instructor. Recommended: NRM F320; NRM F321.*** (3+0)

NRM F313 **Introduction to Plant Pathology**
4 Credits Offered Spring Odd-numbered Years
Plant pathology; non-parasitic and parasitic causes of plant diseases; methods of plant infestation and mechanism of plant defenses; epidemiology and disease control. ***Prerequisites: BIOL F115X; BIOL F116X. Recommended: BIOL F239.*** (3+3)

NRM F320 **Animal Science**
3 Credits Offered Fall Even-numbered Years
Introduction to the various disciplines that form the study of animal science. Topics include animal nutrition, physiology of reproduction and lactation, genetics and animal breeding, animal behavior, environmental physiology, animal health and welfare. Information is presented as it applies to traditional and non-traditional livestock species with emphasis on applications pertinent to Alaska. ***Prerequisites: BIOL F115X; BIOL F116X.*** (2+3)

NRM F338 **Introduction to Geographic Information Systems**
3 Credits Offered Fall
Geographic data concepts including mapping systems, data sources, editing data, GIS analysis and computer mapping. Introduction to global positioning systems. GIS applications in natural resources management. ***Prerequisites: Knowledge of PC's or Unix workstations desirable.*** Cross-listed with GEOG F338. (2+3)

NRM F340 **Natural Resources Measurement and Inventory**
3 Credits Offered Fall
Techniques and instrumentations used to measure and inventory natural resources, including land, timber, range, wildlife, water and recreation resources. ***Prerequisites: Junior standing or permission of instructor.*** (2+3)

NRM F361 **Advanced Wilderness Leadership Education**
3 Credits Offered Summer, As Demand Warrants
The natural environment, concentrating on outdoor leadership, environmental ethics, minimum impact camping, forest and arctic natural history, and adaptable judgment and decision-making. Includes hiking through boreal forest and along tundra ridges, river crossing, glacier ascent, and skills to do these activities safely. Other mediums of travel could include sea kayaks, canoes or rock climbing. Three lecture sessions will preview a demanding educational field program of 5-15 days requires travel through rough un-trailed terrain with heavy packs or boats and average strength and stamina. No use of alcohol, tobacco, illegal drugs or firearms. ***Prerequisites: NRM F101 or equivalent; NRM F161 or equivalent; permission of instructor. Recommended: NRM/GEOG F463 and NRM F465.*** (3+0)

NRM F365 **Principles of Outdoor Recreation Management**
3 Credits Offered Fall
Theories, practices, economics and problems fundamental to the use of land and related natural resources for recreation. The course focuses on human dimension related issues faced by recreation managers and research to address those issues. ***Prerequisites: NRM F101; junior standing; or permission of instructor.*** (3+0)

NRM F369 **GIS and Remote Sensing for Natural Resources**
3 Credits Offered Spring Even-Numbered Years
Introduces the principles and terminology of natural resources, ecosystem management and landscape ecology while developing analytical skills using spatial technologies consisting of geographic information systems, remote sensing, and global positioning systems. ***Prerequisites: NRM F338 Recommended: NRM F312*** (1.5+1.5)

NRM F370 **Introduction to Watershed Management**
3 Credits Offered Fall
The hydrologic cycle and the influence of land management techniques on water quantity, quality and timing. Water yield, soil erosion and non-point pollution, snowpack management, and land use alternatives. ***Prerequisites: NRM F101 and GEOS F101X or permission of instructor.*** (2+3)

NRM F375 **Forest Ecology**
3 Credits Offered Fall
Basic forest ecology concepts, including physical (wind, temperature, water, etc.), biotic (population and community dynamics), genetic and successional and landscape dynamics and how this basic information can be used in development of wise management plans for forest ecosystems. The laboratory will cover basic principles of measurement of the forest resource and will include field work for the first six weeks followed by laboratory analysis of collected

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samples and preparation of a detailed report describing the ecology of the measured forest. Due to the short snow-free field season, the first laboratory session will be a full introduction to the field procedures that will be used throughout the first six weeks. ***Prerequisites: NRM F251.*** (2+3)

NRM F380 W **Soils and the Environment**
3 Credits Offered Fall
Soil development and classification; physical and chemical properties; biological activity; water movement and nutrient cycling in natural and manipulated ecosystems. ***Prerequisites: CHEM F105X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** (2+3)

NRM F405 W **Senior Thesis in Natural Resources Management I**
2 Credits
Problem-solving with emphasis on writing and analysis. Individual project under the guidance of faculty sponsor involving formulation of a question in natural resources management and preparation of a formal, comprehensive written report. Thesis proposal, presentation and research. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; NRM core; junior standing.*** (2+0)

NRM F406 W **Senior Thesis in Natural Resources Management II**
2 Credits
Problem-solving with emphasis on writing and analysis. Individual project under the guidance of faculty sponsor involving formulation of a question in natural resources management and preparation of a formal, comprehensive written report. Final thesis and presentation. ***Prerequisites: NRM F405 and permission of instructor.*** (2+0)

NRM F407 **Environmental Law**
3 Credits Offered Spring Odd-numbered Years
The role of common law theory in regulatory, statutory and constitutional interpretation in the field of environmental protection, including air and water pollution, toxic/hazardous substances and land-use regulation. ***Prerequisites: Junior or senior class standing or permission of instructor.*** (3+0)

NRM F410 **Numerical Methods for Natural Resources Management**
4 Credits Offered Fall
Teaches the most up-to-date numerical methods for natural resources managers and researchers. Labs cover important computer skills to help students excel in modern natural resources management. ***Recommended: MATH F314*** (3+3)

NRM F430 **Resource Management Planning**
3 Credits Offered Spring
Application of planning and conflict resolution principles to natural resources management. Examines plans prepared in response to current Alaska resource disputes, including wolf, brown bear, boreal forest and recreation river plans. Includes public involvement, consensus building, the basic steps in the planning process and resource dispute simulations. Review resource management plans and develop plans for a local resource management issue. ***Prerequisites: Senior standing or permission of instructor.*** Stacked with NRM F630. (3+0)

NRM F431 **Wildlife Law and Policy**
3 Credits Offered Spring
Study of laws and agencies shaping wildlife management in North America. History and current status of major policy issues. Organization of and funding sources for state and federal programs in wildlife conservation. ***Prerequisites: A 3 credit course in wildlife management principles or permission of instructor.*** Cross-listed with WLF F431. (3+0)

NRM F432 **Literature of Science and the Environment** (h)
3 Credits Offered as Demand Warrants
Reading, analysis and discussion of classic and contemporary works in science, natural history and environmental literature. Some semesters all of the readings will follow one theme; other semesters a variety of fiction, poetry, oral tradition and nonfiction will be considered. Readings are selected from a spectrum of opinion on the relationship of people to the natural world and both analytical and creative writing are required. Resource management professionals and students in the sciences and humanities are welcome. May be repeated once for additional credit. ***Prerequisites: Senior standing or permission of instructor.*** Cross-listed with NORS F432. Stacked with NRM F632; NORS F632. (3+0)

NRM F435 **GIS Analysis**
4 Credits Offered Spring
GIS analysis of natural resources including spatial query, attribute query, vector, grid, image, topographic and network analysis techniques. Cross-listed with GEOG F435. (3+3)

NRM F440 **Silviculture**
3 Credits Offered Fall Even-numbered Years
Provides an understanding of the science and art of forest stand management. Silveculture is the theory and practice of controlling forest establishment, composition, structure and growth of forests. For persons in land management, including timber, woodlot, wildlife habitat, streamside and aesthetics. ***Prerequisites: BIOL F271; NRM F251; junior standing; or permission of instructor.*** (2+3)

NRM F450 **Forest Management**
3 Credits Offered Spring Odd-numbered Years
Forest land management for production of goods and services; relation of timber production to other forest land uses. Sustained yield, allowable cut, information needs, valuation and decision making. ***Prerequisites: ECON F235 or equivalent; NRM F251; NRM F340; or permission of instructor.*** (3+0)

NRM F452 **Forest Health and Protection**
3 Credits Offered Spring Even-numbered Years
Principles and practical management systems for protecting forests from fire, insects and diseases. Factors in managing forest ecosystems and problems and techniques important in high latitude forests, especially in Alaska. ***Prerequisites: BIOL F115X; BIOL F116X; BIOL F239; BIOL F271; NRM F251; or permission of instructor.*** (3+0)

NRM F453 **Harvesting and Utilization of Forest Products**
3 Credits Offered Fall Odd-numbered Years
Manual and mechanized timber harvesting systems including timber cutting, yarding and transport processes. Technology of processing wood into various products including lumber, plywood, veneer, pulp and energy. Introduction to supply and demand of forest products from a world, state and local perspective. Labs include visits to local forest products companies, chainsaw safety and wood identification. ***Prerequisites: NRM F101 or permission of instructor.*** (2+3)

NRM F459 **Boreal Forest Management and Soils**
1 Credit Offered Summer Even-numbered Years; As Demand Warrants
Field trip in the Tanana Valley to focus on forest management and soils. Includes sites from Fairbanks to Northway and south to the Alaska Range. Includes soils of aeolian, glacial, fluvial and residual landforms, supporting conifer, mixed conifer-hardwood and hardwood forests. Includes wildfire sites, young plantations, immature forest stands, mature forest, subalpine and thermokarst sites. Requires appropriate clothing/foot gear; provide own camping gear (sleeping bag, bedroll); able to walk on uneven or rocky ground through brush; physically fit for long days and field work. Graded Pass/Fail. Special fees apply. ***Prerequisites: Soils course; ecology course; B.S. in Agriculture or Natural Resources; or permission of instructor.*** Stacked with NRM F659. (0.5+0+30)

NRM F461 **Interpretive Services**
3 Credits Offered as Demand Warrants
Naturalist and other visitor programs in outdoor recreation areas: philosophy, planning and development of interpretive programs; resources, agencies, users, interpretive media and program evaluation. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

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NRM F463 **Wilderness Concepts**
3 Credits Offered Fall
Discovery of wilderness concepts, including the history and evolution of wilderness thought, the contemporary meaning of wilderness and survey of economic and noneconomic wilderness values for individuals and society. Cross-listed with GEOG F463. Stacked with GEOG F663; NRM F663. (3+0)

NRM F464 **Wilderness Management**
3 Credits Offered Spring
Wilderness ecology and land management practices on lands designated as wilderness. Analysis of visitor management regimes. Both national and international views of wilderness are presented. ***Prerequisites: A basic course in ecology, resource management, or permission of instructor.*** Cross-listed with GEOG F464. (3+0)

NRM F465 **Outdoor Recreation Planning**
3 Credits Offered Spring Even-numbered Years
Outdoor recreation planning frameworks with an emphasis on experience-based management. Research methods to support outdoor recreation planning, including survey design, sampling in different planning situations and data analysis. ***Prerequisites: ECON F235 or equivalent; NRM F101; or permission of instructor.*** (3+0)

NRM F466 **Environmental Soil Chemistry**
3 Credits Offered Spring Odd-numbered Years
Basic principles of soil chemical processes. Covers soil solution chemistry; precipitation/dissolution and soil colloids; soil solid phase; soil acidity/alkalinity; adsorption and ion exchange; reduction/oxidation reactions; and kinetics of soil chemical processes. In the lab students will operate equipment for soil chemical analysis, experience computer simulation models for soil chemistry and become familiar with the terms and approaches for writing technical reports. ***Prerequisites: CHEM F105X; CHEM F106X; NRM F380.*** (2+3)

NRM F480 **Soil Management for Quality and Conservation**
3 Credits Offered Fall Odd-numbered Years
Managing soil in disturbed and natural ecosystems to reduce soil losses and maintain or improve soil quality. Methods for maintaining soil quality, preserving soil against loss from erosion, remediating contaminated soil and reclaiming degraded soils. ***Prerequisites: NRM F380.*** (3+0)

NRM F482 **Why do Boreal Forests Matter?**
1 Credit Offered Summer; As Demand Warrants
Introduction to the importance of boreal forests. Includes presentations by scientists and professionals, readings, and first-hand observations of components and process at work in the forest. Course is for non-forestry professionals and non-forestry majors. (Note: Be prepared for the typical demands of a field situation. Requires walking short distances over rough, uneven and wet terrain. Appropriate clothing is required.) Graded Pass/Fail. (0.5+1)

NRM F485 **Soil Biology**
3 Credits Offered Spring Even-numbered Years
Major groups of organisms in the soil and their interrelationships; the major biological processes which take place in the soil and their significance to soil productivity, plant growth and environmental quality; and methodology for studying soil organisms and soil biological processes. ***Prerequisites: A course in biology or microbiology and a course in soils or permission of instructor.*** (3+0)

NRM F487 W,O **Fisheries Management**
3 Credits Offered Spring
Theory and practice of fisheries management, with an emphasis on strategies utilized for the management of freshwater and marine fisheries. Application of quantitative methodologies for the assessment and manipulation of aquatic habitats, sport and commercial fish populations, and stock assessment are considered, as is the setting of appropriate goals and objectives for effective, science-based management. ***Prerequisites: BIOL F271; COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; ENGL F414; FISH F425; FISH F405 or FISH F410; or permission of instructor.*** Cross-listed with FISH F487. (3+0)

NRM F488 **Land Management of Ecosystems**
3 Credits Offered Spring
Natural resource topics related to the management of the terrestrial environment in regions such as the Pacific Northwest, Hawaii and the circumpolar North. A basic understanding of the ecology of a specific region is presented prior to a spring break field trip designed to give the student a broad understanding of important topics affecting the management of important natural resources in the selected region. Special fees apply. ***Prerequisites: NRM F211; NRM F277; NRM F375 or BIOL F271.*** Stacked with NRM F688. (3+0+40)

NRM F489 **Alaska Soil Geography Field Trip**
1 Credit Offered Summer; As Demand Warrants
Soil geography along ecological transect in selected areas of Alaska. Hands-on experiences on soil morphology and exposure of the relationships between soil genesis and other ecological factors including vegetation, geology, landform, climate and hydrology. Includes discussion of soil classification and land use interpretations. Student must provide their own camp gear, be able to walk on uneven or rocky ground and be physically fit for field work. Graded Pass/Fail. Special fees apply. ***Prerequisites: NRM F380, or a course in soils, or permission of instructor.*** Stacked with NRM F689. (1+0)

NRM F601 **Research Methods in Natural Resources Management**
2 Credits Offered Fall
Introduction for graduate students to the research methods employed in the various fields of resource management, including agriculture, forestry, ecology and social sciences. Designed to acquaint students with the relationship between theory and research, the nature of scientific inquiry, approaches to research, the sequence of steps involved in scientific investigation and the presentation of research results. ***Prerequisites: Graduate standing or permission of instructor.*** (2+0)

NRM F613 **Resilience Internship**
2 Credits Offered Fall
Students of the Resilience and Adaptation Program participate in internships to broaden their interdisciplinary training, develop new research tools and build expertise outside their home disciplines. Internships are for eight to ten weeks of full-time commitment and take place during the student's first summer in the program. In the autumn students meet to discuss their internship experiences and make public presentations. ***Prerequisites: ANTH/BIOL/ECON/NRM F667; or ANTH/BIOL/ECON/NRM F668; or permission of instructor.*** Cross-listed with ANTH F617; BIOL F613; ECON F613. (2+0)

NRM F616 **Ecological Background for Resilience and Adaptation**
1 Credit Offered Fall
Provides the ecological background that is necessary for understanding the role of ecology in complex systems involving interactions among biological, economic, and social processes. Designed for incoming students of the Resilience and Adaptation Program (RAP), who have not received training in ecology. ***Prerequisites: Graduate student enrollment or permission of instructor.*** Cross-listed with BIOL F616. (1+0)

NRM F630 **Resource Management Planning**
3 Credits Offered Spring
Application of planning and conflict resolution principles to natural resources management. Examines plans prepared in response to current Alaska resource disputes, including wolf, brown bear, boreal forest and recreation river plans. Includes public involvement, consensus building, the basic steps in the planning process, and resource dispute simulations. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with NRM F430. (3+0)

NRM F631 **Resource Planning Practicum**
3 Credits Offered as Demand Warrants
Application of principles and processes through group projects focused on Alaska land or resource problems. ***Prerequisites: NRM F630 or permission of instructor.*** (3+0)

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NRM F632 **Literature of Science and the Environment**
3 Credits Offered as Demand Warrants
Reading, analysis and discussion of classic and contemporary works in science, natural history and environmental literature. Some semesters all of the readings will follow one theme; other semesters a variety of fiction, poetry, oral tradition and nonfiction will be considered. Readings are selected from a spectrum of opinion on the relationship of people to the natural world and both analytical and creative writing are required. Resource management professionals and students in the sciences and humanities are welcome. May be repeated once for additional credit. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with NORS F632. Stacked with NORS F432; NRM F432. (3+0)

NRM F634 **Resource Management in Developing Countries**
2 Credits Offered Spring
Complex relationship between sustainable development and the social, economic and environmental conditions in low income countries of the "Global South." Through lectures, readings, films and structured discussions, we examine major contemporary issues facing low-income societies (e.g. urbanization, migration, agricultural development, deforestation, water shortages, rural poverty, gender and development, environmental degradation and sustainable development). Case study readings will draw upon empirical research from Latin America, Africa and Asia. (2+0)

NRM F637 **Evolution of Conservation Concepts and Policy**
3 Credits Offered Spring
Resource policy issues development and implementation including forestry, mining, fisheries, oil, wildlife and other topics as demand warrants. Focus on policy issues involved in management of Alaska's resources. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with ECON F637. (3+0)

NRM F638 **GIS Programming**
3 Credits Offered Spring Odd-numbered Years
GIS programming for ArcView, Arc/Info and ArcGIS. Programming techniques for customizing GIS, efficient batch processing, and development of custom tools for GIS display and analysis. ***Prerequisites: NRM F338 or equivalent.*** (3+0)

NRM F640 **Simulation and Modeling in Resource Management**
3 Credits Offered Spring Even-numbered Years
Introduction to and discussion of the use of simulation and modeling in natural resource management. Emphasis on concepts, strategies and case studies. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

NRM F641 **Natural Resource Applications of Remote Sensing**
4 Credits Offered Spring Even-numbered Years
Application of remote sensing for inventory and analysis of natural resources. Topics include aerial photography applications and digital remote sensing, including image display, rectification, classification and accuracy assessment. ***Prerequisites: NRM F338 or equivalent.*** (3+3)

NRM F647 **Global to Local Sustainability**
3 Credits Offered Fall
Explores the basic principles that govern resilience and change of ecological and social systems. Principles are applied across a range of scales from local communities to the globe. Working within and across each of these scales, students address the processes that influence ecological, cultural and economic sustainability, with an emphasis on northern examples. ***Prerequisites: Graduate standing in a natural science, social science, humanities or interdisciplinary program at UAF; and permission of instructor.*** Cross-listed with ANTH F647; BIOL F647; ECON F647. (3+0)

NRM F649 **Integrated Assessment and Adaptive Management**
3 Credits Offered Spring
Interdisciplinary exploration of theoretical and practical considerations of integrated assessment and adaptive management. Concepts important in understanding societal and professional-level decision-making. Students work as individuals and as a team to undertake case studies with relevance to integrated assessment and adaptive management. Collectively, the class builds a portfolio of cases and conducts an integrated assessment. ***Prerequisites: Graduate student standing in a natural science, social science, humanities or interdisciplinary program at UAF or another university or permission of instructor. The course is designed to fit into the sequence of the Resilience and Adaptation program's core courses. It is open to other graduate students interested in and prepared to conduct interdisciplinary studies relating to sustainability. Recommended: ANTH/BIOL/ECON/NRM F647 and ANTH/BIOL/ECON/NRM F667 (previously or concurrently). In case of enrollment limits, priority will be given to graduate students in the Resilience and Adaptation program in order for them to be able to meet their core requirements.*** Cross-listed with ANTH F649; BIOL F649; ECON F649. (3+0)

NRM F651 **Advanced Silviculture**
3 Credits Offered Spring Odd-numbered Years
Examines biological and environmental aspects of silviculture. Addresses stand manipulation from the "silvicultural system" approach and includes regeneration, vegetation management, stand tending, "harvest" with considerations for biodiversity, "old- growth," wildlife habitat and timber production. Ecological classification, landscape management and pre-harvest silvicultural prescriptions will be addressed. Must be able to participate in one weekend field trip. ***Prerequisites: Graduate standing and permission of instructor.*** (3+0)

NRM F659 **Boreal Forest Management and Soils**
1 Credit
Field trip in the Tanana Valley to focus on forest management and soils. Includes sites from Fairbanks to Northway and south to the Alaska Range. Includes soils of aeolian, glacial, fluvial and residual landforms, supporting conifer, mixed conifer-hardwood and hardwood forests. Includes wildfire sites, young plantations, immature forest stands, mature forest, subalpine and thermokarst sites. Requires appropriate clothing/foot gear; provide own camping gear (sleeping bag, bedroll); able to walk on uneven or rocky ground through brush; physically fit for long days of field work. Graded Pass/Fail. Special fees apply. ***Prerequisites: Soils course; ecology course; B.S. degree in Agriculture or Natural Resources; or permission of instructor.*** Stacked with NRM F459. (0.5+0+30)

NRM F663 **Wilderness Concepts**
3 Credits Offered Fall
History and evolution of wilderness thought, the contemporary meaning of wilderness, and survey of economic and noneconomic wilderness values for individuals and society. Cross-listed with GEOG F663. Stacked with NRM F463; GEOG F463. (3+0)

NRM F665 **Advanced Outdoor Recreation**
3 Credits Offered Fall Even-numbered Years
Evaluation of contemporary outdoor recreation management models and the linkage between management programming and visitor response. Development of a synthesized model and testing with contemporary problems. ***Prerequisites: Graduate standing.*** (3+0)

NRM F667 **Resilience Seminar I**
1 Credit Offered Fall
Provides a forum for new students of the Resilience and Adaptation graduate program to explore issues of interdisciplinary research that are relevant to sustainability. A considerable portion of the seminar is student-directed, with students assuming leadership in planning seminar activities with the instructor. Graded Pass/Fail. ***Prerequisites: Must be enrolled in the Resilience and Adaptation graduate program; or permission of instructor. Recommended: ANTH/BIOL/ECON/NRM F647 (taken concurrently).*** Cross-listed with ANTH F667; BIOL F667; ECON F667. (2+0)

NRM F668 **Resilience Seminar II**
1 Credit Offered Spring
Provides a forum for new students of the Resilience and Adaptation graduate program to explore issues of interdisciplinary research that are relevant to sustainability. The seminar provides support to each student planning his/her

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summer internship and preparing and presenting a thesis research prospectus. Graded Pass/Fail. ***Prerequisites: ANTH/BIOL/ECON/NRM F647; ANTH/BIOL/ECON/NRM F667; or permission of instructor.*** Cross-listed with ANTH F668; BIOL F668; ECON F668. (2+0)

NRM F670 Biometeorology
3 Credits Offered Fall Odd-numbered Years
Radiation and energy balance relationships for natural and modified surfaces; physical environment in relation to biology and ecology of plants and animals; implications for resource and environmental management. ***Prerequisites: Biological or physical science background; graduate standing; or permission of instructor.*** (3+0)

NRM F672 Nutrient Cycling
3 Credits Offered Spring Odd-numbered Years
Examination of physical, chemical and biological processes controlling nutrient element recycling, availability and retention in natural and managed ecosystems. ***Prerequisites: BIOL F271; CHEM F106X; NRM F380; or permission of instructor.*** (3+0)

NRM F675 Theoretical Forest Ecosystem Science
3 Credits Offered Spring Even-numbered Years
Theoretical concepts of forest ecosystem dynamics including theoretical developments in the description of plant growth, ecosystem productivity, decomposition and plant carbon allocation. Development of a model using the basic theoretical constructs. ***Prerequisites: Undergraduate major in biological sciences or renewable resources including at least one course in ecology, one approved college-level mathematics course and graduate standing; or permission of instructor.*** (3+0)

NRM F676 Interdisciplinary Modeling of High Latitude Global Change
4 Credits Offered Fall Even-numbered Years
Introduces students to approaches to modeling how regional and global environmental change influences biological and social systems in high latitudes and how the responses of these systems influence the regional and global functioning of the earth system. ***Prerequisites: STAT F200X or equivalent; graduate standing; or permission of instructor.*** Cross-listed with BIOL F676. (3+3)

NRM F678 Ecosystem Management
3 Credits Offered Spring Even-numbered Years
Current concepts being debated and used to manage renewable resources. Through reading, discussion and written exercises, students will develop understanding and applications of the concept as well as draft definitions. ***Prerequisites: B.S./B.A. with basic biology, wildlife, natural resources, forestry background, or demonstrated knowledge; seniors with permission of instructor only; public with knowledge/experience only; permission of instructor.*** (3+0)

NRM F685 Soil Microbiology and Biochemistry
3 Credits Offered as Demand Warrants
Current topics in soil microbiology and biochemistry. Based on readings from the primary literature and discussions in class. Each student will be expected to lead at least one discussion, write a research proposal and present the proposal to class. ***Prerequisites: At least one course in soil science; one course in microbiology; or permission of instructor.*** (3+0)

NRM F688 Land Management of Ecosystems
3 Credits Offered Spring
Natural resource topics related to management of the terrestrial environment in regions such as the Pacific Northwest, Hawaii and the circumpolar North. A basic understanding of the ecology of a specific region is presented prior to a spring break field trip designed to give the student a broad understanding of important topics affecting the management of important natural resources in the selected region. Special fees apply. ***Prerequisites: NRM F211; NRM F277; NRM F375 or BIOL F271.*** Stacked with NRM F488. (3+0+40)

NRM F689 Alaska Soil Geography Field Trip
1 Credit Offered Summer As Demand Warrants
Soil geography along an ecological transect in selected areas of Alaska. Hands-on experiences with soil morphology and exploration of the relationships between soil genesis and other ecological factors including vegetation, geology, landform, climate and hydrology. Includes discussion of soil classification and land use interpretations. Students must provide their own camp gear, be able to walk on uneven or rocky ground and be physically fit for field work. Graded Pass/Fail. Special fees apply. ***Prerequisites: NRM F380, or a course in soils, or permission of instructor.*** Stacked with NRM F489. (1+0)

NRM F692 Graduate Seminar
1 Credit
Topics in natural resources management and geography explored through readings, student presentations, group discussions and guest speakers. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with GOEG F692 (0+0+1)

NORTHERN STUDIES

For information on studying at McGill University, Montreal, Canada; the University of Copenhagen, Denmark; or opportunity for study in Russia, see Study Abroad.

NORS F205 Leadership, Citizenship and Choice
3 Credits
History of democratic principles in America and how people can contribute to political and community life in the local, state and national arenas as leaders and citizens. Examines ethical dilemmas of leadership, and political and social issues facing Alaska and American societies. Course includes an experiential learning component. Cross-listed with PS F205. (3+0)

NORS F425 W Visual Images of the North
3 Credits
Examination of the imagery of the people and landscapes of the polar regions, centering on such issues as depiction of arctic peoples and customs by Europeans, documentary versus artistic goals, translations from original sketches to published images, relationship of polar imagery to prevailing historical styles and the influence of changing world views on modes of polar representation between the 16th and 20th centuries. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** Cross-listed with ART F425. (3+0)

NORS F427 Polar Geography (s)
3 Credits Offered Spring
Comparative physical, cultural, political and economic geography of the circumpolar north and antarctic regions. Special attention given to arctic natural resource development and climate change in both polar regions. ***Prerequisites: GEOG F101 or GEOG F111X or GEOG F203; or permission of instructor.*** Cross-listed with GEOG F627. Stacked with GEOG F627; NORS F627. (3+0)

NORS F432 Literature of Science and the Environment (h)
3 Credits Offered Fall Even-numbered Years
Reading, analysis and discussion of classic and contemporary works in science, natural history and environmental literature. Some semesters all of the readings will follow one theme; other semesters a variety of fiction, poetry, oral tradition and nonfiction will be considered. Readings are selected from a spectrum of opinion on the relationship of people to the natural world and both analytical and creative writing are required. Resource management professionals and students in the sciences and humanities are welcome. May be repeated once for additional credit. ***Prerequisites: Senior standing or permission of instructor.*** Cross-listed with NRM F432. Stacked with NORS F632; NRM F632. (3+0)

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NORS F470 Oral Sources: Issues in Documentation (h)
3 Credits
Preparation for recording and use of oral resources. Examines how meaning is conveyed through oral traditions and personal narratives and the issues involved with recording and reproducing narratives. Includes management of oral recordings, ethical and legal considerations, issues of interpretation and censorship, and the use of new technologies to access and deliver recordings. ***Prerequisites: At least one undergraduate ANTH course and one undergraduate HIST course, or permission of instructor.*** Cross-listed with ANTH F470. Stacked with ANTH F670; NORS F670. (3+0)

NORS F484 W Seminar in Northern Studies (s)
3 Credits Offered Fall
An interdisciplinary seminar focusing on topics relating to the North with emphasis on the physical sciences, the peoples, and the socioeconomic and political aspects of the area. Specialists in the various fields will assign readings and conduct discussions. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; junior standing; or permission of instructor.*** (3+0)

NORS F486 Senior Seminar in Leadership and Civic Engagement (s)
3 Credits
Students are placed in contact with government and other agencies where they will gain practical experience applying principles of leadership and civic engagement. This is the capstone course for the minor in leadership and civic engagement. ***Prerequisites: NORS/PS F205. Recommended: The student's elective choices in the minor.*** (3+0)

NORS F600 Perspectives on the North
3 Credits
Basic knowledge of the circumpolar North — the social, economic, political and scientific facets of northern life. Consideration of major cultural groups of the North and their histories, the environmental settings and patterns of settlement and development in northern regions and systems of governance in different northern countries. Broad overview of the major policy issues of the North in education, justice, health care, and environmental and wildlife protection. Course is also available online. Cross-listed with HIST F600. (3+0)

NORS F601 Research Methods and Sources in the North
3 Credits
Development of students' research skills so they can engage in their own research on northern issues. Includes techniques of interviewing, conducting surveys, and sampling; qualitative and quantitative methods of research design; and familiarity with library sources and archival records. Each student will develop a research project. Course is also available online. (3+0)

NORS F603 Public Policy
3 Credits Offered Spring Even-numbered Years
The processes of policy development, implementation and change are analyzed along with major policy frameworks and models used in contemporary political science. These frameworks and models will be applied to environmental sustainability and other social policy issues. Students will develop expertise in a specific policy area and skills in research design preparing them to analyze public policy. ***Prerequisites: Graduate Standing.*** Cross-listed with PS F603. Stacked with PS F403. (3+0)

NORS F610 Northern Indigenous People and Contemporary Issues
3 Credits Offered Fall Odd-numbered Years
Comparative examination of issues affecting northern indigenous people from Alaska, Canada, Greenland and Russia. Issues include the impact of the alienation of land on which these people depend; the relationships between their small, rural microeconomies and the larger agroindustrial market economies of which they are a part; education, language loss and cultural transmission; alternative governmental policies toward indigenous peoples and contrasting world views. ***Prerequisites: Graduate standing or upper-division standing with permission of instructor.*** Cross-listed with ANTH F610. (3+0)

NORS F611 Environmental History
3 Credits Offered Spring Even-numbered Years
Discussion of significant works of environmental history. Cultural history of the landscape in world civilization with emphasis on Western Europe and North America. Discussion of interdisciplinary approaches to the history of environment and cooperative work across disciplines. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with HIST F411. (3+0)

NORS F613 Wilderness and Environmental Psychology
3 Credits
Examines the relationships between people and the natural and built environments. Topics include the effects of arctic environments on physical and psychological health; preferences for different types of natural settings; the design of residential and community environments in northern climates; and the symbolism of settings and effects on political controversies. ***Prerequisites: Graduate standing.*** (3+0)

NORS F616 Performance Studies Abroad
6 Credits
Intensive course for actors, directors, designers, technicians and playwrights interested in script development/training with the participation of international theatre professionals. Develop new scripts and performances in a multicultural environment under the supervision of a theatre faculty member. Previous faculty and student work abroad includes: Russia, Zambia, South Africa and Scandinavia. Course requirements vary according to the project. Stacked with THR F416. (3+9)

NORS F620 Images of the North
3 Credits
Emphasis on the variety of images created about the people and environment of the circumpolar North. Examination and interpretation of conceptualizations of the North as expressed in such different media as film, art, literature, travel journals and oral traditions. Cross-listed with ENGL F620. (3+0)

NORS F624 Field Artists of the North
3 Credits Offered as Demand Warrants
Study of field artists and their work, from the explorer artists of yesteryear to today's field artists using a variety of traditional and contemporary media in their creations. Students will conceive and conduct their own study projects, producing a body of work that will demonstrate the principles and practice of a field artist. ***Prerequisites: ART F105; studio art course (ART F161, ART F162, ART F163, ART F205, ART F211, ART F213 or JRN F203.)*** Cross-listed with ART F624. Stacked with ART F424. (3+0)

NORS F625 Visual Images of the North
3 Credits
Examination of the two-dimensional imagery of the people and landscapes of the polar regions, centering on such issues as depiction of arctic peoples and customs by Europeans, documentary vs. artistic goals, translations from original sketches to published images, relationship of polar imagery to prevailing historical styles, and the influence of changing world views on modes of polar representation between the 16th and 20th centuries. Cross-listed with ART F625. (3+0)

NORS F627 Polar Geography
3 Credits Offered Spring
Comparative physical, cultural, political and economic geography of the circumpolar north and antarctic regions. Special attention given to arctic natural resource development and climate change in both polar regions. ***Prerequisites: GEOG F101 or GEOG F203 or GEOG F111X; or permission of instructor.*** Cross-listed with GEOG F627. Stacked with GEOG F427; NORS F427. (3+0)

NORS F632 Literature of Science and the Environment
3 Credits
Reading, analysis and discussion of classic and contemporary works in science, natural history and environmental literature. Some semesters all of the readings will follow one theme; other semesters a variety of fiction, poetry, oral tradition and nonfiction will be considered. Readings are selected from

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a spectrum of opinion on the relationship of people to the natural world and both analytical and creative writing are required. Resource management professionals and students in the sciences and humanities are welcome. May be repeated once for additional credit. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with NRM F632. Stacked with NRM F432; NORS F432. (3+0)

NORS F640 Ethics and Reporting in the Far North
3 Credits
Historical overview of media coverage of the Northern frontier with focus on journalistic ethics. A comparison is made to the media climate in Third World countries. Cross-listed with JRN F640. Stacked with JRN F440. (3+0)

NORS F647 U.S. Environmental Politics
3 Credits Offered Spring
U.S. political institutions as they relate to making policies for protecting the quality of the natural environment. The politics of nuclear waste, endangered species, air and water pollution, and wilderness preservation. Analysis of the National Environmental Policy Act, sustainable development, limits to growth and other topics. Course is also available online. ***Prerequisites: Graduate Standing or permission of instructor.*** Cross-listed with PS F647. Stacked-with: PS F447. (3+0)

NORS F648 Environmental Politics of the Circumpolar North
3 Credits
Overview of how environmental politics and policy as a field of study relates to the Arctic region. Analysis of various threats to the northern environment, focusing on the policy making institutions at selected Arctic Rim nations, as well as strategies to deal with environmental problems in an international context. Course is also available online. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with PS F648. Stacked-with: PS F448. (3+0)

NORS F652 International Relations of the North
3 Credits
Examination of the international strategies of circumpolar states. Consideration of theoretical and practical elements of strategy formation in major issue areas such as national security, the political economy, human rights and scientific exchange. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with PS F652. Stacked with PS F452. (3+0)

NORS F653 Greenland: Home Rule and Self-determination
3 Credits
The history and political economy of Greenland with emphasis on development of the Home Rule government. Highlights Greenland's dynamic relationship with the world economy and efforts of the Home Rule government to pursue sustainable development. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

NORS F654 International Law and the Environment
3 Credits
International environmental law. Includes international case law regulating the sea, airspace, outer space and the polar regions; comprehensive international regulatory and legal instruments to protect the environment (e.g. the U.N. Framework Convention on Climate Change); and the doctrines, principles, and rules of international law that are basic to an understanding of international legal regimes and the environment. Course is also available online. ***Prerequisites: Graduate standing; permission of instructor. Recommended: Undergraduate course in international law, organization or politics.*** Cross-listed with PS F654. Stacked with PS F454. (3+0)

NORS F655 Political Economy of the Global Environment
3 Credits
Interactions between basic aspects of the global economy (international trade, investment and development) and the natural environment. Topics include the economic impact of global environmental agreements and the environmental impact of global markets, transnational corporations and development assistance by organizations such as the World Bank. ***Prerequisites: Graduate standing and permission of instructor.*** Cross-listed with PS F655. Stacked with PS F455. (3+0)

NORS F656 Science, Technology, and Politics
3 Credits
Relationship of science, technology and politics. Connections among scientific knowledge, technology, technological innovations, politics and power. Gender roles and the influence of western science. Both historical and comparative aspects are included. Course is also available online. ***Prerequisites: Graduate standing or permission of instructor. Recommended: PS F101.*** Cross-listed with PS F656. Stacked with PS F456. (3+0)

NORS F658 Comparative Environmental Politics
3 Credits
Enduring issues of the field of comparative politics and their relation to global environmental problems. Biodiversity, transboundary pollution capacity, political processes and organizations, and international commitments all potentially shape the nature and dynamics of global environmental politics and vice versa. Course is also available online. ***Prerequisites: Graduate standing or permission of instructor. Recommended: PS F201 or equivalent comparative politics course.*** Cross-listed with PS F658. Stacked with PS F458. (3+0)

NORS F660 Government and Politics of Canada
3 Credits Offered Spring Odd-numbered Years
The Canadian political system, covering the Canadian constitution, federal structure, parliamentary government and public policy, as well as contemporary issues concerning Native rights and the Canadian North. Students will complete a major research paper on specific policy areas. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with PS F660. Stacked with PS F460. (3+0)

NORS F661 History of Alaska
3 Credits Offered Fall
Alaska from prehistoric times to the present, including major themes such as Native Alaska, colonial and military Alaska, statehood, Alaska Native Claims Settlement Act of 1971 and the Alaska National Interest Lands Act of 1980. Also available through the Center for Distance Education. Cross-listed with HIST F662. Stacked with HIST F461. (3+0)

NORS F662 Alaska Government and Politics
3 Credits Offered Spring Odd-numbered Years
Alaska's government and politics, in the context of American state and local government, and politics and governments of circumpolar northern nations. Topics include political history, constitution, political parties, interest groups, elections, public opinion, governor, legislature, judiciary, administration and local governments. Compares Alaska to the contiguous 48 states and subnational governments of the circumpolar North; examines how government institutions and processes respond to social, environmental and political changes of northern communities. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with PS F662. Stacked with PS F462. (3+0)

NORS F663 Foundation of Russian History
3 Credits Offered Fall Even-numbered Years
The foundations of Russian society and the modern Russian state from the earliest recorded events through the early 19th century. Topics include the Scythians and Khazars, the rise of the Kievan state, Mongol domination of Russia, the rise of Muscovy, the creation of the Russian Empire under the Romanov dynasty, ethnic and social diversity, the impact of the Napoleonic invasion and the influence of western European ideas in Russia. ***Prerequisites: HIST F275; or permission of instructor.*** Cross-listed with HIST F663. Stacked with HIST F463. (3+0)

NORS F664 Modern Russia
3 Credits Offered Fall Even-numbered Years
Russia from the early 19th century to the present. Themes include politics, culture and society in the Russian Empire, the Russian Revolution, the Soviet Union and the Russian Federation. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with HIST F664. Stacked with HIST F464. (3+0)

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NORS F668 **Government and Politics of Russia**
3 Credits Offered Spring Odd-numbered Years
Current developments in Russia from a number of perspectives. The effect of history and geography on political change; the nature of Russian government and society; the legacies of Lenin, Stalin, Gorbachev, and the ideological nature of regimes and leadership. Economic forces and the political struggle in governance; revolution, democracy and reform; and the international role of Russia, particularly in relation to the former Soviet republics, Eastern Europe and other border areas. ***Prerequisites: PS F201; graduate standing or permission of instructor.*** Cross-listed with PS F668. Stacked with PS F468. (3+0)

NORS F670 **Oral Sources; Issues in Documentation**
3 Credits Offered Fall
Preparation for recording and use of oral resources. Examines how meaning is conveyed through oral traditions and personal narratives and the issues involved with recording and reproducing narratives. Includes management of oral recordings, ethical and legal considerations, issues of interpretation and censorship, and the use of new technologies to access and deliver recordings. ***Prerequisites: At least one undergraduate ANTH course and one undergraduate HIST course, or permission of instructor.*** Cross-listed with ANTH F670. Stacked with ANTH F470; NORS F470. (3+0)

NORS F672 **Culture and History in the North Atlantic**
3 Credits Offered Spring Odd-numbered Years
Ancient Norse culture and society. Includes readings of Old Norse poetry and Icelandic sagas in translation, with secondary analyses and archaeological background. Includes Greenlandic myths and contemporary ethnographic accounts of Iceland, Greenland and the Faroe Islands. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with ANTH F672. Stacked with ANTH F472. (3+0)

NORS F680 **Comparative Education**
3 Credits Offered Fall
Focus on the comparative study and analysis of international systems of public education. National issues to be addressed include social context, gender, ideology, international power, level of development, current issues and problems, and efforts toward reform. National systems to be studied include Japan, the People's Republic of China and a variety of other national or cross-national studies to be completed by course participants. Cross-listed with ED F680. (3+0)

NORS F681 **Polar Exploration and its Literature**
3 Credits Offered Spring Odd-numbered Years
A survey of polar exploration efforts of all Western nations from A.D. 870 to the present and a consideration of the historical sources of this effort. Also available through the Center for Distance Education. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with HIST F681. Stacked-with: HIST F481. (3+0)

NORS F683 **20th Century Circumpolar History**
3 Credits Offered Spring Even-numbered Years
A comparative history of the circumpolar North, including Alaska, Siberia, Scandinavia, Greenland and Canada. Focus on social, economic, political and environmental issues of the 20th century, such as exploration, aboriginal land claims, subsistence, military strategy, transportation, oil development, Arctic haze and scientific research in the Arctic. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with HIST F683. Stacked-with: HIST F483. (3+0)

NORS F687 **Alaska Research Resources**
2 Credits Offered Spring
Find, use and evaluate primary sources in the Alaska and Polar Regions Department of the Rasmuson library over the Internet. Student pursues own topics and findings may be used to support research in other courses. Stacked with LS F487. (2+0)

NORS F690 **Researching and Writing Northern History**
3 Credits Offered Spring Odd-numbered Years
Exploration of the craft and methodology of historical research in the North. Course may be repeated for credit when content varies. ***Prerequisites: Graduate standing; or permission of instructor.*** Cross-listed with HIST F690. Stacked with HIST F490. (1+3)

OCCUPATIONAL SAFETY AND HEALTH

A per semester fee for upgrade of equipment, instructional aids and supplies will be assessed for one or more OSH classes.

OSH F108 **Injury Prevention and Risk Management**
4 Credits Offered Fall
Course identifies safety, health management and incident prevention in the workplace. Emphasis on materials handling, electrical and machine safety, first response to fire and medical emergencies, safety and health hazards, and accident prevention. Special fees apply. (3+2)

OSH F110 **Program Assessments, Development and Implementation**
4 Credits Offered Fall
Examines the role of a safety program in the workplace. Emphasis on program assessment, design, development, implementation and evaluation of safety programs. Special fees apply. (4+0)

OSH F120 **Safety Program Management and Recordkeeping**
3 Credits Offered Spring
The role of safety in the business community. Emphasis on philosophy of safety and health efforts by management. Examines the role of the safety manager and the types of and need for accurate recordkeeping. Special fees apply. ***Prerequisites: OSH F110.*** (3+0)

OSH F180 **Introduction to Industrial Hygiene**
4 Credits Offered Spring
Acute and chronic health effects of exposures to chemical, physical and biological agents in the workplace. Emphasizes types of exposure and biological effects, exposure guidelines and basic workplace monitoring. Special fees apply. ***Prerequisites: PRT F110.*** (3+2)

OSH F201 **Workplace Injury and Incident Evaluations**
4 Credits Offered Spring
Assessing and evaluating workplace hazards. Investigation of worker complaints and actual health and safety incidents. Includes practical applications and basic accident investigation case studies. Special fees apply. ***Prerequisites: OSH F108.*** (4+0)

OSH F250 **Hazardous Material Operation**
3 Credits Offered Spring
Identifies the policies, procedures and equipment needed to deal with hazardous materials. Emphasizes the types of hazards, planning, organization and training needed to work safely with hazardous materials. Special fees apply. ***Prerequisites: OSH F180.*** (2+2)

PARALEGAL STUDIES

PLS F102 **Introduction to the Law**
3 Credits
Sources of law in the American tripartite system of government, with emphasis on state and federal court systems. Substantive law is studied, including administrative law, business organization, civil procedure, contract, criminal, employment, family, probate, real estate and tort law. Introductory instruction in legal writing and legal research using the law library and Westlaw. (3+0)

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PLS F103 Introduction to Paralegal Skills
3 Credits
Introduction to the skills required of a paralegal in the job market, including drafting legal documents, pleadings and office correspondence, fact gathering through interviewing and investigating, use of the Internet for legal research, pretrial procedures, focusing primarily on civil rules 30, 33, 34, 35 and 36, and assisting at trial. (3+0)

PLS F105 Introduction to Paralegal Ethics
2 Credits
Introduction to the ethical obligations owed by both lawyers and paralegals to their clients, other lawyers, the court systems where they work and the general public. Alaska Rules of Professional Conduct and the canons of ethics promulgated by the two nationwide paralegal associations. (2+0)

PLS F203 Torts
3 Credits Offered Spring
Study of the essentials needed to effectively assist an attorney in the filing or defense of claims based on personal injury and property damage. A basic vocabulary of legal terminology associated with tort law is studied together with important statutes and case law. Emphasis on Alaska law. ***Prerequisites: PLS F102; PLS F103; PLS F105; or permission of instructor.*** (3+0)

PLS F210 Civil Procedure
3 Credits Offered Fall
Basic vocabulary and concepts essential to effectively assist an attorney with the procedural aspects of civil litigations. ***Prerequisites: PLS F102; PLS F103; PLS F105; or permission of instructor.*** (3+0)

PLS F213 Criminal Law for Paralegals
3 Credits Offered Spring
Study of both the substantive criminal law and the rudiments of criminal procedure, focusing on both Alaska law and procedure and important constitutional considerations associated with due process, search and seizure and Fifth Amendment rights. Learn and work with a basic vocabulary unique to criminal law and procedure. Note: Does not substitute for JUST F352. ***Prerequisites: PLS F102; PLS F103; PLS F105; or permission of instructor.*** (3+0)

PLS F215 Contracts/Real Property
3 Credits Offered Fall
Basic vocabulary and concepts essential to effectively assist an attorney with the preparation of contracts and real property transactions. ***Prerequisites: PLS F102; PLS F103; PLS F105; or permission of instructor.*** (3+0)

PLS F240 Family Law
3 Credits Offered Spring
Basic vocabulary and concepts essential to understanding family law and assisting a practicing attorney. ***Prerequisites: PLS F102; PLS F103; PLS F105; or permission of instructor.*** (3+0)

PLS F242 Employment and Administrative Law
3 Credits Offered Spring
Legal principles which define the relationship between employers and employees. Includes obligations imposed by Federal and Alaska state statutes and administrative regulations. Includes how administrative agencies are created and how they provide administrative law through promulgation of rules and regulations and through quasi-judicial decisions. ***Prerequisites: PLS F102; PLS F103; PLS F105; or permission of instructor.*** (3+0)

PLS F250 Probate Law
3 Credits Offered Fall
Basics of probate law and the uniform probate code. Includes the preparation and interpretation of wills, administration of decedent's estates, intestate succession laws, guardianships and other related probate matters. Focus on Alaska statutes and probate rules. ***Prerequisites: PLS F102; PLS F103; PLS F105; or permission of instructor.*** (3+0)

PLS F260 Computers in the Law Office
3 Credits Offered Spring
Introduction to the role of computers in the law office. Includes hardware and software. Use of word processors, spreadsheets, databases, computer-assisted legal research, the Internet and electronic mail, and litigation support, case management and bookkeeping/billing software. ***Prerequisites: PLS F102; PLS F103; PLS F105; CIOS F150; or permission of instructor.*** (3+0)

PLS F275 Business Organizations
3 Credits Offered Fall
Benefits and shortcomings of the three basic business forms: corporation, partnership, and sole proprietorship. How to form each business form, how to operate it according to relevant laws and regulations, and how to dissolve the business. ***Prerequisites: PLS F102; PLS F103; PLS F105; or permission of instructor.*** (3+0)

PLS F280 Legal Research and Writing for Paralegals
3 Credits Offered Spring
Legal research skills using law library methods, LexisNexis and the Internet. Read and understand authorities from three branches of government: executive, legislative and judicial. Emphasis on precedent from Alaska and federal court systems. Includes writing skills from drafting of law office correspondence to preparation of court pleadings and briefs. (3+0)

PLS F285 Advanced Legal Writing
2 Credits Offered Spring
Expand on writing skills previously learned by drafting documents regularly assigned to practicing paralegals. For example, pleadings to be filed in court, legal documents, such as contracts, wills and those used by business organizations, office correspondence, deposition summaries and interoffice legal memorandums. ***Prerequisites: PLS F102; PLS F103; PLS F105; PLS F280.*** (2+0)

PLS F299 Paralegal Studies Internship
3 Credits
An internship involving a minimum of 150 hours of work under the supervision of an attorney, and, when available, a practicing paralegal for that attorney in a local law office or law-related situation. Must seek approval of faculty advisor for admittance. Note: Students meet as a class only once. All subsequent classes or meetings with UAF faculty advisor are arranged by individual student(s) and advisor. ***Prerequisites: Must have completed at least 75% of paralegal studies degree requirements with a minimum 2.8 cumulative GPA or approval of UAF faculty advisor.*** (3+0)

PETROLEUM ENGINEERING

A per semester student computing facility user fee is assessed for CEM engineering courses. This fee is in addition to any lab/material fees.

PETE F103 Survey of the Energy Industries
1 Credit Offered Fall
Overview of global energy supply and demand, alternate energy options, Alaska alternate energy resources and impact on the state economy. (1+0)

PETE F104 Fundamentals of Petroleum
1 Credit Offered Spring
Fundamental principles on the origin, migration, accumulation and exploration of petroleum. Influence of rock and fluid properties on the principles of petroleum recovery. (1+0)

PETE F205 Fundamentals of Drilling Practices
1 Credit Offered Fall
Fundamental principles of drilling, drilling practices, drilling fluids and drilling problems dependent on mud control. ***Prerequisites: PETE F104 or permission of instructor.*** (1+0)

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PETE F206 **Introduction to Petroleum Production**
1 Credit Offered Spring
Overview of production practices, surface production equipment, special production problems and workover and petroleum transportation. ***Prerequisite: PETE F205 or permission of instructor.*** (1+0)

PETE F211 **Drilling Laboratory**
1-2 Credits Offered Spring
Measurement of physical properties of drilling mud. Optional BOP certification and drilling rig operation experience during spring break. ***Prerequisites: PETE F205 or permission of instructor.*** (0+3 or 6)

PETE F301 **Reservoir Rock and Fluid Properties**
4 Credits Offered Fall
Fundamental concepts of reservoir rock and fluid properties including porosity, permeability, fluid saturations, capillary pressure, relative permeabilities, classification of petroleum reservoirs by fluid phase contents, oil, gas and water properties, fluid sampling, and PVT analysis. ***Prerequisites: MATH F201X; ES F346; GEOS F101X or GE F261.*** (4+0)

PETE F302 **Well Logging**
3 Credits Offered Spring
Comprehensive treatment of modern well logging methods including formation and production logging tools, and techniques and basic concepts of log interpretation. ***Prerequisites: PETE F205; junior standing in engineering or geoscience; or permission of instructor.*** (3+0)

PETE F303 W **Reservoir Rock and Fluid Properties Laboratory**
1 Credit Offered Spring
Measurement of properties of reservoir rock and reservoir fluids. Determination of porosity, permeability, fluid saturations, capillary pressures, specific gravity density, viscosity, surface tension, PVT properties and interpretation of PVT reports for reservoir fluid samples. Special fees apply. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; PETE F301.*** (0+3)

PETE F370 **Sedimentology and Structural Geology for Petroleum Engineers** (n)
4 Credits Offered Fall Odd-numbered Years
Origin and distribution of sedimentary rocks including depositional environments, stratigraphic relationships and structures. Emphasis on the relationship to petroleum occurrences and petroleum exploration. Laboratory exercises on mapping, structural problems and facies relationships in petroleum exploration. ***Prerequisites: GEOS F101X or GE F261.*** Cross-listed with GEOS F370. (3+3)

PETE F407 **Petroleum Production Engineering**
3 Credits Offered Fall
Production system analysis, inflow performance analysis, gas lift design, sucker rod pumping and production decline analysis. ***Prerequisites: ES F341 and ES F346.*** (3+0)

PETE F411 W **Drilling Fluids Laboratory**
1 Credit Offered Spring
Design, composition and measurement of drilling fluid properties, evaluation of mud activities and chemical treatment of contaminated drilling fluid. Special fees apply. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; PETE F205; concurrent enrollment in PETE F426.*** (0+3)

PETE F421 **Reservoir Characterization**
3 Credits Offered Spring
Reservoir rock properties and their spatial variations; estimation of reserves; introduction to theory and application of geostatistics to reservoir characterization; presentation of fundamental geostatistical concepts including: variogram analysis, estimation variance, kriging and stochastic simulations. Impact of geologic structure on oil recovery methods. ***Prerequisites: PETE F301; PETE F302; GEOS F370.*** Stacked with PETE F621. (3+0)

PETE F426 **Drilling Engineering**
3 Credits Offered Spring
Principles of drilling, drilling fluids and rheology, drilling problems, drilling hydraulics, well control techniques and casing seat selection. ***Prerequisites: ES F331; ES F341.*** (3+0)

PETE F431 **Natural Gas Engineering**
2 Credits Offered Fall
Natural gas production and condensate reservoirs. Design of processing, transportation, distribution and flow measurement systems. ***Prerequisites: PETE F301.*** (2+0)

PETE F456 **Petroleum Evaluation and Economic Decisions**
3 Credits Offered Spring
Economic appraisal methods for oil field developmental project evaluations including risk analysis, probability and statistics in decision making and evaluations. Case studies. ***Prerequisites: MATH F202X and PETE F476.*** (3+0)

PETE F458 **Petroleum Engineering Internship**
1 Credit Offered as Demand Warrants
Practical experience in a supervised petroleum engineering environment. Participation in professional petroleum operations including drilling, production, formation evaluation, reservoir engineering, petroleum property evaluation, management and economics. Written and oral presentation of technical report describing experience is required. Course may be repeated for up to 4 credits. ***Prerequisites: Junior standing or permission of instructor.*** (0+0)

PETE F466 **Petroleum Recovery Methods**
3 Credits Offered Fall
Flow and physicochemical principles of oil recovery by water, chemical, thermal and miscible floods. Prediction of recovery for each of these methods. ***Prerequisites: PETE F301 and PETE F476.*** (3+0)

PETE F476 **Petroleum Reservoir Engineering**
3 Credits Offered Spring
Quantitative study and prediction of the behavior of oil and gas reservoirs under primary, secondary and tertiary recovery mechanisms. ***Prerequisites: PETE F301.*** (3+0)

PETE F478 **Well Test Analysis**
2 Credits Offered Spring
Transient flow of fluids through porous media, application of solutions of the diffusivity equation to pressure buildup, drawdown, interference testing and log-log type curve analysis and effect of reservoir heterogeneities on pressure behavior. ***Prerequisites: PETE F407; PETE F476; MATH F302.*** (2+0)

PETE F481 W **Well Completions and Stimulation Design**
3 Credits Offered Fall
Design of casing programs, cementing, open-hole and set-through completions, well stimulation; completion and workover fluids; and evaluation of sand control and workover operations. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; ES F341; PETE F205; PETE F426.*** (2+3)

PETE F487A **Petroleum Project Design**
1 Credit Offered Fall
Two-semester course with emphasis on design and analysis of petroleum exploration, production and reservoir engineering systems by analytical, experimental and computer methods. Identification of requirements, conceptual and detailed project design and cost analysis. Completion of an engineering project. Note: Oral communication intensive and writing intensive credits are earned upon successful completion of PETE F487B. Special fees apply. ***Prerequisites: Senior standing.*** (2+0)

PETE F487B W,O **Petroleum Project Design**
1 Credit Offered Spring
Two-semester course with emphasis on design and analysis of petroleum exploration, production and reservoir engineering systems by analytical,

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experimental and computer methods. Identification of requirements, conceptual and detailed project design and cost analysis. Completion of an engineering project. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; senior standing.*** (2+0)

PETE F489 Reservoir Simulation
2 Credits Offered Spring
The theory and use of computer reservoir simulation in petroleum reservoir and production engineering. Special fees apply. ***Prerequisites: PETE F476; MATH F310 or ES F301.*** (2+0)

PETE F607 Advanced Production Engineering
3 Credits Offered as Demand Warrants
Production system analysis, production optimization, downhole equipment design, surface facilities design, oil and gas processing, gas and oil treating systems, disposal well systems, project organization and field development. Special fees apply. ***Prerequisites: Graduate standing, PETE F407 or equivalent; or permission of instructor.*** (3+0)

PETE F610 Advanced Reservoir Engineering
3 Credits Offered as Demand Warrants
Concepts and tools for solving petroleum reservoir engineering problems; advances in petroleum reservoir engineering. Emphasis on material balance methods and their application to estimate reserves and calculate water influx; diversity equations and solutions; gas and water coning; streamline tracking; and decline curve analysis, productivity index and well performance models for vertical, horizontal and multilateral wells. Special fees apply. ***Prerequisites: PETE F476 or permission of instructor.*** (3+0)

PETE F621 Applied Reservoir Characterization
3 Credits Offered as Demand Warrants
Review of reservoir rock properties and their spatial variations; estimation of reserves; introduction to theory and application of geostatistics to reservoir characterization; presentation of fundamental geostatistical concepts including: variogram analysis, estimation variance, kriging and stochastic simulations. Impact of geologic structure on oil recovery. Use of computer software for reservoir characterization and class project. Special fees apply. ***Prerequisites: Graduate standing in Petroleum Engineering; or permission of instructor.*** Stacked with PETE F421. (3+0)

PETE F630 Water Flooding
3 Credits Offered as Demand Warrants
A study of the fundamental concepts and procedures for the design of waterflooding processes in petroleum reservoirs. Special fees apply. ***Prerequisites: PETE F301; PETE F476; or permission of instructor.*** (3+0)

PETE F656 Advanced Petroleum Economic Analysis
3 Credits Offered as Demand Warrants
Economic analysis of petroleum production leading towards increasing cost efficiency in the petroleum and related industries. Qualitative and quantitative description of production forecasts and reserve estimation; oil and gas pricing; cash flow analysis; risk and uncertainty of operation of oil and gas production (financing, debt/equity ratio, depreciation and taxation). Special fees apply. ***Prerequisites: PETE F407, PETE F456; or permission of instructor.*** (3+0)

PETE F661 Applied Well Testing
3 Credits Offered as Demand Warrants
Equations for transient flow of single phase fluids through porous media, extension to sample multiphase flow, isolated and developed multi-well flow, conventional drawdown and buildup analysis, log-log type curve analysis, interference testing, fractured wells, pulse tests, and drill stem tests. Special fees apply. ***Prerequisites: PETE F476; PETE F610; or permission of instructor.*** (3+0)

PETE F662 Enhanced Oil Recovery
3 Credits Offered as Demand Warrants
Secondary and tertiary oil recovery processes, including waterflooding and chemical and thermal recovery methods. Special fees apply. ***Prerequisites: PETE F476 or PETE F610 or permission of instructor.*** (3+0)

PETE F663 Applied Reservoir Simulation
3 Credits Offered as Demand Warrants
Mathematical description of the reservoir, organization of reservoir simulation study, history matching and prediction for several published case studies of reservoir simulations. Special fees apply. ***Prerequisites: Reservoir Engineering course - e.g. PETE F476 or PETE F610 or permission of instructor.*** (3+0)

PETE F665 Advanced Phase Behavior
3 Credits Offered as Demand Warrants
The development and application of phase equilibrium simulators to predict fluid properties for reservoir fluids. Special fees apply. ***Prerequisites: PETE F301 or permission of instructor.*** (3+0)

PETE F666 Drilling Optimization
3 Credits Offered as Demand Warrants
Principles of drilling optimization: drilling cost analysis and control; rheological properties of drilling fluid for optimum hole cleaning; planning an optimum mud program for vertical, directional and horizontal wellbores; optimizing bit hydraulics. Use of software packages in optimized hydraulics. Special fees apply. ***Prerequisites: Graduate standing in engineering discipline or permission of instructor.*** (3+0)

PETE F670 Fluid Flow Through Porous Media
3 Credits Offered as Demand Warrants
The study of transport phenomena in porous media and application to petroleum engineering. Special fees apply. ***Prerequisites: PETE F301; PETE F476; or permission of instructor.*** (3+0)

PETE F680 Horizontal Well Technology
3 Credits Offered as Demand Warrants
Review of the state of the art of horizontal well technology covering recent advances in drilling and completion of horizontal wells. Emphasis on field practices, reservoir engineering aspects including well testing and well performance estimation, application of horizontal wells to gas and water coning problems as well as enhanced oil recovery. Special fees apply. ***Prerequisites: PETE F426; PETE F476; or permission of instructor.*** (3+0)

PETE F683 Natural Gas Processing and Engineering
3 Credits Offered as Demand Warrants
Natural gas reservoir engineering and gas production practices. Transient flow of real gases, gas field development, gas well testing, transportation and gas storage reservoirs. Special fees apply. ***Prerequisites: PETE F431; PETE F476; or permission of instructor.*** (3+0)

PETE F685 Non-Newtonian Fluid Mechanics
3 Credits Offered as Demand Warrants
Characteristics of stress in fluids, flow models of non-Newtonian fluids (Bingham plastic fluids, fluids without yield stress), couette flow analysis of non-Newtonian fluids, surge and swab pressure models for plugged and open-end pipes. Special fees apply. ***Prerequisites: ES F341; PETE F426 or permission of instructor.*** (3+0)

PETE F689 Multiphase Fluid Flow in Pipes
3 Credits Offered as Demand Warrants
Multiphase flow in pipes, modeling of fluid flow of complex mixtures in pipes, empirical correlations developed in the literature, and calculation of pressure gradients and flow rates during the flow of multiphase fluids through vertical, inclined and horizontal pipes. Special fees apply. ***Prerequisites: ES F341; MATH F310 or ES F301; PETE F407; or permission of instructor.*** (3+0)

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PHILOSOPHY

PHIL F102 **Introduction to Philosophy** (h)
3 Credits
Survey of philosophers and problems in the Western tradition beginning with the ancient Greeks (Plato, Aristotle) and continuing with medieval (Anselm, Augustine, Aquinas) and modern European thinkers (Descartes, Hume, Kant, Nietzsche). Themes and topics may vary. (3+0)

PHIL F104 **Logic and Reasoning** (h)
3 Credits Offered Fall
Principles of deductive and inductive logic and application of the principles to critical thinking in logic and its application. (3+0)

PHIL F108 **Science, Critical Thinking and Pseudoscience** (h)
3 Credits Offered Spring Odd-numbered Years
Examines the difference between science and pseudoscience, making use of the tools of critical thinking to understand what counts as knowledge. Examples are drawn from evolutionary theory, creationism, astronomy, astrology, history, race theory and Holocaust revisionism. ***Prerequisites: PHIL F102 or permission of instructor.*** (3+0)

PHIL F110 **Introduction to Political Philosophy** (h)
3 Credits Offered Fall Odd-numbered Years
Introduction to historical and contemporary issues in political thought. Topics and themes vary, but include questions such as: Should we consent to be governed? What is civil society? What does it mean to be a citizen? What are the basic forms of government? (3+0)

PHIL F202 **Introduction to Eastern Philosophy** (h)
3 Credits Offered Spring
Basic assumptions, problems and systems of the major philosophical traditions of the Far East. ***Prerequisites: PHIL F102 or permission of instructor.*** (3+0)

PHIL F322X **Ethics** (h)
3 Credits
"Ethic," — from the Greek "ethos" meaning character, custom, usage — is the study of value distinctions. Examination of the nature of value judgments — their historical origins and philosophical assumptions — and exploration of the application of value distinctions to contemporary social, religious and scientific/technical issues. Also available through the Center for Distance Education. ***Prerequisites: Placement in ENGL F111X or higher; junior standing; or permission of instructor. Recommended but not required: Two courses in the Perspectives on the Human Condition baccalaureate core.*** (3+0)

PHIL F341 O **Theories of Knowledge** (h)
3 Credits Offered Fall Even-numbered Years
The nature of knowledge, truth and certainty. ***Prerequisites: COMM F131X or COMM F141X; PHIL F102.*** (3+0)

PHIL F342 **Theories of Reality** (h)
3 Credits Offered Spring Even-numbered Years
Theories of reality and their relationship to science, philosophy and religion. ***Prerequisites: PHIL F102.*** (3+0)

PHIL F351 **History of Ancient Greek Philosophy** (h)
3 Credits Offered Fall
Review of the philosophy of Plato and Aristotle; minor attention to Presocratics. ***Prerequisites: PHIL F102 or its equivalent.*** (3+0)

PHIL F352 **History of Modern Philosophy: Descartes to Kant** (h)
3 Credits Offered Spring
Review of continental rationalist and British empiricist thought, 17th - 19th centuries. ***Prerequisites: PHIL F102 or its equivalent. Recommended: PHIL F351 strongly recommended.*** (3+0)

PHIL F353 **Survey of Buddhist Thought** (h)
3 Credits
Survey of the major themes and schools of Buddhist thought. Emphasis on the interactions with surrounding cultures and competing philosophical systems. Includes modern developments in India, China, Japan, Tibet and other parts of Asia. ***Prerequisites: Upper class standing or permission of instructor.*** (3+0)

PHIL F361 **Philosophy in Literature** (h)
3 Credits Offered as Demand Warrants
Examination of philosophical issues in literary works. Topics include the nature of free will, the effects of choice in building a character, the desirable (and undesirable) ways of confronting morality, and the nature of evil. Topics and readings vary. (3+0)

PHIL F362 **Feminist Philosophy** (h)
3 Credits Offered as Demand Warrants
Examination of contemporary feminist philosophical positions. Emphasis on feminist ethics, social and political philosophy, and epistemology. Cross-listed with WMS F362. (3+0)

PHIL F363 W **Philosophy of Religion** (h)
3 Credits Offered as Demand Warrants
Introduction to topics such as arguments for the existence and nature of God, the problem of evil, the relation of faith and reason, religious language and the connection of religion to the meaning of life. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor. Recommended: PHIL F102 and upper-division status.*** (3+0)

PHIL F402 W **Biomedical and Research Ethics** (h)
3 Credits Offered Fall
Issues in biomedical ethics. Topics will vary but include discussion of moral principles and problems of research ethics and medical ethics, such as: animal and human experimentation; data management; informed consent; therapeutic and non-therapeutic research; physician/patient relationship; autonomy; assisted reproductive technologies; euthanasia; organ transplantation; and allocation of scarce medical resources. ***Prerequisites: ENGL F111X; either ENGL F211X or ENGL F213X; junior or senior standing; a course in philosophy, science, or nursing; permission of instructor. Recommended: A course in philosophy, science or nursing.*** Cross-listed with BIOL F402. (3+0)

PHIL F411 W,O **Classical Political Theory** (h)
3 Credits Offered Fall Odd-numbered Years
Political ideas from ancient Greece, Rome, and the Judaeo-Christian tradition. Theories of Plato, Aristotle, Cicero, Augustine and Aquinas. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; PHIL F102; PS F101; or permission of instructor.*** Cross-listed with PS F411. (3+0)

PHIL F412 W **Modern Political Theory** (s)
3 Credits Offered Spring Even-numbered Years
Political ideas from the Renaissance to the modern world. Theories of Machiavelli, Hobbes, Locke, Rousseau, Burke, Marx and Lenin. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL 213X; PHIL F102; PS F101; or permission of instructor.*** Cross-listed with PS F412. (3+0)

PHIL F421 **Aesthetics** (h)
3 Credits Offered Fall Odd-numbered Years
The nature of aesthetic experience in poetry, music, painting, sculpture, architecture and other arts; studies in relation to artistic production and the role of art in society. ***Prerequisites: Junior/senior standing or permission of instructor. Recommended: PHIL F102 or HUM F201X.*** (3+0)

PHIL F471 **Contemporary Philosophical Problems** (h)
3 Credits Offered Fall Even-numbered Years
Ideological issues facing the modern world. ***Prerequisites: PHIL F351; PHIL F352; or permission of instructor.*** (3+0)

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PHIL F472 **Ethics in International Affairs** (h)
3 Credits Offered Spring Odd-numbered Years
Examination of questions including: What is in the interest of the nation-state according to the logic of statecraft? How does the national interest relate to broader human interest? How does morality relate to the international legal order? Examination is through theory and case studies. ***Prerequisites: PHIL F322X or equivalent or PS F321; or permission of instructor.*** Cross-listed with PS F472. (3+0)

PHIL F481 **Philosophy of Science** (h)
3 Credits Offered as Demand Warrants
Comparison and discussion of various contemporary methodological positions. ***Prerequisites: Junior standing.*** (3+0)

PHIL F482 **Comparative Philosophy and Religions** (h)
3 Credits Offered as Demand Warrants
Review of non-western philosophical thought, e.g., African, Jewish, Latin American, Oriental and others. (3+0)

PHIL F487 **Conceptual Issues in Evolutionary Biology**
3 Credits Offered Spring Odd-numbered Years
Analysis of some of the main models which explain evolutionary change, followed by consideration of the practical implications these models have on the study of biological phenomena in general. Cross-listed with BIOL F487. Stacked with BIOL F687; PHIL F687. (3+0)

PHIL F499 W **B.A. Thesis in Philosophy** (h)
3 Credits Offered as Demand Warrants
Writing the senior thesis in philosophy. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** (1+2)

PHIL F687 **Conceptual Issues in Evolutionary Biology**
3 Credits Offered Spring Odd-numbered Years
Analysis of some of the main models which explain evolutionary change, followed by consideration of the practical implications these models have on the study of biological phenomena in general. Cross-listed with BIOL F687. Stacked with BIOL F487; PHIL F487. (3+0)

PHYSICS

PHYS F102X **Energy and Society** (n)
4 Credits Offered Spring
Exploring the concept of energy. Investigation of the sources, conversion, distribution and ultimate dispersion of energy, as well as the consequences of its use in the development and maintenance of modern society. May be used to fulfill part of the natural science requirement. Designed for non-science majors. Special fees apply. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+3)

PHYS F103X **College Physics** (n)
4 Credits Offered Fall
Classical physics including vectors, kinematics, Newton's Laws, momentum, work, energy, rotational motion, oscillations, waves, gravity, fluids, heat, temperature, laws of thermodynamics and kinetic theory. For mathematics, science and liberal arts majors. Special fees apply. ***Prerequisites: High school algebra, trigonometry and geometry; placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+3)

PHYS F104X **College Physics** (n)
4 Credits Offered Spring
Coulomb's Law, electrical potential, capacitance, Kirchoff's Laws, magnetic fields, Faraday's Law, electromagnetic waves, physical and geometrical optics, waves and particles, atomic and nuclear physics. For mathematics, science and liberal arts majors. Special fees apply. ***Prerequisites: PHYS F103X; placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.*** (3+3)

PHYS F115X **Physical Science I** (n)
4 Credits Offered Fall
Basic concepts and general overview in physics. Presents interrelatedness and interdependence within this scientific field. Special fees apply. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor. Recommended: DEVM F105.*** (3+3)

PHYS F116X **Physical Science II** (n)
4 Credits Offered Spring
Basic concepts and general overview in chemistry, astronomy, meteorology and geology. Presents interrelatedness and interdependence of these scientific fields. Special fees apply. ***Prerequisites: Placement in ENGL F111X or higher; placement in DEVM F105 or higher. Recommended: PHYS F115X; DEVM F105.*** (3+3)

PHYS F175X **Introduction to Astronomy** (n)
4 Credits Offered Fall
Examination of the science of astronomy and its social consequences, with an emphasis on the interrelationships between astronomy and other sciences. Topics covered: astronomical concepts and tools, the solar system, stellar astronomy and cosmology. Designed for non-science majors. Special fees apply. ***Prerequisites: DEVM F105; ENGL F111X; or appropriate placement scores.*** (3+3)

PHYS F211X **General Physics** (n)
4 Credits
Vectors, kinematics, Newton's Laws, momentum, work, energy, rotational motion, oscillations, waves, gravity and fluids. For engineering, mathematics and physical science majors. Special fees apply. ***Prerequisites: Concurrent enrollment in MATH F201X; placement in ENGL F111X or higher; or permission of instructor. Recommended: One year of high school physics.*** (3+3)

PHYS F212X **General Physics** (n)
4 Credits
Heat, temperature, laws of thermodynamics, Coulomb's Law, electrical potential, capacitance, Kirchoff's Laws, Biot-Savart Law, Faraday's Law, and electromagnetic waves. For engineering, mathematics and physical science majors. Special fees apply. ***Prerequisites: Concurrent enrollment in MATH F202X; PHYS F211X or ES F208 or concurrent enrollment in ES F210; placement in ENGL F111X or higher; or permission of instructor.*** (3+3)

PHYS F213X **Elementary Modern Physics** (n)
4 Credits Offered Fall
Geometrical and physical optics, elementary-level modern physics including special relativity, atomic physics, nuclear physics, solid-state physics, elementary particles, simple transport theory, kinetic theory and concepts of wave mechanics. Special fees apply. ***Prerequisites: Placement in ENGL F111X or higher; C or better in MATH F201X and MATH F202X; PHYS F211X; PHYS F212X; or permission of instructor.*** (3+3)

PHYS F220 **Introduction to Computational Physics**
4 Credits Offered Spring
Introduction to computational techniques for solving physics problems. The computer is used as a tool to provide insight into physical systems and their behavior in all areas of physics. ***Prerequisites: MATH F202X; PHYS F211X; PHYS F212X; PHYS F213X; or permission of instructor.*** (3+3)

PHYS F301 **Introduction to Mathematical Physics**
4 Credits Offered Spring
Introduction to theoretical foundations of classical and modern physics. Includes calculus of vector fields, linear algebra and elementary tensor theory, complex analysis, ordinary linear differential equations, linear partial differential equations, Fourier analysis and probability. Physical applications include planetary motion, rotating bodies and inertia tensor, damped and driven harmonic oscillator, wave equation, Schrödinger's equation and diffusive systems. ***Prerequisites: PHYS F211X; PHYS F212X; PHYS F213X; MATH F202X; or permission of instructor.*** (4+0)

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PHYS F313 **Thermodynamics and Statistical Physics**
4 Credits Offered Spring
Thermodynamic systems, equations of state, the laws of thermodynamics, changes of phase, thermodynamics of reactions, kinetic theory and introduction to statistical mechanics. ***Prerequisites: PHYS F212X; concurrent enrollment in PHYS F301; or permission of instructor.*** (4+0)

PHYS F341 **Classical Physics I: Particle Mechanics**
4 Credits Offered Fall
Newtonian mechanics, conserved mechanical quantities, motion of systems of particles, rigid body statics and dynamics, moving and accelerated coordinate systems, rigid body rotations and Lagrangian mechanics. ***Prerequisites: PHYS F211X; PHYS F212X; PHYS F220; PHYS F301; or permission of instructor.*** (4+0)

PHYS F342 **Classical Physics II: Electricity and Magnetism**
4 Credits Offered Spring
Statics and dynamics of electric and magnetic fields in vacuum and in the presence of materials. Lorentz force law. Maxwell's equations. ***Prerequisites: PHYS F341 or permission of instructor.*** (4+0)

PHYS F343 **Classical Physics III: Vibration and Waves**
4 Credits Offered Fall
Normal modes and small vibrations, continuum systems, wave mechanics, electromagnetic waves and radiation. Relativistic mechanics and electromagnetism. ***Prerequisites: PHYS F342 or permission of instructor.*** (4+0)

PHYS F381 W,O **Physics Laboratory** (n)
3 Credits Offered Fall
Laboratory experiments in classical and modern physics. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; PHYS F213X; or permission of instructor.*** (1+6)

PHYS F382 W **Physics Laboratory** (n)
3 Credits Offered Spring
Laboratory experiments in classical and modern physics. Special fees apply. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; PHYS F381; or permission of instructor.*** (1+6)

PHYS F421 **Quantum Mechanics**
4 Credits Offered Fall
Schrödinger's equation, Born interpretation, operator formalism, measurement and projection, stationary states, one-dimensional systems, hydrogen atom, states of definite angular momentum, perturbation theory. ***Prerequisites: PHYS F213X; PHYS F220; PHYS F301; or permission of instructor.*** (4+0)

PHYS F462 **Geometrical and Physical Optics** (n)
4 Credits Offered Spring
Geometrical optics, interference and diffraction theory, nonlinear optics, Fourier optics, and coherent wave theory. Special fees apply. ***Prerequisites: PHYS F213X; PHYS F301; or permission of instructor.*** (3+3)

PHYS F471A **Advanced Topics in Physics I: Condensed Matter Physics I**
1 Credit
Emphasis topics provide increased breadth in basic physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F471B **Advanced Topics in Physics I: Condensed Matter Physics II**
1 Credit
Emphasis topics provide increased breadth in basic physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F471C **Advanced Topics in Physics I: Space and Auroral Physics**
1 Credit
Emphasis topics provide increased breadth in basic physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F471D **Advanced Topics in Physics I: Nonlinear Dynamics**
1 Credit
Emphasis topics provide increased breadth in basic physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F471E **Advanced Topics in Physics I: Biophysics**
1 Credit
Emphasis topics provide increased breadth in basic physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F471F **Advanced Topics in Physics I: Nuclear and Particle Physics**
1 Credit
Emphasis topics provide increased breadth in basic physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F471G **Advanced Topics in Physics I: General Relativity**
1 Credit
Emphasis topics provide increased breadth in basic physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F471H **Advanced Topics in Physics I: Astrophysics**
1 Credit
Emphasis topics provide increased breadth in basic physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F471I **Advanced Topics in Physics I: Topics in Modern Mathematical Physics**
1 Credit
Emphasis topics provide increased breadth in basic physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F472A **Advanced Topics in Physics II: Planetary Atmospheres**
1 Credit
Application topics provide expanded exposure to subjects in physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F472B **Advanced Topics in Physics II: Fluid Dynamics**
1 Credit
Application topics provide expanded exposure to subjects in physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

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PHYS F472C Advanced Topics in Physics II: Plasma Physics
1 Credit
Application topics provide expanded exposure to subjects in physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F472D Advanced Topics in Physics II: Hamiltonian Mechanics
1 Credit
Application topics provide expanded exposure to subjects in physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F472E Advanced Topics in Physics II: Physics of Glaciers
1 Credit
Application topics provide expanded exposure to subjects in physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F472F Advanced Topics in Physics II: Remote Sensing
1 Credit
Application topics provide expanded exposure to subjects in physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F472G Advanced Topics in Physics II: Solar Physics
1 Credit
Application topics provide expanded exposure to subjects in physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F472H Advanced Topics in Physics II: Advanced Laboratory
1 Credit
Application topics provide expanded exposure to subjects in physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F472I Advanced Topics in Physics II: Spectroscopy
1 Credit
Application topics provide expanded exposure to subjects in physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F472J Advanced Topics in Physics II: Cosmology
1 Credit
Application topics provide expanded exposure to subjects in physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F472K Advanced Topics in Physics II: Quantum Computation
1 Credit
Application topics provide expanded exposure to subjects in physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F472L Advanced Topics in Physics II: Covariant Kinematics/Dynamics
1 Credit
Application topics provide expanded exposure to subjects in physics. Three topics are offered within the fall and spring semesters of each academic year as compressed 14-lecture, one-credit courses. ***Prerequisites: PHYS F220; PHYS F301; or permission of instructor.*** (1+0)

PHYS F488 Undergraduate Research
1-3 Credits
Advanced research topics from outside the usual undergraduate requirements. ***Prerequisites: Permission of instructor. Recommended: A substantial level of technical/scientific background.*** (0+0)

PHYS F611 Mathematical Physics
3 Credits Offered Fall
Mathematical tools and theory for classical and modern physics. Core topics: linear algebra including eigenvalues, eigenvectors and inner products in finite dimensional spaces. Infinite series. Hilbert spaces and generalized functions. Complex analysis, including Laurent series and contour methods. Applications to problems arising in physics. Selected additional topics, which may include operator and spectral theory, groups, tensor fields and hypercomplex numbers. ***Prerequisites: MATH F302; MATH F314; MATH F421; MATH F422; or permission of instructor.*** Cross-listed with MATH F611. (3+0)

PHYS F612 Mathematical Physics
3 Credits Offered Spring
Continuation of Mathematical Physics I; mathematical tools and theory for classical and modern physics. Core topics: classical solutions to the principal linear partial differential equations of electromagnetism, classical and quantum mechanics. Boundary value problems and Sturm-Liouville theory. Green's functions and eigenfunction expansions. Integral transforms. Orthogonal polynomials and special functions. Applications to problems arising in physics. Selected additional topics, which may include integral equations and Hilbert-Schmidt theory, perturbation methods and probability theory. ***Prerequisites: PHYS/MATH F611 or equivalent; or permission of instructor.*** Cross-listed with MATH F612. (3+0)

PHYS F614 Ice Physics
3 Credits Offered Spring Even-numbered Years
A survey of the physics of ice, including the crystal structure and properties of ice, high pressure phases, hydrogen bonding, mechanical properties, thermal properties, electrical and acoustic properties, nucleation and growth, optical properties and surface properties (adhesion, friction). ***Prerequisites: MATH F421; MATH F422; graduate standing; or permission of instructor.*** Cross-listed with GEOS F614. (3+0)

PHYS F621 Classical Mechanics
3 Credits Offered Fall Odd-numbered Years
Lagrange's equations, two-body problem, rigid body motion, special relativity, canonical equations, transformation theory, and Hamilton-Jacobi method. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

PHYS F622 Statistical Mechanics
3 Credits Offered Spring Even-numbered Years
Classical and quantum statistics of independent particles, ensemble theory and applications. ***Prerequisites: PHYS F621; graduate standing; or permission of instructor.*** (3+0)

PHYS F626 Fundamentals of Plasma Physics
3 Credits Offered Fall
Single charge particle motion in the electromagnetic fields, plasma kinetic theory, Vlasov equations for collisionless plasmas, magnetohydrodynamic equations, linear plasma waves and instabilities, nonlinear plasma waves and instabilities. ***Prerequisites: Graduate standing; or permission of instructor.*** (3+0)

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PHYS F628 **Digital Time Series Analysis**
3 Credits Offered Spring Even-numbered Years
Applied time series analysis, including correlation, convolution, filtering and spectral estimation of multivariate data. The statistical properties of estimators; signal detection; and array processing. ***Prerequisites: MATH F401; MATH F402 or equivalent; familiarity with a programming language such as C or Fortran; graduate standing; or permission of instructor.*** (3+0)

PHYS F629 **Methods of Numerical Simulation in Fluids and Plasma**
3 Credits Offered Spring Odd-numbered Years
The fundamentals of computer simulation for fluids and multi-particle systems. Topics include methods for the discretization of numerical solutions, and boundary and initial conditions. Methods will be applied to convection, diffusion, and steady states in fluids and plasmas. ***Prerequisites: Experience in programming; graduate standing; or permission of instructor.*** (3+0)

PHYS F631 **Electromagnetic Theory**
3 Credits Offered Fall Even-numbered Years
Electrostatics, magnetostatics, Maxwell's equations, and potentials. Lorentz equations, field energy, gauge conditions, retarded potentials, waves, radiation and tensor formulations. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

PHYS F632 **Electromagnetic Theory**
3 Credits Offered Spring Odd-numbered Years
Electrostatics, magnetostatics, Maxwell's equations and potentials. Lorentz equations, field energy, gauge conditions, retarded potentials, waves, radiation and tensor formulations. ***Prerequisites: PHYS F631 or the equivalent; graduate standing; or permission of instructor.*** (3+0)

PHYS F639 **InSar and its Applications**
3 Credits Offered as Demand Warrants
Introduction to the concepts of repeat-pass spaceborne SAR interferometry and practical use of the technique to derive displacements of the solid Earth, glaciers, and ice sheets to a precision of a few centimeters and accurate digital elevation models of the Earth's surface. ***Prerequisites: Basic remote sensing course or permission of instructor.*** Cross-listed with GEOS F639. (2+2)

PHYS F640 **Auroral Physics**
3 Credits Offered Spring Odd-numbered Years
Survey of aurora phenomena, the associated physical processes, and techniques used to investigate the aurora. Includes electron and proton impact spectra; physical processes that accelerate and precipitate electrons and protons; auroral currents; ionospheric effects of auroral activity; and principles for ground-based satellite spectroscopy and imaging and the measurements of magnetic and electric fields. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

PHYS F645 **Fundamentals of Geophysical Fluid Dynamics**
3 Credits Offered Fall Odd-numbered Years
Introduction to the mechanics of fluid systems, the fundamental processes, Navier-Stokes' equations in rotating and stratified fluids, kinematics, conservation laws, vortex motion, irrotational flow, laminar flow, boundary layer phenomena, waves, instabilities, turbulent flows and mixing. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

PHYS F648 **Nonlinear Dynamics**
3 Credits Offered Spring Even-numbered Years
Introduction into the dynamics of nonlinear systems. Continuous and discrete dynamical systems, stability analysis, bifurcations, limit cycle, chaos and strange attractors, fractals and dimension algorithms, controlling chaos, synchronization processes, and stochastic dynamical systems. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

PHYS F650 **Aeronomy**
3 Credits Offered Fall Even-numbered Years
The physical and chemical processes that govern the response of planetary atmospheres to solar radiation and energetic particles. Formation of and characteristic processes in the layers within the ionosphere and basic magneto-ionic theory. Includes principles of remote sensing by lidar and radar techniques. ***Prerequisites: graduate standing; or permission of instructor.*** (3+0)

PHYS F651 **Quantum Mechanics**
3 Credits Offered Fall Even-numbered Years
Schrödinger's equations, operator formalism, correspondence principle, central force problems, perturbation theory, quantum statistical mechanics, and applications of quantum mechanics to collision problems, radiation and spectroscopy. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

PHYS F652 **Quantum Mechanics**
3 Credits Offered Spring Odd-numbered Years
Schrödinger's equations, operator formalism, correspondence principle, central force problems, perturbation theory, quantum statistical mechanics, and applications of quantum mechanics to collision problems, radiation and spectroscopy. ***Prerequisites: PHYS F651 or the equivalent; graduate standing; or permission of instructor.*** (3+0)

PHYS F660 **Radiative Transfer**
3 Credits Offered as Demand Warrants
The interaction of radiation with matter. The physical processes related to scattering, absorption and emission of radiation in an optical medium as well as the formulation and mathematical solution of radiative energy transport including multiple scattering in layered media. Demonstrations of how to use the theory in remote sensing applications and earth radiation budget studies (climate). ***Prerequisites: Graduate standing in chemistry, geology or physics; or permission of instructor.*** (3+0)

PHYS F672 **Magnetospheric Physics**
3 Credits Offered Spring Even-numbered Years
The physics and dynamics of Earth's magnetosphere. Discusses the magnetosphere as a test bed for microscopic plasma processes equilibrium configurations, plasma instabilities, highly nonlinear eruptive plasma processes, and global dynamics which involve the interaction of various regions of the magnetosphere. Introduction to various aspects of magnetospheric physics with a systematic discussion of the various elements of the magnetosphere, their structure and dynamics, and a discussion of the relevant plasma physics. ***Prerequisites: PHYS F626; graduate standing; or permission of instructor.*** (3+0)

PHYS F673 **Space Physics**
3 Credits Offered Alternate Fall Odd-numbered Years
Plasma physics of the heliosphere from the solar core to the interstellar medium. Includes coronal structure, interplanetary magnetic field and solar wind, shocks, interactions with planets, planetary magnetospheres, cosmic rays, solar-terrestrial relations and instrumentation. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

POLITICAL SCIENCE

PS F100X **Political Economy** (s)
3 Credits
Evolution and operation of the American domestic political economy with consideration of market failures and government responses. Review of major issues in political economy such as inflation, poverty and budget deficits. Exploration of linkages between American and global systems. Also available through the Center for Distance Education. ***Prerequisites: Placement in ENGL F111X or higher or permission of instructor.*** Cross-listed with ECON F100X. (3+0)

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PS F101 **Introduction to American Government and Politics** (s)
3 Credits
Principles, institutions and practices of American national government; the Constitution, federalism, interest groups, parties, public opinion and elections. Also available through the Center for Distance Education. (3+0)

PS F201 **Comparative Politics** (s)
3 Credits Offered Fall
Introduction to the systematic study of government and politics in countries other than the U.S. Students will explore such questions as why some countries are democracies and other countries dictatorships; why some remain stable and peaceful, while others seem in constant turmoil. This is a prerequisite for other courses in comparative politics. (3+0)

PS F202 **Democracy and Global Society** (s)
3 Credits Offered Spring Even-numbered Years
Examination of the various definitions and types of democracy and the global contexts within which they develop. Cases used draw from a wide range of states, societies and world-historical contexts, and allow comparisons among developed and developing countries. (3+0)

PS F203 **Peace, War and Security** (s)
3 Credits Offered Fall Even-numbered Years
Introduction to the major challenges of maintaining a peaceful and secure world. What are the major threats to our security and how are they met? The course analyzes political, cultural, moral and legal norms surrounding war and terrorism and different means of organizing for peace and security. (3+0)

PS F205 **Leadership, Citizenship and Choice**
3 Credits Offered Spring
History of democratic principles in America and how people can contribute to political and community life in the local, state and national arenas, as leaders and citizens. Examines ethical dilemmas of leadership, and political and social issues facing Alaska and American societies. Course includes an experiential learning component. Cross-listed with NORS F205. (3+0)

PS F212 **Introduction to Public Administration** (s)
3 Credits Offered as Demand Warrants
Theories and practice of public administration, especially as applied to federal agencies. Study of organization, planning and decision making in implementing public policy. (3+0)

PS F222 **Political Science Research Methods** (s)
3 Credits Offered Fall Even-numbered Years
Familiarizes students with the research methods that have been used to produce political knowledge about significant political phenomena. Includes both qualitative and quantitative research methods. ***Prerequisites: PS F101; must be completed before a student advances to senior standing in the discipline.*** (3+0)

PS F263 **Alaska Native Politics** (s)
3 Credits Offered Spring Odd-numbered Years
Political development, organization, interests and activities of Alaska Natives; treatment of ethnic leadership issues, history of federal Indian policy, evolution of Native leadership, village and regional government, land claims, and community politics from the Alaska Native brotherhood to ANCSA to the Alaska Native Coalition. Compares Alaska Native political developments to those of other circumpolar Northern Native communities. (3+0)

PS F300X **Ethics and Society** (h)
3 Credits
What is the right thing to do? A presentation of important theories of values, morality and ethics. Application of theories to dilemmas of choice in the public world, such as euthanasia, abortion, animal rights, sexual morality and environmental ethics. Also available through the Center for Distance Education. ***Prerequisites: Placement in ENGL F111X or higher; junior standing; or permission of instructor. Recommended: Two courses in the Perspectives on the Human Condition baccalaureate core.*** (3+0)

PS F301 **American Presidency** (s)
3 Credits Offered Fall Even-numbered Years
The institution of the presidency in the American political system. ***Prerequisites: PS F101 or permission of instructor.*** (3+0)

PS F302 **Congress and Public Policy** (s)
3 Credits Offered Spring Odd-numbered Years
The American Congress in the political system. ***Prerequisites: PS F101 or permission of instructor.*** (3+0)

PS F303 **Politics and the Judicial Process** (s)
3 Credits Offered Fall
The role of federal courts as political institutions. The politics of judicial selection, the nature of judicial decision-making and intracourt politics, litigations as a policy making device, changes in the nature and scope of judicial power, governmental attorneys, the legal bureaucracy, and judicial agenda setting. ***Prerequisites: PS F101 or permission of instructor.*** (3+0)

PS F314 W **Political Ideologies** (s)
3 Credits Offered Fall Even-numbered Years
An examination of the purpose of ideology as an orienting set of political ideas with mass appeal. Analysis of 20th century ideologies, including anarchism, communism, liberalism, socialism, environmentalism and feminism. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; PS F101; or permission of instructor.*** (3+0)

PS F315 **American Political Thought** (s)
3 Credits Offered Spring Odd-numbered Years
Political ideas in the U.S. from colonial times to the present: Puritanism, revolutionary ideas, Constitutionalism, nature of the Union, Progressive movement and pragmatism. ***Prerequisites: PS F101 or permission of instructor. Recommended: HIST F131 and HIST F132 strongly recommended.*** (3+0)

PS F321 **International Politics** (s)
3 Credits Offered Fall
Introduction to the problems, literature and terminology of international relations. Provides a basis for understanding current international affairs. Examines relations between nations, regions and groups, as well as ideas of conflict, security, trade, technology, negotiation, cooperation, revolution, modernization and community. (3+0)

PS F322 O **International Law and Organization** (s)
3 Credits Offered Spring Odd-numbered Years
Case studies in international law (rights and duties of states, jurisdiction and sovereignty, treaties, use of force and adjudication processes); development of regional organizations and integration; the United Nations. ***Prerequisites: COMM F131X or COMM F141X; PS F321; or permission of instructor.*** (3+0)

PS F323 **International Political Economy** (s)
3 Credits Offered Alternate Spring Odd-numbered Years
Exploration of the manner in which political and economic forces interact to affect international flows of goods, money, investments and technology. International political economic relations are examined in several contexts. ***Prerequisites: PS F100X or permission of instructor.*** (3+0)

PS F325 **Native Self-Government** (s)
3 Credits Offered as Demand Warrants
Indigenous political systems, customary law and justice in Alaska emphasizing the organization of Native governance, federal Indian Law and Alaska state chartered local government. Comparisons between Alaska Native political development and those of tribes in the contiguous 48 states and northern hemisphere tribal people. ***Prerequisites: HIST F100X; PS F263; or permission of instructor.*** Cross-listed with ANS F325. (3+0)

PS F340 **Women and Politics** (s)
3 Credits Offered Spring Odd-numbered Years
In-depth examination of the relevance of gender in political thought and action. Topics will vary and may include: an historical perspective of political

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ideas on the nature and status of women; women's involvement in national and/or international political movements and organizations; feminist approaches to the social sciences; feminism as a political ideology. ***Prerequisites: One political science course or permission of instructor. Recommended: WMS F201.*** Cross-listed with WMS F340. (3+0)

PS F401 W **Political Behavior** (s)
3 Credits Offered Spring Even-numbered Years
Attitudes, opinions and beliefs of the American electorate and the impact of these factors on political behavior; role of political organizations (parties and interest groups) in modern American politics. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** (3+0)

PS F403 W,O **Public Policy** (s)
3 Credits Offered Spring Even-numbered Years
The processes of policy development, implementation,and change are analyzed with major policy frameworks and models used in contemporary political science. These frameworks and models will be applied to environmental sustainability and other social policy issues. Students will develop expertise in a specific policy area and complete oral presentations related to their policy interests. ***Prerequisites: PS F101, upper division standing, or permission of instructor.*** Stacked with PS F603. (3+0)

PS F404 **Introduction to Legal Research and Writing**
3 Credits Offered Spring
Methods of legal research and preparation of legal materials. Introduction to the resources of law libraries and the techniques of presenting issues in legal form. ***Prerequisites: PS F101 or JUST F110.*** Cross-listed with JUST F404. (3+0)

PS F411 W,O **Classical Political Theory** (h)
3 Credits Offered Fall Odd-numbered Years
Political ideas from ancient Greece, Rome and the Judaeo-Christian tradition. Theories of Plato, Aristotle, Cicero, Augustine, and Aquinas. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; PHIL F102; PS F101; or permission of instructor.*** Cross-listed with PHIL F411. (3+0)

PS F412 W **Modern Political Theory** (s)
3 Credits Offered Spring Even-numbered Years
Political ideas from the Renaissance to the modern world. Theories of Machiavelli, Hobbes, Locke, Rousseau, Burke, Marx and Lenin. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; PHIL F102; PS F101; or permission of instructor.*** Cross-listed with PHIL F412. (3+0)

PS F425 **Federal Indian Law and Alaska Natives** (s)
3 Credits Offered Fall Even-numbered Years
The "special relationship" between the federal government and Native Americans based on land transactions and recognition of tribal sovereignty. Federal Indian law and policy evolving from this relationship. Legal rights and status of Alaska Natives. ***Prerequisites: PS F101; HIST F100X; or permission of instructor. Recommended: PS F263.*** Cross-listed with ANS F425. (3+0)

PS F435 W **Constitutional Law I: Federalism** (s)
3 Credits Offered Spring Odd-numbered Years
Constitutional doctrines and historical evolution of federalism and the separation of powers in the United States. Emphasis on the court's role in arbitering intergovernmental and interbranch disputes, the constitutional status of the administrative bureaucracy, and the control of war power and foreign policy. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; PS F101; or permission of instructor.*** (3+0)

PS F436 W **Constitutional Law II: Civil Rights and Liberties** (s)
3 Credits Offered Spring Even-numbered Years
Origin and development of civil rights and civil liberties in the U.S. Emphasis on the social, political and philosophical justifications of rights as expressed in judicial decision and constitutional doctrine. ***Prerequisites: ENGL F111X; ENGL F211X or F213X; PS F101; or permission of instructor. Recommended: PS F303.*** (3+0)

PS F437 **United States Foreign Policy** (s)
3 Credits Offered Spring Even-numbered Years
U.S. foreign policy in the postwar and post cold war period, including development of policy (domestic and foreign influences), administration of political, economic and military policies, and evaluation of policy effectiveness. Analyzes the historical background of the U.S. role in the world today and leading personalities and events that are a part of it. ***Prerequisites: PS F321; or permission of instructor.*** (3+0)

PS F447 **U.S. Environmental Politics** (s)
3 Credits Offered Spring
Examination of U.S. political institutions as they relate to making policies for protecting the quality of the natural environment. The politics of nuclear waste, endangered species, air and water pollution, and wilderness preservation. Analysis of the National Environmental Policy Act, sustainable development, limits to growth and other topics. Course is also available online. ***Prerequisites: Upper-division standing or permission of instructor. Recommended: PS F101.*** Stacked with NORS F647; PS F647. (3+0)

PS F450 **Comparative Indigenous Rights and Policies** (s)
3 Credits Offered as Demand Warrants
Comparative approach to analyzing Indigenous rights and policies in different nation-state systems. Multiple countries and specific policy developments examined for factors promoting or limiting self-determination. ***Prerequisites: Upper division standing or permission of instructor.*** Cross-listed with ANS F450. Stacked with PS F650. (3+0)

PS F452 **International Relations of the North** (s)
3 Credits Offered Spring Odd-numbered Years
Examination of the international strategies of circumpolar states. Consideration of theoretical and practical elements of strategy formation in major issue areas such as national security, the political economy, human rights and scientific exchange. ***Prerequisites: Upper-division standing or permission of instructor.*** Stacked with NORS F652; PS F652. (3+0)

PS F454 **International Law and the Environment** (s)
3 Credits
International environmental law. Includes international case law regulating the sea, airspace, outer space and the polar regions; comprehensive international regulatory and legal instruments to protect the environment (e.g. the U.N. Framework Convention on Climate Change); and the doctrines, principles, and rules of international law that are basic to an understanding of international legal regimes and the environment. Course is also available online. ***Prerequisites: Upper-division standing; permission of instructor. Recommended: Undergraduate course in international law, organization, or politics.*** Stacked with NORS F654; PS F654. (3+0)

PS F455 O **Political Economy of the Global Environment** (s)
3 Credits Offered Fall Even-numbered Years
Interaction between basic aspects of the global economy (international trade, investment and development) and the natural environment. Topics include the economic impact of global environmental agreements and the environmental impact of global markets, transitional corporations, and development assistance by organizations such as the World Bank. ***Prerequisites: COMM F131X or COMM F141X; upper-division standing; permission of instructor.*** Stacked with NORS F655; PS F655. (3+0)

PS F456 O **Science, Technology, and Politics** (s)
3 Credits Offered Spring Odd-numbered Years
Relationship of science, technology and politics. Connections among scientific knowledge, technology, technological innovations, politics and power. Gender roles and the influence of western science. Both historical and comparative aspects are included. Course is also available online. ***Prerequisites: COMM F131X or COMM F141X; upper-division standing or permission of instructor. Recommended: PS F101.*** Stacked with NORS F656; PS F656. (3+0)

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PS F458 **Comparative Environmental Politics** (s)
3 Credits Offered Fall Odd-numbered Years
Enduring issues of the field of comparative politics and their relation to global environmental problems. Biodiversity, transboundary pollution, and climate warming. Explores how state-society relations, political institutions, national political capacity, political processes and organizations, and international commitments potentially shape the nature and dynamics of global environmental politics and vice versa. Course is also available online. ***Prerequisites: Upper-division standing; or permission of instructor. Recommended: PS F201 or equivalent comparative politics course.*** Stacked with NORS F658; PS F658. (3+0)

PS F460 W **Government and Politics of Canada** (s)
3 Credits Offered Spring Odd-numbered Years
The Canadian political system, covering the Canadian constitution, federal structure, parliamentary government and public policy, as well as contemporary issues concerning Native rights and the Canadian North. Students will complete a major research paper on specific policy areas (language, education, health care, environment, natural resources, foreign relations). ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; PS F201; upper-division standing; or permission of instructor.*** Stacked with NORS F660; PS F660. (3+0)

PS F462 **Alaska Government and Politics** (s)
3 Credits
Alaska's government and politics, in the context of American state and local government, and politics and governments of circumpolar northern nations. Topics include political history, constitution, political parties, interest groups, elections, public opinion, governor, legislature, judiciary, administration and local governments. Compares Alaska to the contiguous 48 states and subnational governments of the circumpolar North; examines how government institutions and processes respond to social, environmental and political changes of Northern communities. ***Prerequisites: Upper-division standing or permission of instructor.*** Stacked-with: NORS F662; PS F662. (3+0)

PS F464 W **East Asian Governments and Politics** (s)
3 Credits Offered Fall Even-numbered Years
Modern East Asia (including China, Taiwan, Japan, North and South Korea) politics and society, including governmental institutions, political processes and regional and global foreign relations. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; PS F201; or permission of instructor.*** (3+0)

PS F467 W **Political Development in Latin America and the Caribbean** (s)
3 Credits Offered Fall Odd-numbered Years
Exploration of major issues and concepts in the development and governances of modern Latin America and the Caribbean region, including the legacies of colonialism, revolution, military rule, economic challenges and the quest for democratic stability. Includes a historical overview of the region and cases drawn from the Caribbean, Mexico, Central and South America. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; PS F201 or HIST F102; or permission of instructor. Recommended: SPAN F221.*** Cross-listed with HIST F467. (3+0)

PS F468 W **Government and Politics of Russia** (s)
3 Credits Offered Spring Even-numbered Years
Current developments in Russia from a number of perspectives. The effect of history and geography on political change; the nature of Russian government and society; the legacies of Lenin, Stalin, Gorbachev and the ideological nature of regimes and leadership. Economic forces and the political struggle in governance; revolution, democracy and reform; and the international role of Russia, particularly in relation to the former Soviet republics, Eastern Europe and other border areas. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; PS F201; or permission of instructor.*** Stacked with NORS F668; PS F668. (3+0)

PS F472 **Ethics in International Affairs** (h)
3 Credits Offered Spring Odd-numbered Years
Examination of questions including: What is in the interest of the nation-state according to the logic of statecraft? How does the national interest relate to the broader human interest? How does morality relate to the international legal order? Examination is through theory and case studies. ***Prerequisites: PHIL F322X or equivalent or PS F321; or permission of instructor.*** Cross-listed with PHIL F472. (3+0)

PS F475 **Internship in Public Affairs**
3 Credits
Individual study of public agencies or organizations through actual experience. ***Prerequisites: Permission of instructor.*** (3+0)

PS F499 W **Senior Thesis**
3 Credits
Thesis will draw from the literature in at least two sub-fields of political science (U.S. government/politics, political theory, public law, comparative politics, international relations) in its analysis. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; PS F101; PS F222; senior standing; permission of instructor.*** (1.5+0+7.5)

PS F603 **Public Policy**
3 Credits Offered Spring Even-numbered years
The processes of policy development, implementation, and change are analyzed along with major policy frameworks and models used in contemporary political science. These frameworks and models will be applied to environmental sustainability and other social policy issues. Students will develop expertise in a specific policy area and skills in research design preparing them to analyze public policy. ***Prerequisites: Graduate Standing.*** Cross-listed with NORS F603. Stacked with PS F403. (3+0)

PS F647 **U.S. Environmental Politics**
3 Credits
U.S. political institutions as they relate to making policies for protecting the quality of the natural environment. The politics of nuclear waste, endangered species, air and water pollution, and wilderness preservation. Analysis of the National Environmental Policy Act, sustainable development, limits to growth and other topics. Course is also available online. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with NORS F647. Stacked-with: PS F447. (3+0)

PS F650 **Comparative Indigenous Rights and Policies**
3 Credits Offered as Demand Warrants
Comparative approach to analyzing Indigenous rights and policies in different nation-state systems. Multiple countries and specific policy developments examined for factors promoting or limiting self-determination. ***Prerequisites: Graduate Standing.*** Stacked with PS F450; ANS F450. (3+0)

PS F654 **International Law and the Environment**
3 Credits Offered Fall Odd-numbered Years
International environmental law. Includes international case law regulating the sea, airspace, outer space and the polar regions; comprehensive international regulatory and legal instruments to protect the environment (e.g., the U.N. Framework Convention on Climate Change); and the doctrines, principles, and rules of international law that are basic to an understanding of international legal regimes and the environment. Course is also available online. ***Prerequisites: Graduate standing or permission of instructor. Recommended: Undergraduate course in international law, organization, or politics.*** Cross-listed with NORS F654. Stacked with PS F454. (3+0)

PS F655 **Political Economy of the Global Environment**
3 Credits Offered Fall Odd-numbered Years
Interactions between basic aspects of the global economy (international trade, investment and development) and the natural environment. Topics include the economic impact of global environmental agreements and the environmental impact of global markets, transnational corporations, and development assistance by organizations such as the World Bank. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with NORS F655. Stacked with PS F455. (3+0)

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PS F656 Science, Technology, and Politics
3 Credits
Relationship of science, technology and politics. Connections among scientific knowledge, technology, technological innovations, politics and power. Both historical and comparative aspects are included. Course is also available online. ***Prerequisites: Graduate standing or permission instructor. Recommended: PS F101.*** Cross-listed with NORS F656. Stacked with PS F456. (3+0)

PS F658 Comparative Environmental Politics
3 Credits Offered Fall Odd-numbered Years
Enduring issues of the field of comparative politics and their relation to global environmental problems. Biodiversity, transboundary pollution and climate warming. Explores how state-society relations, political institutions, national political capacity, political processes and organizations, and international commitments potentially shape the nature and dynamics of global environmental politics and vice versa. Course is also available online. ***Prerequisites: Graduate standing or permission of instructor. Recommended: PS F201 or equivalent comparative politics course.*** Cross-listed with NORS F658. Stacked with PS F458. (3+0)

PS F660 Government and Politics of Canada
3 Credits Offered Spring Odd-numbered Years
The Canadian political system, covering the Canadian constitution, federal structure, parliamentary government and public policy, as well as contemporary issues concerning Native rights and the Canadian North. Students will complete a major research paper on specific policy areas (language, education, health care, environment, natural resources, foreign relations). ***Prerequisites: PS F201; graduate standing; or permission of instructor.*** Cross-listed with NORS F660. Stacked with PS F460. (3+0)

PS F662 Alaska Government and Politics
3 Credits Offered Spring Odd-numbered Years
Alaska's government and politics, in the context of American state and local government, and politics and governments of circumpolar northern nations. Topics include political history, constitution, political parties, interest groups, elections, public opinion, governor, legislature, judiciary, administration and local governments. Compares Alaska to the contiguous 48 states and subnational governments of the circumpolar North; examines how government institutions and processes respond to social, environmental and political changes of Northern communities. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with NORS F662. Stacked-with: PS F462. (3+0)

PS F668 Government and Politics of Russia
3 Credits
Current developments in Russia from a number of perspectives. The effect of history and geography on political change; the nature of Russian government and society; the legacies of Lenin, Stalin, Gorbachev, and the ideological nature of regimes and leadership. Economic forces and the political struggle in governance; revolution, democracy and reform; and the international role of Russia, particularly in relation to the former Soviet republics, Eastern Europe and other border areas. ***Prerequisites: PS F201; graduate standing; or permission of instructor.*** Cross-listed with NORS F668. Stacked with PS F468. (3+0)

POWER GENERATION

PGEN F101 Introduction to Power Generation, Distribution and Alternative Energy
3 Credits
Designed for those interested in gaining knowledge of the modern methods of commercial power generation and its distribution. Provides an overview of current trends toward the development of stable, sustainable, alternative energy, production method(s) and terminology/concepts relative to modern industrial power generation. ***Recommended: ENGL F111X; any 100-level MATH.*** (3+0)

PGEN F102 Basic Electricity for Power Generation Operators
4 Credits
Introduction to basic electrical theory and to hands-on training for basic electricity. Introduction to basic electrical equipment, systems, and instrumentation utilized in the production and control of commercial electrical power generation. ***Recommended: ENGL F111X; any F100-level MATH.*** (3+2)

PGEN F103 Introduction to Power Generation: Maintenance
4 Credits
Designed for those interested in advancing their knowledge of maintenance relative to the commercial power industry. Provides overview of power generation equipment and the routine maintenance required to keep the equipment. Also provides an overview of safe working practices, tools, procedures, drawings, Piping and Instrumentation (P&ID's) and Process Safety Management (PSM). ***Prerequisites: PGEN F101; PGEN F102; or permission of instructor. Recommended: Computation course.*** (3+2)

PGEN F104 Gas and Steam Turbines: Cogeneration and Combined Cycle Technologies
4 Credits
Introduces basic information associated with modern gas and steam turbines, and the systems in which they are used to produce electrical power and/or steam for heating. ***Prerequisites: PGEN F101; PGEN F102; PGEN F103; or permission of instructor. Recommended: Computation course.*** (4+0)

PROCESS TECHNOLOGY

PRT F101 Introduction to Process Technology
3 Credits
Introduction to process operations in industry. Non-mathematical overview of general information, processes, procedures and equipment a process operator would be expected to know and use. (3+0)

PRT F110 Introduction to Occupational Safety, Health and Environmental Awareness
3 Credits
Overview of the field of safety, health and environment within the process industry. Covers plant hazards, safety, and environmental systems and equipment, and applicable government regulations and industry standards. (3+0)

PRT F117 Drafting for Technicians
3 Credits Offered as Demand Warrants
Skills and techniques needed to produce process piping and instrumentation drawings. Special fees apply. (2+2)

PRT F120 Water Quality Management for Process Industries
4 Credits Offered as Demand Warrants
Overview of the chemistry, biology, hydraulics and hydrology related to water management in industries. Water distribution systems, water processing, operation of water works, wastewater processing, advanced wastewater treatment and water reuse. (3+3)

PRT F130 Process Technology I: Equipment
4 Credits
Selected process equipment including rotating machinery and process units. Emphasis on equipment components, construction, preventative maintenance and safety. Includes hands-on experience. ***Prerequisites: PRT F101.*** (3+2)

PRT F135 Stationary Equipment
4 Credits Offered Fall
A detailed hands-on lecture/lab course covering stationary equipment used in a variety of process industries. Piping, valves, vessels, tanks, exchangers, heaters, boilers, mineral processing, mill equipment and distillation equipment are covered. (3+2)

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PRT F140 Industrial Process Instrumentation I
3 Credits
Physics of pressure, temperature, level and flow measurement; mechanical and electrical aspects of instruments used to control dynamics of processes. Dynamics of automatic control including proportional control, automatic reset, derivative action and integral timing. ***Prerequisites: DEVM F105 or permission of instructor.*** (2+2)

PRT F144 Industrial Process Instrumentation II
3 Credits
Continuation of PRT F140. Emphasis on repair, maintenance and calibration, including hands-on physical training on a wide variety of process instruments. ***Prerequisites: PRT F140.*** (2+2)

PRT F160 Oil and Gas Exploration and Production I
3 Credits
Surveys oil and gas exploration and production issues including marketing, geology, reservoir economics, legal aspects of resource ownership, drilling and production technologies, product separation, safety and environmental issues. Course may not be audited. ***Prerequisites: Must be enrolled in the PRT program or permission of Program Chair.*** (3+0)

PRT F230 Process Technology II: Systems
4 Credits
Integration of equipment concepts to show how the individual components interact as part of a system and how each system works within an entire processing facility. Emphasis on the common systems found in each Alaska process industry. Systems topics include upstream oil and gas productions, petrochemicals and refinery processes, refrigeration, power generation, milling, boilers and heaters, coolers and heat exchangers. ***Prerequisites: PRT F130.*** (3+2)

PRT F231 Process Technology III: Operations
4 Credits
Duties and responsibilities of the process operator on the job. Includes the details of normal operation, upset conditions, emergency action plans, start-ups, shutdowns, operating modes, turnarounds and routing maintenance activity. ***Prerequisites: PRT F230.*** (3+2)

PRT F240 Industrial Process Instrumentation III
3 Credits Offered as Demand Warrants
A study of digital and analog industrial measurement and control instrumentation, including continuous analog control loops, relay logic and programmable logic controllers. Emphasis is on commonly used process measurement devices, control methods and strategies, and the proper selection, identification, design, installation and operation of instrumentation. ***Prerequisites: PRT F140; PRT F144; or permission of instructor. Recommended: PRT F155 or MATH F103X or higher.*** (2+2)

PRT F248 Valve Maintenance and Instrumentation
3 Credits Offered as Demand Warrants
Specific advanced subjects of industrial process valve maintenance and instrumentation. Includes calibration, configuration, troubleshooting, and use of valves with instrumentation. Concepts of contemporary plant control systems, commonly used industrial process measurement, control communication protocols and topologies related to valve control will be discussed. Covers maintenance and operation of gate, globe, ball, plug, check and special-purpose valves. Details of actuators and various accessories related to valve maintenance and control will be explained and related to valve selection based on application. ***Recommended: PRT F130.*** (3+1)

PRT F250 Process Troubleshooting
3 Credits
Troubleshooting process operations and problems. Using indicators, variables and controllers along with a formalized process of troubleshooting. Troubleshooting examples will reflect current needs of industry. ***Prerequisites: PRT F231.*** (3+0)

PRT F255 Quality Concepts for the Process Industry
1 Credit
Introduction to current quality concepts applied to role of process technician. Includes quality concepts with respect to the client and the role of statistical processes used by the operator in achieving quality. (1+0)

PRT F275 Process Technology Internship
1-9 Credits Offered as Demand Warrants
Working experience in and exposure to various stages and settings within the process industry. Endorsed and promoted by Alaska Process Industry Careers Consortium, the internship is an intensive exposure to the various duties and responsibilities of the process operator in Alaska. A maximum of 9 credits may be earned. ***Prerequisites: Permission of instructor. Recommended: PRT F101, PRT F110, PRT F140.*** (0+5-45)

PSYCHOLOGY

PSY F101 Introduction to Psychology (s)
3 Credits
Principles of general psychology emphasizing natural science and social science orientation. Cultural, environment, heredity and psychological basis for integrated behavior; visual, audition and the other senses; motivation and emotion; basic processes in learning, problem solving, and thinking; personality; psychological disorders — their prevention and treatment, and therapeutic strategies. Also available through the Center for Distance Education or via television as a self-paced, computer-aided course. (3+0)

PSY F240 Lifespan Developmental Psychology (s)
3 Credits
The psychology of human development from conception to death. Critical emphasis on theory and research within the field of developmental psychology with attention paid to similarities and differences in development across cultures. Topics include the psychological ramifications of physical development along with cognitive, personality, and social development across the lifespan. Also available through the Center for Distance Education. ***Prerequisites: PSY F101.*** (3+0)

PSY F245 Child Development
3 Credits
Physical, cultural, emotional, cognitive and social aspects of a child's development from the prenatal period through early adolescence. Focus on developmental theories including Erickson, Gardner, Gilligan, Kagen, Sternberg, Vygotsky and other contemporary theories of child and adolescent development. ***Prerequisites: PSY F101 or permission of instructor.*** Cross-listed with ED F245. (3+0)

PSY F250 Introductory Statistics for Behavioral Sciences
3 Credits Offered Spring
Statistics applied to social scientific topics. Includes descriptive statistics, frequency distributions, sampling distributions, elementary probability, estimation of population parameters, hypothesis testing (one- and two-sample problems), correlation, simple linear regression and one-way analysis of variance. Also available through the Center for Distance Education. ***Prerequisites: MATH F103X or MATH F107X or MATH F200X.*** Cross-listed with SOC F250. (3+0)

PSY F275 Introduction to Social Science Research Methods (s)
3 Credits Offered Spring
Introduction to research methods in psychology. Includes the scientific process, developing research ideas, experimental and non-experimental designs, sampling, surveys and data analysis. ***Prerequisites: PSY F101.*** (3+0)

PSY F304 Personality (s)
3 Credits Offered Fall
Psychological and social/cultural determinants of personality formation including appropriate theories in both areas. ***Prerequisites: PSY F101.*** (3+0)

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PSY F310 O **Cross-Cultural Psychology** (s)
3 Credits Offered Spring
Major theories and research related to understanding the impact of culture on psychological development, cognition, social behavior, perception, and models for the conceptualization of distress and disease. Models for research and inquiry across culture will be discussed in the context of examining cross-cultural research on selected topics. ***Note: Meets departmental community service requirement for Psychology major. Prerequisites: COMM F131X or COMM F141X; PSY F101; PSY F240.*** (3+0)

PSY F320 **History and Systems of Psychology** (s)
3 Credits Offered as Demand Warrants
The history of present psychology from associationism to humanism with attention to both the philosophical and physiological foundations of psychology, the most important theorists and movements, and paradigmatic shifts in the evolution of contemporary psychological systems. ***Prerequisites: PSY F101.*** (3+0)

PSY F330 **Social Psychology** (s)
3 Credits Offered Spring
Analysis of intergroup relationships in terms of process and value orientation, their influences on the personality, and aspects of collective behavior on group and person. Aspects of social interaction that have cultural and intercultural variation. ***Prerequisites: PSY F101 or SOC F100X.*** Cross-listed with SOC F330. (3+0)

PSY F333 **Human Sexualities Across Cultures** (s)
3 Credits Offered Alternate Fall Odd-numbered Years
Exploration of how people in a variety of cultures, both contemporary and historical, construct the meaning and experience of sexuality, and express themselves as sexual beings. Interdisciplinary study includes psychology, sociology, anthropology, gender studies, and related fields, with particular focus determined by which department is offering the course. Also available through the Center for Distance Education. ***Prerequisites: SOC F100X; or SOC F201 or PSY F101 or WMS F201; or permission of instructor.*** Cross-listed with SOC F333; WMS F332. (3+0)

PSY F335 **Physiological Psychology**
3 Credits Offered Fall
Study of the biological bases of human behavior. Emphasis on functional anatomy of the nervous system to understand normal behavior and behavioral disorders in terms of their psychology, development, evolution and function. Also available through the Center for Distance Education. ***Prerequisites: PSY F101. Recommended: BIOL F115X and BIOL F116X; or BIOL F111X and F112X.*** (3+0)

PSY F337 W **Sport Psychology**
3 Credits Offered as Demand Warrants
Theoretical and practical applications of psychological issues related to participation in physical activities, including exercise adherence, performance enhancement, group dynamics, leadership and coaching behaviors, arousal/anxiety, intervention strategies and lifespan participation. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; PSY F101; or permission or instructor.*** (3+0)

PSY F345 **Abnormal Psychology** (s)
3 Credits Offered Fall
A study of abnormal behavior, its causes, treatment and social impact. The major classifications of disorders are presented. ***Note: Meets department community service requirement for Psychology major. Prerequisites: PSY F101.*** (3+0)

PSY F350 **Comparative Psychology**
3 Credits Offered Spring Even-numbered Years
An integrated multidisciplinary behavioral approach emphasizing basic premises, causal factors, functional consequences and interrelationships. Synthesis of animal behavior and ethology in development and maintenance of behavioral patterns in individual organisms and social groups. ***Prerequisites: PSY F101; BIOL F115X and BIOL F116X; or permission of instructor.*** (3+0)

PSY F360 O **Psychology of Women Across Cultures** (s)
3 Credits Offered Spring Odd-numbered Years
Major theories, research and empirical data which describes the psychology of women as a discrete field, philosophical values of feminism and history of women's roles in society. The impact of culture on women interpersonally and intrapsychically examined across cultures. ***Prerequisites: COMM F131X or COMM F141X; PSY F101; or permission of instructor.*** (3+0)

PSY F370 **Drugs and Drug Dependence** (s)
3 Credits Offered Fall Even-numbered Years
A multidisciplinary approach emphasizing acute and chronic alcoholism, commonly abused drugs, law enforcement and legal aspects of drug abuse, medical uses of drugs, physiological, psychological and sociological aspects of drug abuse, recommended drug education alternatives and plans, and treatment and rehabilitation of acute and chronic drug users. Also available through the Center for Distance Education. ***Prerequisites: PSY F101 or permission of instructor.*** (3+0)

PSY F380 **Environmental Psychology** (s)
3 Credits Offered as Demand Warrants
Human behavioral responses to the physical environment, such as stress, darkness and isolation. Didactic methods include empirical methods related to behavioral research. ***Prerequisites: PSY F101. Recommended: PSY F335.*** (3+0)

PSY F390 W,O **Industrial and Organizational Psychology** (s)
3 Credits Offered as Demand Warrants
Application of psychological principles, theories and methods to issues related to work processes and work organizations. Includes employee selection, motivation, performance appraisal, decision-making, group dynamics, power and leadership, job design, and organizational change and development. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; PSY F101; PSY F250 or equivalent; PSY F275 or equivalent.*** (3+0)

PSY F440 **Learning and Cognition** (s)
3 Credits Offered Spring Odd-numbered Years
Theory and research on the fundamentals of learning. Topics include information processing, attention and consciousness, learning processes, memory structures, retrieval, and the biological and cultural considerations relevant to each. Also available through the Center for Distance Education. ***Prerequisites: PSY F101; PSY F275.*** (3+0)

PSY F445 W **Community Psychology** (s)
3 Credits Offered Fall
Survey of principles and applications of community psychology, emphasizing person-environment interactions and societal and cultural impacts upon individual and community functioning. Attention given to interventions which facilitate psychological competence and empowerment, prevent disorder, and promote social change. Experiential learning emphasized through community service requirement. ***Note: Meets departmental community service requirement for Psychology major. Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; PSY F101; PSY F275.*** (3+0)

PSY F455 **Clinical Psychology**
3 Credits Offered as Demand Warrants
Survey of clinical psychology methods and approaches with consideration of psychological assessment and treatment. Topics include specific counseling strategies, such as psychoanalysis, behavior therapy, crisis intervention, rational-emotive and humanistic approaches, along with ethics in clinical practice and issues in cross-cultural counseling and psychological assessment and treatment. A clinical lab will allow students to apply their classroom learning and acquire hands-on experience in clinical skills. ***Prerequisites: PSY F240; PSY F275; PSY F345.*** (2+3)

PSY F469 **Health Psychology**
3 Credits Offered Fall
Scientific study of behaviors that relate to health enhancement, disease and injury prevention, safety and rehabilitation. While mental health is included,

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the emphasis is on physical health. Also available through the Center for Distance Education. ***Prerequisites: PSY F101; PSY F275; and junior standing.*** (3+0)

PSY F470 **Sensation and Perception**
3 Credits Offered Spring Even-numbered Years
An integrated psychological and physiological approach to sensation, including the fundamental mechanisms of vision, hearing, taste, smell and movement. Emphasis will include theoretical models and systems of perception, and how they are influenced by cultural, developmental, hereditary, physiological psychological and social factors. ***Note: Meets departmental community service requirement for Psychology major. Prerequisites: PSY F101 and PSY F275.*** (3+0)

PSY F475 W **Research Design and Analysis in Psychology** (s)
3 Credits Offered Fall Even-numbered Years
An integrated approach to the study of research design and analysis in psychology. Emphasis on research methodologies and techniques. Design, execution and analysis of social science research. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; PSY F101; PSY/SOC F250 or STAT F200X; PSY F275; permission of instructor.*** (2+3)

PSY F480 W **Qualitative Social Science Research** (s)
3 Credits Offered Spring Odd-numbered Years
Introduction to classical and contemporary research within the qualitative (or interpretive) paradigm of social science. Discusses the theoretical frameworks, historical traditions, epistemological and ethical issues of qualitative approaches. Uses hands-on experience in the practicalities and excitement of a variety of methods for gathering qualitative data and conducting qualitative analyses. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; one lower-division social science research methods course; or permission of instructor.*** Cross-listed with SOC F480. (3+0)

PSY F485 **Senior Seminar** (s)
3 Credits Offered Spring
Synthesis and integration of knowledge and skills developed by psychology majors. Includes a general knowledge of psychology, a basic knowledge of the research process and methods, insights into the way culture, gender, ethnicity, social class, and other diversity issues influence research and practice in psychology. ***Prerequisites: PSY F275; Psychology major with senior standing.*** (3+0)

PSY F488 **Practicum in Psychology**
1-6 Credits
Individual practice and training to work in a setting or experience the work of a psychologist. Faculty supervision on campus or on site. Requires 50 clock hours per credit hour. Placement must be arranged before registering for course. Graded Pass/Fail. ***Prerequisites: Permission of instructor.*** (1+0)

PSY F601 **Clinical/Community/Cross-Cultural Integration Seminar**
1 Credit
Introduces current trends in community, clinical and indigenous psychology. Students are encouraged to explore how these three fields complement each other to bring about positive change in community and clinical settings. Special emphasis on ways to conceptualize mental health and community issues in culturally appropriate ways. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. Graded Pass/Fail. ***Prerequisites: Graduate standing in Psychology or permission of instructor.*** (1+0)

PSY F602 **Native Ways of Knowing**
3 Credits Offered Fall
Covers the appropriate and valid ways of describing and explaining human behavior by using the social context, culture and history of indigenous groups. Includes indigenous approaches to values, health, the interconnection of family and community; the nature of spirituality and indigenous healing; and the importance of elders and spiritual healers. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: Admittance to the Psychology Ph.D. program or permission of instructor.*** (3+0)

PSY F603 **Alaska and Rural Psychology**
3 Credits Offered Spring
Introduces rural community psychology, including the diversity of rural communities, with emphasis on Alaska and the rural circumpolar North. Provides an introduction to rural health promotion, prevention and behavioral health care, and a basis for understanding many of the issues of services planning and delivery in rural areas. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: PSY F632; graduate standing in Psychology; or permission of instructor.*** (3+0)

PSY F604 **Biological and Pharmacological Bases of Behavior**
3 Credits Offered Fall
Biological underpinnings of behavior and the basic principles of pharmacology. Deals with physiological causes and contributors to psychopathology and the medical sequelae of psychiatric disorders. Topics will include issues such as differential diagnosis, referral for medical or psychiatric evaluation and the functional and structural characteristics of relevant physiological systems. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: PSY F622; graduate standing in Psychology; or permission of instructor.*** (3+0)

PSY F605 **History and Systems of Psychology**
1 Credit Offered Fall
A brief philosophically oriented overview of the history of psychology. Compares Western psychology in the 19th and 20th centuries and selected indigenous psychologies of Asia and North America. Special attention is given to systems of thought that have emerged since the founding of psychology as an empirical science. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: Graduate standing in Psychology or permission of instructor.*** (1+0)

PSY F606 **Native Ways of Healing**
3 Credits
Explores healing from a variety of Native perspectives, particularly from an Alaska Native perspective. Emphasizes the preparation and education of healers, their roles and work and integration within the community. Students will have the opportunity to examine the possible integration of clinical and community psychology with indigenous approaches to healing. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: Graduate standing in Psychology or permission of instructor.*** (3+0)

PSY F607 **Cognition, Affect and Culture**
3 Credits Offered Spring
Presents an overview of attention, memory, appraisal and emotion with applications to clinical psychology in a cultural context. Cultural influences on emotional experience and cognition are explored. The etiology and treatment of psychological disorders with significant cognitive and affective disturbance are explored. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: Graduate standing in Psychology or permission of instructor.*** (3+0)

PSY F610 **Alcohol: Pharmacology and Behavior**
3 Credits Offered as Demand Warrants
A multidisciplinary approach to the study of alcohol abuse and alcoholism which incorporates the biomedical, epidemiological, genetic, pharmacological, psychological, social and cultural bases. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

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PSY F611 **Ethics and Professional Practice**
3 Credits Offered Spring
Comprehensive overview of ethical principles and legal statutes involved in clinical and community practice and research. Designed as a forum for discussion of ethical issues and other concerns relevant to professionals in psychology, with particular emphasis given to ethical issues in cross cultural and rural contexts in Alaska. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: Admittance to the Psychology Ph.D. program or permission of instructor.*** (3+0)

PSY F612 **Human Development in a Cultural Context**
3 Credits Offered Spring
Study of development theory, research and substantive applied issues across the life span. Particular emphasis on understanding how culture and sociocultural context impact the interplay of biology and environment in development of essential qualities and characteristics of individuals. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: Graduate standing in Psychology or permission of instructor.*** (3+0)

PSY F614 **Human Adaptation to the Circumpolar North**
3 Credits Offered as Demand Warrants
Patterns of individual and family adaptation to the stresses and opportunities of northern regions. Focuses on successful and unsuccessful responses to northern conditions — the arctic climate, the northern economy, cultural diversity, and the professional opportunities and stress factors of sparsely populated frontier settings. Students will complete an original research paper. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

PSY F616 **Program Evaluation and Community Consultation I**
3 Credits Offered Fall
The first in a two-course series, providing an overview of theories, methods and applications of program evaluation and community consultation as tools for facilitating systemic and programmatic changes in community and clinical settings. Seminar covers techniques of entry into various settings and designing program evaluations in collaboration with various community organizations. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: PSY F639; graduate standing in Psychology; or permission of instructor.*** (3+0)

PSY F617 **Program Evaluation and Community Consultation II**
3 Credits Offered Spring
The second in a two-course series, introducing the principles and dynamics involved in various types of consultative relationships in community and clinical settings, with a focus on cross-cultural and ethical issues. Covers methods of program evaluation implementation and use of program evaluation findings for consulting with relevant stakeholders. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: PSY F616; graduate standing in Psychology or permission of instructor.*** (3+0)

PSY F618 **Community Treatment Alternatives**
3 Credits Offered as Demand Warrants
Examination of the role of community in the treatment of mental health problems among indigenous or ethnic groups. Focus on bringing the resources of the community to bear on the healing process. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

PSY F620 **Treatment of Drug and Alcohol Dependency**
3 Credits Offered as Demand Warrants
Examination of the treatments available for drug and alcohol abuse. Medical and psychological treatments will be studied. Medical treatments include abrupt, gradual and substituting techniques. Psychological techniques include traditional Western therapies as well as less traditional approaches. ***Prerequisites: PSY F610 or PSY F615; graduate standing or permission of instructor.*** (3+0)

PSY F622 **Multicultural Psychopathology**
3 Credits Offered Fall
An overview of contemporary views on child and adult psychopathology from a multicultural perspective. The fundamentals of clinical interviewing and diagnostics. Includes training in the DSM-IV diagnostic system. The role of culture, ethnicity, gender and social class in symptom formation and the experience of psychological disorders will be examined. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: Graduate standing in Psychology or permission of instructor.*** (3+0)

PSY F623 **Intervention I**
3 Credits Offered Fall
Increases knowledge and skills related to traditional and nontraditional therapeutic interventions. Students are provided with a range of theoretical perspectives, a conceptual understanding of and an opportunity to practice a wide range of culturally relevant and appropriate techniques that are applicable in traditional and non-traditional community mental health settings. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: Graduate standing in Psychology or permission of instructor.*** (3+0)

PSY F625 **Prevention of Alcohol and Drug Dependency**
3 Credits Offered as Demand Warrants
Study of the various ways to prevent alcohol dependency, especially among indigenous peoples or in ethnic groups. Emphasis on cross-cultural approaches to the prevention of dependency. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

PSY F629 **Intervention II**
3 Credits Offered Spring
Deepens understanding of the variety and application of intervention techniques in diverse settings. Directs students to explore the efficacy of specific interventions in a range of settings and with a variety of populations. Shapes critical thinking and basic intervention evaluation skills. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: PSY F623; admittance to Psychology Ph.D. program or permission of instructor.*** (3+0)

PSY F630 **Community Psychology**
3 Credits Offered Fall
Current status of community psychology, focusing on person-environment interactions and societal and cultural impacts upon individual and community functioning. An advanced-level overview of theory, research and practice of community psychology with particular emphasis on cross-cultural themes. Students are expected to apply their learning in a community-based experience. Goal is to empower students to contribute to effective change in their communities. ***Prerequisites: Admittance to Community Psychology Program or permission of instructor.*** (3+0)

PSY F631 **Community Psychology: Cross-Cultural Applications and the Ethics of Change**
3 Credits Offered as Demand Warrants
Advanced study of the application of community psychology with an emphasis on the design and evaluation of interventions which facilitate psychological competence and empowerment, prevent disorder, and promote social change. Value-context of community psychology and the ethics of intervention are examined with particular emphasis on applications to cross-cultural settings and indigenous approaches to change. Students are expected to continue and broaden their community-based experience. ***Prerequisites: PSY F630 or permission of instructor.*** (3+0)

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PSY F632 **Community Psychology Across Cultures**
3 Credits Offered Fall
An overview of theory, research and practice of community psychology with particular emphasis on cross-cultural themes, design and evaluation of interventions in remote and rural community settings, prevention and health promotion, and social change. Particular emphasis will be on issues relevant to Alaska Native communities. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: Graduate standing in Psychology or permission of instructor.*** (3+0)

PSY F633 **Tests and Measurement in Multi-Cultural Context**
3 Credits Offered Fall
Principles of construction, analysis and evaluation of psychological tests in a multicultural context. Emphasizes culturally sensitive application of psychological tests and measurements. Focuses on the history, theory and methods of psychological testing by examining intelligence, personality and vocation. Discusses widely-used intelligence and personality tests and procedures. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: Graduate standing in Psychology or permission of instructor.*** (3+0)

PSY F635 **Field-Based Research Methods**
3 Credits Offered Fall; As Demand Warrants
Methods used in doing cross-cultural research in community settings. Emphasis on formal descriptions of the interaction between people and their environments. The course will present a wide variety of designs, analyses and conceptual approaches appropriate to improving our general understanding of behavior in communities. Both quantitative and qualitative methods will be presented in the context of carrying out individual research projects. ***Prerequisites: Admittance to Community Psychology Program or permission of instructor.*** (3+0)

PSY F636 **Program Evaluation**
3 Credits Offered as Demand Warrants
Advanced introduction to theory, methods and techniques of program evaluation with specific relevance to conducting evaluations in Alaska. Papers, in-class exercises and discussions will cover all phases of program evaluation, including conceptualization, role of the evaluator, planning and implementing an evaluation, methodological and ethical issues, and analyzing and reporting results to stakeholders and participants. Emphasis on awareness of and sensitivity to potential cultural, class and gender differences in the evaluation process. ***Prerequisites: PSY F635 or comparable graduate level social science research methods course; admittance to Community Psychology Program; or permission of instructor.*** (3+0)

PSY F638 **Proseminar in Clinical, Community and Cultural Psychology**
1-3 Credits Offered as Demand Warrants
Topical seminar in an area of clinical, community and cultural psychology. Emphasis areas include rural Alaska, circumpolar, or indigenous psychology with one focus including integration across the sub-disciplines of clinical, community and cultural psychology. ***Prerequisites: Graduate standing; or permission of instructor.*** (1-3+0)

PSY F639 **Research Methods**
3 Credits Offered Spring
Methods used for research in community, clinical and cross-cultural settings. Introduces epistemologies and ethics relevant to research with rural and indigenous people. Includes a variety of designs and data-gathering methods to improve understanding of behavior in social settings. Quantitative, qualitative and mixed method approaches will be presented. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: Admittance to Psychology Ph.D. program or permission of instructor.*** (3+0)

PSY F644 **Advanced Multicultural Lifespan Development**
3 Credits
Advanced study of the cultural influences on human lifespan development with particular attention to the peoples and cultures of Alaska. Exploration of classical and contemporary research and theories. Emphasis on practical and professional applications. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

PSY F646 **School Counseling**
3 Credits Offered Fall
Topics related to the role of the school counselor such as consultation, career guidance, and culturally appropriate assessment. ***Prerequisites: Graduate standing or permission of instructor.*** Cross-listed with COUN F646. (3+3)

PSY F647 **Professional Ethics**
3 Credits Offered Fall
The ethical standards of the American Psychological Association and American Counseling Association will be examined, discussed and compared. Students will be provided with opportunities to apply these general principles to specific cases. Students will be expected to demonstrate a knowledge of the principles of these three ethical codes and an ability to apply them. Also available through the Center for Distance Education. ***Prerequisites: Admittance to Master's program in Psychology or Counseling, or permission of instructor.*** Cross-listed with COUN F647. (3+0)

PSY F650 **Cross-Cultural Psychopathology**
3 Credits Offered Fall
An overview of contemporary perspectives on child and adult psychological disorders from the perspective of cultural psychology. Fundamentals of therapeutic interviewing. Training in use of the DSM-IV diagnostic system. Examination of the role of culture, ethnicity, gender, and social class in symptom formation and the experience of illness, and critical examination of these issues in clinical application of the DSM-IV. Training in DSM-IV cultural formulation. ***Prerequisites: PSY F345 or equivalent; admittance to Counseling program; or permission of instructor.*** Cross-listed with COUN F650. (3+0)

PSY F652 **Practicum Placement — Clinical I**
1-3 Credits Offered Fall
Supervised clinical practicum experience in psychological interviewing, diagnosis and psychotherapy. Applied techniques focusing on delivery of clinical services in traditional or non-traditional clinical settings. Cultural factors are considered in each of these areas. ***Prerequisites: PSY F611; PSY F622; PSY F623; PSY F645; admittance to the Psychology Ph.D. program; or permission of instructor.*** (1-3+0)

PSY F653 **Practicum Placement — Clinical II**
1-3 Credits Offered Spring
Advanced clinical practicum experience designed to provide increased depth in applying theory to the practice and improving skills as a clinician. Covers application of psychological assessment principles. Impact of cultural factors continues as a major aspect of the practicum experience. ***Prerequisites: PSY F652; admittance to Psychology Ph.D. program; or permission of instructor.*** (1-3+0)

PSY F655 **Cross-Cultural Healing: Implications for Clinical/ Community Practice**
3 Credits Offered as Demand Warrants
A presentation of healing across a variety of cultures: Native American, Western, African, Polynesian and Oriental. The course will emphasize the preparation and education of healers, their roles and work, and integration within a community. Analyses and implications for the practice of preparation for community psychology roles will be stressed. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

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PSY F657 **Quantitative Analysis**
3 Credits Offered Fall
The underlying principles of statistics, including the logic of statistical inference, probability, power, effect size, and type one and two errors. Uses statistics for designs including the description of groups (data reduction), correlation, predictive models (regression), inferential statistics, analysis of mixed- method designs, and common nonparametric techniques. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: PSY F639; admittance to Psychology Ph.D. program; or permission of instructor.*** (3+0)

PSY F658 **Qualitative Analysis**
3 Credits Offered Fall
Introduction to the theory of qualitative inquiry, qualitative methodologies and basic techniques of qualitative research. Enables the student to use qualitative methods in research. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: PSY F639; graduate standing in Psychology; or permission of instructor.*** (3+0)

PSY F659 **Multivariate Statistics**
3 Credits
Provides a conceptual discussion of and statistical software training in advanced statistical analysis, including multivariate regression, canonical correlation, discriminant analysis, multivariate analysis of variance, principle component analysis, factor analysis, logistic regression, and cluster analysis. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: PSY F639; PSY F657; admittance to Psychology Ph.D. program; or permission of instructor.*** Cross-listed with COUN F623. (3+0)

PSY F660 **Counseling Theories and Applications I**
3 Credits Offered as Demand Warrants
A survey of the major theoretical systems of counseling and psychotherapy combined with a laboratory experience focused on building microskills in counseling. Specific application of theoretical principles will be investigated, analyzed and described. ***Prerequisites: Admittance to Counseling Program; or permission of instructor.*** Cross-listed with COUN F623. (3+2)

PSY F661 **Cross-Cultural Counseling**
3 Credits Offered Spring; As Demand Warrants
An examination of cultural and ethnic variables in human nature and their effect on the counseling process. Specific focus will be placed on the nature and function of culture, cultural variables in the context of the human experience, universal and culture-specific aspects of the counseling process, barriers to effective cross- cultural counseling, specific ethnic and cultural considerations, and methods of intellectual training with special emphasis on Alaskan applications. ***Prerequisites: Admittance to the Counseling program; or permission of instructor.*** Cross-listed with COUN F660. (3+0)

PSY F662 **Clinical Team/Practice**
3 Credits Offered as Demand Warrants
Increasing depth in applying theory to practice and improving skills as a therapist. Requires supervised clinical practice in psychotherapy with clients. Topics include ethics in counseling and psychotherapy practice, specific and non-specific factors in psychotherapy, goal setting and termination, managing transference and countertransference, treatment planning, and analysis and assessment of therapists understanding of therapeutic work and client progress. Cultural factors are considered in each of these issues. Supplement to PSY 660. ***Prerequisites: PSY F660; graduate standing in the Community Psychology program or permission of instructor.*** (3+0)

PSY F663 **Clinical Methods and Assessment**
3 Credits Offered as Demand Warrants
Fundamentals of therapeutic interviewing. Assessment of personality style and classification of psychopathology. Survey and practice with psychological tests. ***Prerequisites: Graduate standing in the Community Psychology program or permission of instructor.*** (3+0)

PSY F664 **Behavior Therapy**
3 Credits Offered as Demand Warrants
Behavior therapy and its associated techniques. The philosophical and scientific basis for behavior and therapy are studied, as well as specified procedures such as systematic desensitization, assertive training, behavior modification and others. Includes practice of techniques to gain facility with the skills involved. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

PSY F665 **Psychoanalytic Theory and Clinical Method**
3 Credits Offered as Demand Warrants
Psychoanalytic theory and the study of lives are presented to acquaint the student with the analysis of life histories or psychoanalytic perspective. Study of the therapeutic procedures of Freud, Jung, Searles, Sullivan, Lacan and object relations theorists. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

PSY F666 **Family and Network Therapy**
3 Credits Offered Spring
Survey of concepts and theories of function and dysfunction in the area of couples and families as social networks. Introduction to the skills necessary for intervention in these systems. ***Prerequisites: COUN F623; admittance to the Counseling program; or permission of instructor.*** Cross-listed with COUN F666. (3+0)

PSY F667 **Existential Psychotherapy**
3 Credits Offered as Demand Warrants
Focus on ultimate concerns rooted in the individual's existence. Theoretical and therapeutic approaches to existential issues such as death, freedom, isolation/relationship, meaning/meaninglessness and suffering. Euro-American, Native American and Eastern concepts and practices are examined. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

PSY F669 **Health Psychology**
3 Credits Offered Fall
Scientific study of behaviors relating to health enhancement, disease and injury prevention, safety and rehabilitation. While mental health is included, the emphasis is on physical health. ***Prerequisites: Graduate standing or permission of instructor.*** Stacked with PSY F469. (3+0)

PSY F671 **Grant Writing**
3 Credits
Provides hands-on training in developing, writing and submitting grant proposals. Discusses components of the grant writing process with an emphasis on grant writing for nonprofits and public agencies. Emphasizes research grant writing, with a focus on NIH grant application and review processes and secondary attention to NSF process. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: PSY F639; graduate standing in Psychology or permission of instructor.*** (3+0)

PSY F672 **Practicum Placement — Community I**
3 Credits Offered Fall
Community practicum experience designed to provide increased depth in applying theory to practice and improving skills as a community psychologist. Impact of cultural factors will be a major aspect of the practicum experience. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. Students will also be under close supervision with a community organization. ***Prerequisites: Graduate standing in Psychology or permission of instructor.*** (3+0)

PSY F673 **Practicum Placement — Community II**
3 Credits Offered Spring
An advanced community practicum experience designed to provide increased depth in applying theory to practice and improving skills as a community psychologist. Impact of cultural factors will be a major aspect of the practicum experience. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance

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delivery. Students will also be under close supervision with a community organization. Second phase of PSY F672. ***Prerequisites: PSY F672; graduate standing in Psychology; or permission of instructor.*** (3+0)

PSY F674 **Group Counseling**
3 Credits Offered Spring, Alternate Summer
Kinds and types of groups with emphasis on methods, problems and skills needed in working with groups in a counseling situation. ***Prerequisites: COUN F623/PSY F660; admittance to the Counseling program; or permission of instructor.*** Cross-listed with COUN F674. (3+0)

PSY F677 **Psychological Assessment-Intelligence**
3 Credits Offered as Demand Warrants
Methods of psychological assessment concerning intelligence. Survey of the concept of intelligence and its many multicultural implications. Widely used intelligence assessment procedures will be examined with particular concern for minority issues and the concept of intelligence. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

PSY F678 **Multicultural Psychological Assessment**
3 Credits Offered as Demand Warrants
Introduction to administration, scoring and interpretation of selected intelligence and personality instruments for children and adults. Integration of test findings and report writing will be reviewed. Basic psychometric theory and test validity will be explored. A particular focus is multicultural assessment practice, with emphasis upon practice with Alaska Native people ***Prerequisites: Graduate standing in the Community Psychology Program or permission of instructor.*** (3+0)

PSY F679 **Multicultural Psychological Assessment I**
3 Credits Offered Spring
Introduces administration, scoring and interpretation of various intellectual and objective personality assessment instruments, as well as their psychometric properties, for children and adults. Emphasis on the meaningful integration of test results into a culturally sensitive assessment report. Highlights professional and ethical issues related to multicultural assessment practices emphasizing Alaska Natives. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: PSY F633; admittance to the Psychology Ph.D. program; or permission of instructor.*** (3+0)

PSY F681 **Substances of Abuse in Alaska**
1 Credit Offered Fall
Overview of the most prevalent substances of abuse in Alaska including physical, psychological, social and medical consequences of use and abuse. ***Prerequisites: Admittance into the Psychology Ph.D. program or permission of instructor. First in the sequence PSY F681, PSY F682, and PSY F683. For doctoral students in the program. In exceptional cases to students not in the doctoral program, but with appropriate background and training will be given special permission to take the course.*** (1+0)

PSY F682 **Substance Abuse Assessment and Treatment Planning**
1 Credit Offered Fall
Specialized tests, measurement and treatment planning for substance abuse. Emphasis on integrating results into culturally relevant treatment plans following the American Society for Addiction Medicine dimensional criteria. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: Admittance to Psychology Ph.D. program or permission of instructor. PSY F682 is the second in a continuing series that includes PSY F681 and PSY F683. For doctoral students in the program, it is to be taken as a series. In exceptional cases, students not in the doctoral program but with the appropriate background and training will be given special permission to take the course.*** (1+0)

PSY F683 **Clinical Interventions in Substance Abuse**
1 Credit Offered Fall
Conceptualizing substance abuse as a continuum from intervention to aftercare. Relevant evidence-based interventions and therapeutic communities are addressed within the context of rural Alaska Native communities. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. PSY F683 is the third in a continuing series that includes PSY F681 and PSY F682. For doctoral students in the program, it is to be taken as a series. In exceptional cases, students not in the doctoral program but with the appropriate background and training will be given special permission to take the course. ***Prerequisites: Admittance to the Psychology Ph.D. program or permission of instructor.*** (1+0)

PSY F684 **Clinical Supervision**
3 Credits
The clinical, ethical and cultural issues involved in supervision. Contemporary, empirically supported information regarding various approaches to supervision will be examined. Covers both the relationship inherent in clinical supervision and training in leadership and supervision of employees in other work settings. Course will be video-conferenced between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery. ***Prerequisites: PSY F639; admittance to Psychology Ph.D. program; or permission of instructor.*** (3+0)

PSY F686 **Predoctoral Internship**
6 Credits
Understanding and application of assessment and intervention techniques in diverse settings. Students are placed in clinical or community settings for 40 hours per week to apply and sharpen skills. Students work under a local supervisor who manages student caseloads and assignments in collaboration with the course instructor. Graded Pass/Fail. ***Approval contingent upon approval of Dissertation proposal and of DCT's (Directors of Clinical Training).*** (6+0)

PSY F687 **Multicultural Psychological Assessment II**
3 Credits
Advanced psychological assessment tools including interviews, projective techniques and neurocognitive assessment. Emphasis on the integration of cognitive personality and other test results derived from an assessment battery into a meaningful and culturally sensitive psychological assessment report. Course will be video-conference between UAA and UAF campuses. The course will make use of Blackboard and E-res to support distance delivery ***Prerequisites: PSY F679; admittance to Psychology Ph.D. program or permission of instructor.*** (3+0)

PSY F688 **Practicum in Community Psychology**
3 Credits Offered as Demand Warrants
Practicums provide for supervised experiences and weekly seminars with course instructor. The supervised experience will be at an agency that will provide direct and/or participant observation and interactions for the beginning counselor along with immediate feedback concerning the experience. The weekly seminars will cover actual and role-playing situations and skills appropriate to the specific practicum, i.e., alcohol or drug abuse, community, or clinical. ***Prerequisites: Graduate standing or permission of instructor.*** (2+7)

PSY F690 **Pre-Master's Internship in Community Psychology**
3-12 Credits Offered as Demand Warrants
Supervised practice experience in community and/or clinical psychology setting. Student spends 40 supervised clock hours for every credit. Internship may involve more than one site. Graded Pass/Fail. ***Prerequisites: Completed permission to enroll form and internship plan signed by program director.*** (0+40)

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RECREATION

RECR courses are available to all UAF students who meet stated prerequisites. Students with disabilities are encouraged to participate. Any students requiring special accommodations are asked to contact the department office as soon as possible.

RECR F110-F170 courses include instruction, practice and activity in physical activities, sports and dance. Courses may be taken for credit once. Courses are graded Pass/Fail.

RECR F110A **Beginning Swimming**
1 Credit Offered as Demand Warrants
Beginning level swimming skills, proper breathing techniques and beginning strokes. Emphasizes personal water safety. Graded Pass/Fail. (0+3)

RECR F110B **Intermediate Swimming**
1 Credit Offered as Demand Warrants
Intermediate-level swimming skills, proper breathing techniques and beginning strokes. Emphasizes personal water safety. Graded Pass/Fail. (0+3)

RECR F110C **Advanced Swimming**
1 Credit Offered as Demand Warrants
Advanced-level swimming skills, proper breathing techniques and beginning strokes. Emphasizes personal water safety. Graded Pass/Fail. (0+3)

RECR F110D **Conditioning Swimming**
1 Credit Offered as Demand Warrants
Covers proper warm-up and warm-down techniques, lap swim etiquette, and proper use of workout equipment. Graded Pass/Fail. (0+3)

RECR F110E **Beginning Scuba**
1 Credit Offered as Demand Warrants
Instruction and practice in beginning underwater aquatic activities. Graded Pass/Fail. (0+3)

RECR F110F **Intermediate Scuba**
1 Credit Offered as Demand Warrants
Instruction and practice in intermediate underwater aquatic activities. Graded Pass/Fail. (0+3)

RECR F110G **Aqua Aerobics**
1 Credit Offered as Demand Warrants
Instruction and practice in aqua aerobics. Graded Pass/Fail. (0+3)

RECR F110H **Aquatic Activities and Instruction**
1 Credit Offered as Demand Warrants
Instruction and practice in aquatic activities at beginning through advanced levels including (but not limited to) swimming, conditioning, aqua aerobics, water polo, springboard diving and synchronized swimming. Graded Pass/Fail. (0+3)

RECR F120A **Aerobics**
1 Credit Offered as Demand Warrants
Moderate to high impact dance routines set to music designed to increase cardiovascular strength, promote coordination, and increase overall body strength and flexibility. Graded Pass/Fail. (0+3)

RECR F120B **Low Impact Aerobics**
1 Credit Offered as Demand Warrants
Instruction and practice in low impact aerobics. Graded Pass/Fail. (0+3)

RECR F120C **Beginning Yoga**
1 Credit Offered as Demand Warrants
Beginning concepts and philosophy of yoga, breathing, postures, mediation, Sanskrit names of exercises, increased muscle tone and flexibility. Graded Pass/Fail. (0+3)

RECR F120D **Intermediate Yoga**
1 Credit Offered as Demand Warrants
Intermediate concepts and philosophy of yoga, breathing, postures, meditation, Sanskrit names of exercises, increased muscle tone and flexibility. Graded Pass/Fail. (0+3)

RECR F120E **Advanced Yoga**
1 Credit Offered as Demand Warrants
Advanced concepts and philosophy of yoga, breathing, postures, meditation, Sanskrit names of exercises, increased muscle tone and flexibility. Graded Pass/Fail. (0+3)

RECR F120F **Exercise And Fitness**
1 Credit Offered as Demand Warrants
Instruction and practice in activities at beginning through advanced levels including (but not limited to) multi-fitness conditioning, recreational fitness activities, running, cycling, walking, weight training, aerobics, power lifting, tai chi chuan and yoga. Graded Pass/Fail. (0+3)

RECR F120G **Military Fitness Training**
1 Credit Offered as Demand Warrants
Instruction and practice in fitness activities concentrating on flexibility, strength, and muscular and cardiovascular endurance. Graded Pass/Fail. (0+3)

RECR F120H **Multi Fitness Conditioning**
1 Credit Offered as Demand Warrants
An overview of medium to high intensity aerobic exercise and muscle strengthening, conditioning and toning. Graded Pass/Fail. (0+3)

RECR F120J **Weight Training**
1 Credit Offered as Demand Warrants
Design and perform strength training routines using resistance to achieve overall fitness. Graded Pass/Fail. (0+3)

RECR F120K **Advanced Weight Training**
1 Credit Offered as Demand Warrants
Design and perform strength training routines using resistance to achieve overall fitness. Graded Pass/Fail. (0+3)

RECR F130A **Beginning Jazz Dance**
1 Credit Offered as Demand Warrants
Develop a repertoire of jazz dance movement and terminology including plies, isolations, stretches, traveling steps, battements, pas de burres, jazz slides and turns. History of jazz dance. Graded Pass/Fail. Cross-listed with THR F130A. (0+3)

RECR F130B **Intermediate Jazz Dance**
1 Credit Offered as Demand Warrants
Develop a repertoire of jazz dance movement and terminology including plies, isolations, stretches, traveling steps, battements, pas de burres, jazz slides and turns. History of jazz dance. Graded Pass/Fail. Cross-listed with THR F130B. (0+3)

RECR F130C **Advanced Jazz Dance**
1 Credit Offered as Demand Warrants
Develop a repertoire of a jazz dance movement and terminology including plies, isolations, stretches, traveling steps, battements, pas de burres, jazz slides and turns. History of jazz dance. Graded Pass/Fail. Cross-listed with THR F130C. (0+3)

RECR F130D **Modern Dance**
1 Credit Offered as Demand Warrants
Develop a repertoire of modern dance movement and terminology including contraction and release, swings, triplets, fall and recovery, rolls and improvisations. Graded Pass/Fail. Cross-listed with THR F130D. (0+3)

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RECR F130E **Beginning Ballroom Dance**
1 Credit Offered as Demand Warrants
Students with little or no background in social dance. Our aim is to have a good time and build a strong foundation for future learning. Dances covered include waltz, foxtrot, single-count swing, east coast swing, salsa, cha cha, merengue and, time permitting, polka. Graded Pass/Fail. Cross-listed with THR F130E. (0+3)

RECR F130F **Intermediate Ballroom Dance**
1 Credit Offered as Demand Warrants
Dances covered include waltz, foxtrot, single-count swing, east coast swing, salsa, cha cha, merengue and, time permitting, polka. Our aim is to have a good time and build a strong foundation for future learning. This course is for students with a beginning background in social dance. Graded Pass/Fail. Cross-listed with THR F130F. (0+3)

RECR F130G **Advanced Ballroom Dance**
1 Credit Offered as Demand Warrants
Dances covered include waltz, foxtrot, single-count swing, east coast swing, salsa, cha cha, merengue and, time permitting, polka. Our aim is to have a good time and build an even stronger foundation for future learning. This course is for students with an intermediate background in social dance. Graded Pass/Fail. Cross-listed with THR F130G. (0+3)

RECR F130H **Beginning Ballet**
1 Credit Offered as Demand Warrants
Instruction and practice in ballet at beginning levels. Graded Pass/Fail. Cross-listed with THR F130H. (0+3)

RECR F130J **Intermediate Ballet**
1 Credit Offered as Demand Warrants
Instruction and practice in ballet at intermediate levels. Graded Pass/Fail. Cross-listed with THR F130J. (0+3)

RECR F130K **Advanced Ballet**
1 Credit Offered as Demand Warrants
Instruction and practice in ballet at advanced levels. Graded Pass/Fail. Cross-listed with THR F130K. (0+3)

RECR F130L **Square Dance**
1 Credit Offered as Demand Warrants
Instruction and practice in square dance. Graded Pass/Fail. Cross-listed with THR F130L. (0+3)

RECR F130M **Round Dance**
1 Credit Offered as Demand Warrants
Instruction and practice in round dances. Graded Pass/Fail. Cross-listed with THR F130M. (0+3)

RECR F130N **Middle Eastern Dance**
1 Credit Offered as Demand Warrants
Designed for students with some or no background in Middle Eastern dance or anyone who wants to refine their technique and gain a deeper understanding of the different styles, history and evolution of Middle Eastern dance from social dance to performance art. Majority of semester will focus on basic dance vocabulary and choreography as well as dancing with props such as veils and finger cymbals. Graded Pass/Fail. Cross-listed with THR F130N. (0+3)

RECR F130Q **Beginning Hip Hop**
1 Credit Offered as Demand Warrants
Introduction to basic movements and terminology of hip hop dances and associated body movements. Students will gain these principles and ability to execute maneuvers presented in class. Graded Pass/Fail. Cross-listed with THR F130Q. (0+3)

RECR F140A **Beginning Fencing**
1 Credit Offered as Demand Warrants
Beginning classical Italian style fencing, stresses form and bladework for both defense and offense. This style is difficult to learn, but when mastered is extremely effective. Graded Pass/Fail. Special fees apply. (0+3)

RECR F140B **Intermediate Fencing**
1 Credit Offered as Demand Warrants
Intermediate classical Italian style fencing, stresses form and bladework for both defense and offense. This style is difficult to learn, but when mastered is extremely effective. Graded Pass/Fail. Special fees apply. (0+3)

RECR F140C **Advanced Fencing**
1 Credit Offered as Demand Warrants
Advanced classical Italian style fencing stresses form and bladework for both defense and offense. This style is difficult to learn, but when mastered is extremely effective. Graded Pass/Fail. Special fees apply. (0+3)

RECR F140D **EPCE Sabre Fencing**
1 Credit Offered as Demand Warrants
Instruction and practice activities in EPCE sabre fencing. Graded Pass/Fail. Special fees apply. (0+3)

RECR F140E **Beginning Pistol Marksmanship**
1 Credit Offered as Demand Warrants
Knowledge, skills and attitudes necessary for owning and using a pistol safely and to advance through the NRA marksmanship program. Pistol parts, operation, ammunition, gun safety, and shooting fundamentals. Safety will be the foremost concern. Graded Pass/Fail. Special fees apply. (0+3)

RECR F140F **Intermediate Pistol Marksmanship**
1 Credit Offered as Demand Warrants
Intermediate knowledge, skills and attitudes necessary for owning and using a pistol safely and to advance through the NRA marksmanship program. Pistol parts and their operation, ammunition, gun safety, and shooting fundamentals. Safety will be the foremost concern. Graded Pass/Fail. (0+3)

RECR F140G **Advanced Pistol Marksmanship**
1 Credit Offered as Demand Warrants
Advanced knowledge, skills and attitudes necessary for owning and using a pistol safely and to advance through the NRA marksmanship program. Pistol parts and their operation, ammunition, gun safety, and shooting fundamentals. Safety will be the foremost concern. Graded Pass/Fail. Special fees apply. (0+3)

RECR F140H **Beginning Rock Climbing**
1 Credit Offered as Demand Warrants
Introduction to rock climbing, knots, risk evaluation, gear, rope skills, belaying, rappelling, jumaring, prusiking and top rope techniques. Graded Pass/Fail. Special fees apply. (0+3)

RECR F140J **Intermediate Rock Climbing**
1 Credit Offered as Demand Warrants
Intermediate rock climbing, knots, risk evaluation, gear, rope skills, belaying, rappelling, jumaring, prusiking and top rope techniques. Graded Pass/Fail. (0+3)

RECR F140K **Advanced Rock Climbing**
1 Credit Offered as Demand Warrants
An extension of beginning rock climbing. Hauling, aid climbing, advanced Jumar techniques, lead climbing, porta-ledge set up and taping. Graded Pass/Fail. Special fees apply. (0+3)

RECR F140L **Technical Climbing**
1 Credit Offered as Demand Warrants
Introduction to high-angle technical climbing, top-rope rock and ice skills, movement on rock and ice, rope work, anchor systems, climbing ethics. Graded Pass/Fail. Special fees apply. (0+3)

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RECR F140M **Intro to Fly Fishing and Fly Tying**
1 Credit Offered as Demand Warrants
Stream, river, pond, and lake dynamics; fish anatomy, behavior, and life history; aquatic insects; and habitat and species of fish and insects; correlate limnology to fly selection and fishing strategy. Fall Fly Fishing: Interior Alaska limnology, entomology, and how they relate to fly-fishing. Fly-fishing as a medium to present college-level scientific concepts to students. Spring Fly Fishing: The art and science of fly casting, fishing and tying. Graded Pass/Fail. Special fees apply. (0+3)

RECR F140N **Alaskan Fly Fishing and Tying**
1 Credit Offered as Demand Warrants
The art and science of fly casting, fishing and tying. Graded Pass/Fail. Special fees apply. (0+3)

RECR F140O **Advanced Fly Fishing and Fly Tying**
1 Credit Offered as Demand Warrants
The art and science of advanced fly casting, fishing and tying. Graded Pass/Fail. (0+3)

RECR F140P **Table Tennis**
1 Credit Offered as Demand Warrants
Instruction and practice activities in table tennis. Graded Pass/Fail. (0+3)

RECR F140Q **Tennis**
1 Credit Offered as Demand Warrants
Instruction and practice activities in tennis. Graded Pass/Fail. (0+3)

RECR F140R **Billiards**
1 Credit Offered as Demand Warrants
Basic billiards skill set, strokes and using "English" on the cue ball. Focus on cutthroat, eight ball and nine ball using BCA rules. Graded Pass/Fail. (0+3)

RECR F140S **Badminton**
1 Credit Offered as Demand Warrants
Instruction and practice activities in badminton. Graded Pass/Fail. (0+3)

RECR F140T **Beginning Golf**
1 Credit Offered as Demand Warrants
Instruction and practice activities at beginning golf. Graded Pass/Fail. (0+3)

RECR F140U **Intermediate Golf**
1 Credit Offered as Demand Warrants
Instruction and practice activities in intermediate golf. Graded Pass/Fail. (0+3)

RECR F140V **Bowling**
1 Credit
Instruction and practice activities in bowling. Graded Pass/Fail. (0+3)

RECR F140W **Advanced Golf**
1 Credit Offered as Demand Warrants
Instruction and practice activities in advanced golf. Graded Pass/Fail. (0+3)

RECR F140Y **Kayaking**
1 Credit Offered as Demand Warrants
Instruction and practice activities at beginning through advanced kayaking. Graded Pass/Fail. (0+3)

RECR F140Z **Canoeing**
1 Credit Offered as Demand Warrants
Instruction and practice activities at beginning through advanced canoeing. Graded Pass/Fail. (0+3)

RECR F150A **Beginning Aikido**
1 Credit Offered as Demand Warrants
Aikido is a modern Japanese martial art that teaches coordination of mind and body to develop calmness in action and the strongest human condition. Includes KI extension exercises, basic rolling and falling, KI testing, and basic arts of self defense. Graded Pass/Fail. (0+3)

RECR F150B **Intermediate Aikido**
1 Credit Offered as Demand Warrants
Concentrates on learning to lead the KI development exercises. Breathing, movement, visualization techniques and moving meditation to teach how mind and body are interconnected. Advanced variations of the six basic self defense arts, advanced rolling and falling, Jo kata and individual and paired Bokken movements. Graded Pass/Fail. (0+3)

RECR F150C **Advanced Aikido**
1 Credit Offered as Demand Warrants
Instruction and practice in martial arts and combative activities at beginning through advanced levels including (but not limited to) boxing, aikido, karate and tae kwon do. Graded Pass/Fail. (0+3)

RECR F150D **Beginning Karate**
1 Credit Offered as Demand Warrants
Introduction to Shotokan karate, learning basic blocks, kicks and punches and defenses moves. Kata and kumite introduced. History and philosophy discussed. Graded Pass/Fail. (0+3)

RECR F150E **Intermediate Karate**
1 Credit Offered as Demand Warrants
Instruction and practice in intermediate karate. Graded Pass/Fail. (0+3)

RECR F150F **Advanced Karate**
1 Credit Offered as Demand Warrants
Instruction and practice in advanced karate. Graded Pass/Fail. (0+3)

RECR F150G **Beginning Kung Fu/Jui Jitsu/Tae Kwon Do**
1 Credit Offered as Demand Warrants
Emphasis on technique and conditioning. Beginning stances and etiquette. The three basic katas. Partner work, training in stretching, conditioning, and breath control. Both self-defense and sporting applications. Course will cover the eight Kung Fu animal systems. Activities will include but are not limited to: warm-ups, stretching, kicking, punching, kata, and partner work. Graded Pass/Fail. (0+3)

RECR F150H **Intermediate Kung Fu/Jui Jitsu/Tae Kwon Do**
1 Credit Offered as Demand Warrants
Emphasis on technique and conditioning. Intermediate stances and etiquette will be covered, along with an understanding of intermediate techniques and some of their applications. Partner work will be taught, along with training in stretching, conditioning, and breath control. Both self-defense and sporting applications. Will cover the eight Kung Fu animal systems. Activities will include but are not limited to: warm-ups, stretching, kicking, punching, kata, and partner work. Graded Pass/Fail. (0+3)

RECR F150J **Advanced Kung Fu/Jui Jitsu/Tae Kwon Do**
1 Credit Offered as Demand Warrants
Instruction and practice in advanced movements, weapons and martial arts certificate promotions. Graded Pass/Fail. (0+3)

RECR F150K **Beginning Tai Chi**
1 Credit Offered as Demand Warrants
Instruction and practice in beginning tai chi. Graded Pass/Fail. (0+3)

RECR F150L **Intermediate Tai Chi**
1 Credit Offered as Demand Warrants
Instruction and practice in intermediate tai chi. Graded Pass/Fail. (0+3)

RECR F150M **Advanced Tai Chi**
1 Credit Offered as Demand Warrants
Instruction and practice in advanced tai chi. Graded Pass/Fail. (0+3)

RECR F160A **Soccer**
1 Credit Offered as Demand Warrants
Instruction and practice in soccer. Graded Pass/Fail. (0+3)

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RECR F160B **Varsity Athletics**
1 Credit Offered as Demand Warrants
Instruction and practice in varsity athletics. Graded Pass/Fail. (0+3)

RECR F160C **Ultimate Frisbee**
1 Credit Offered as Demand Warrants
Ultimate Frisbee, including catching and throwing the disc as well as both offensive and defensive strategies. Graded Pass/Fail. (0+3)

RECR F160D **Volleyball**
1 Credit Offered as Demand Warrants
Skills of volleyball, game rules, plays and terminology. Graded Pass/Fail. (0+3)

RECR F160E **Beginning Archery**
1 Credit Offered as Demand Warrants
Designed for the beginning through the intermediate archer. Use of re-curve or compound bows. Current Olympic-style shooting methods along with different styles of target and field archery. Graded Pass/Fail. Special fees apply. (0+3)

RECR F170A **Beginning Ice Hockey**
1 Credit Offered as Demand Warrants
Beginning skating, passing, shooting, and team play. Power play and penalty kill. Practice game situation plays: odd man rushes, below the goal line play, and positional play. The sport of ice hockey in a group environment. Graded Pass/Fail. (0+3)

RECR F170B **Intermediate Ice Hockey**
1 Credit Offered as Demand Warrants
Intermediate skating, passing, shooting, and team play. Power play and penalty kill. Practice game situation plays: odd man rushes, below the goal line play, and positional play. The sport of ice hockey in a group environment. Graded Pass/Fail. (0+3)

RECR F170C **Advanced Ice Hockey**
1 Credit Offered as Demand Warrants
Advanced skating, passing, shooting, and team play. Power play and penalty kill. Practice game situation plays: odd man rushes, below the goal line play, and positional play. The sport of ice hockey in a group environment. Graded Pass/Fail. (0+3)

RECR F170D **Beginning Cross-Country Skiing**
1 Credit Offered as Demand Warrants
Instruction and practice in beginning cross-country skiing. Graded Pass/Fail. (0+3)

RECR F170E **Intermediate Cross-Country Skiing**
1 Credit Offered as Demand Warrants
Instruction and practice in intermediate cross-country skiing. Graded Pass/Fail. (0+3)

RECR F170F **Advanced Cross-Country Skiing**
1 Credit Offered as Demand Warrants
Instruction and practice in advanced cross-country skiing. Graded Pass/Fail. (0+3)

RECR F170G **Introduction to Ski Mountaineering**
1 Credit Offered as Demand Warrants
Safe methods of winter travel in Alaska. Snowshoeing, skiing, gear and clothing, avalanche safety, climbing crevasse rescue skills, glaciers, winter camping skills, first aid. Graded Pass/Fail. (0+3)

RECR F170H **Beginning Ice Skating**
1 Credit Offered as Demand Warrants
Instruction and practice in beginning ice skating. Graded Pass/Fail. (0+3)

RECR F170J **Intermediate Ice Skating**
1 Credit Offered as Demand Warrants
Instruction and practice in intermediate ice skating. Graded Pass/Fail. (0+3)

RECR F170K **Advanced Ice Skating**
1 Credit Offered as Demand Warrants
Instruction and practice in advanced ice skating. Graded Pass/Fail. (0+3)

RECR F170L **Speed Skating**
1 Credit Offered as Demand Warrants
Instruction and practice in speed skating. Graded Pass/Fail. (0+3)

RECR F170M **Curling**
1 Credit Offered as Demand Warrants
Instruction and practice in curling. Graded Pass/Fail. (0+3)

RELIGION

RELG F205 **Introduction to the Bible** (h)
3 Credits Offered as Demand Warrants
A study of the Bible as literature of ancient Israel and the early Christian church. (3+0)

RELG F211 **Arctic Native Religion: Shamanism** (h)
2 Credits Offered as Demand Warrants
Basic principles and beliefs of shamanism with emphasis on North American and Arctic shamanism. Introduction to traditional functions of shamanism; past and present perceptions of shamanism. (2+0)

RELG F221 **Religions of the World** (h)
3 Credits Offered as Demand Warrants
A survey of the development of major religions of the Eastern and Western world including contemporary world religions. (3+0)

RURAL DEVELOPMENT

RD F100 **College Seminar**
1 Credit
Designed to serve as an academic, cultural, and social transition to the UAF campus. Through active learning RD F100 will provide an opportunity to develop skills and expertise that will lead to student success academically and in other areas of life, including decision-making, communication and overall personal development and growth. Students achieve and understand their responsibility for a successfully undergraduate coping with their personal transition to college life. Students will benefit from close interaction with instructors, as well as their peers, and will better understand their inherent value and the significant role they play in the university community. (1+0)

RD F110 **Alaska Native Claims Settlement Act: Land Claims in the 21st Century**
1 Credit Offered as Demand Warrants
Familiarize students with the land claims process and important Alaska Native Claims Settlement Act content, with focus on contemporary situations and explanation of land claims processes ongoing or recently completed in locations outside Alaska. (1.5+0)

RD F200 **Rural Development in the North** (s)
3 Credits Offered Fall
Examines sustainable community development efforts in Alaska and the circumpolar North. Provides an overview of community development processes and case studies with an emphasis on indigenous communities and peoples. (3+0)

RD F245 **Fisheries Development in Rural Alaska** (s)
3 Credits Offered as Demand Warrants
Introduction to fisheries development issues in rural Alaska communities, including basic concepts, strategies and contemporary cases. Topics include management of salmon and other fisheries, community development quotas

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and sustainable development efforts. Emphasis on environmental and cultural impacts of fisheries development. ***Prerequisites: ENGL F111X.*** (3+0)

RD F250 **Grant Writing for Community Development**
1-3 Credits Offered as Demand Warrants
Basic elements of grant proposals and processes of preparing proposals for governmental and private funding sources. Emphasis on applied skills through preparation of actual grant proposals. Graded Pass/Fail. ***Prerequisite: ENGL F111X or permission of instructor.*** (1-3+0)

RD F255 **Rural Alaska Land Issues** (s)
3 Credits Offered as Demand Warrants
Introduction to land and resource management issues affecting rural Alaska. Provides a history of aboriginal use and occupancy of land and an overview of land provisions in the Alaska Native Claims Settlement Act (ANCSA) and the Alaska National Interest Lands Conservation Act (ANILCA). Topics include using maps and land records, Native allotments, navigability, trespass and management of Native lands. (3+0)

RD F265 **Perspectives on Subsistence in Alaska**
3 Credits Offered as Demand Warrants
The socioeconomic, cultural, legal and political dimensions of subsistence in Alaska. (3+0)

RD F268 **Rural Tourism: Planning and Principles**
1-3 Credits Offered as Demand Warrants
Introduction to rural tourism planning and principles. Students examine rural tourism attractions and trends, tourism planning and policy formation, quality standards, and cultural and environmental impacts of tourism. Cross-listed with ABUS F268. (1-3+0)

RD F280 **Resource Management Research Techniques**
3 Credits Offered as Demand Warrants
Overview of standard methods of field-based scientific research conducted by resource management agencies in rural Alaska including elementary statistical concepts, survey techniques and tools used in land and renewable resources research. ***Prerequisites: NRM F101 and BIOL F104X.*** (3+0)

RD F300 W **Rural Development in a Global Perspective** (s)
3 Credits Offered Fall
Relationship between rural communities and the global economy, with an emphasis on sustainable development. Highlights the multiple meanings of "development" and issues of population growth, environmental change, gender and indigenous peoples as they relate to rural development. Includes an introduction to the basic concepts and theories of development. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; junior standing; or permission of instructor.*** (3+0)

RD F315 **Tribal People and Development** (s)
3 Credits Offered Spring Odd-numbered Years
Comparative examination of socioeconomic development processes on tribal peoples in third and fourth world societies. Attention to implications of these processes for Alaska Native people. ***Prerequisites: Junior standing or permission of instructor.*** Cross-listed with ANS F315. (3+0)

RD F325 **Community Development Strategies** (s)
3 Credits Offered Fall
Principles and strategies of asset-based development in rural communities throughout the world. Explores the history of community development ideas and case studies of specific strategies in Alaska and beyond. Topics include community healing, economic renewal and collaborative decision-making approaches. (3+0)

RD F350 O **Community Research in Indigenous Contexts**
3 Credits Offered Fall
Community research approaches and techniques. Emphasis on the role and need for community-based research and ethical issues associated with it. Students use a hands-on approach to learn about oral history documentation, surveys of community assets and needs, and basic community survey techniques. ***Prerequisites: COMM F131X or COMM F141X.*** (3+0)

RD F351 **Strategic Planning for Rural Communities**
3 Credits Offered Spring
Examination of the major components of planning and grant writing processes as they relate to community land use, business and social service projects. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

RD F352 **Rural Business Planning and Proposal Development**
3 Credits Offered Spring
Provides undergraduate students with an understanding of the principles and processes involved in strategic planning, business planning and proposal development with the focus on applications in rural Alaska. Focus is on meeting the unique planning needs of rural Alaska communities and organizations. (3+0)

RD F400 **Rural Development Internship**
3 Credits
Structured experience in an appropriate agency or corporate setting. Student and instructor work collaboratively to identify appropriate internship. Designed primarily for students with limited managerial experience. Approved project required. Enrollment only by prior arrangement with the instructor. (3+0)

RD F401 **Cultural Knowledge of Native Elders** (h)
3 Credits Offered Fall
Study with prominent Native tradition-bearers in Native philosophies, values and oral traditions. Traditional knowledge elicited through the cultural heritage documentation process. Analysis of existing interactions between cultural traditions and contemporary American life as experienced by Native elders. Cross-listed with ANS F401. (3+0)

RD F425 **Cultural Resource Issues** (s)
3 Credits Offered as Demand Warrants
An examination of the potential impacts of development projects on cultural systems. Explores data gathering, analytical techniques and use of impact data. ***Prerequisites: Junior standing or permission of instructor.*** (3+0)

RD F427 **Tribal Contracting and Compacting**
3 Credits Offered as Demand Warrants
Examines the history of federal Indian policy that led to self-determination tribal contracting and compacting. Public Law 93-638 will be studied and analyzed. Challenging issues that hampered tribal contracting will be identified. Case studies involving both tribal organizations and tribal governments will be studied. Current issues, such as the proposed regionalization of tribes for the purpose of contracting and compacting, will be examined. (3+0)

RD F430 **Indigenous Economic Development and Entrepreneurship**
3 Credits Offered as Demand Warrants
An understanding of the principles, strategies and practices of economic development and entrepreneurship with a focus on indigenous Alaska communities. Focus is on those sustainable economics, through culturally appropriate practices. (3+0)

RD F450 **Managing Rural Projects and Programs**
3 Credits Offered Fall
Examines appropriate management and accountability approaches for community-based programs and projects, particularly those found in rural and/or cross-cultural contexts. ***Prerequisites: RD F350 and RD F351 or permission of instructor.*** (3+0)

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RD F451 **Human Resource Management for Indigenous Communities**
3 Credits Offered Fall
Provides an understanding of the principles and processes involved in human resource management especially as they apply within indigenous communities. Focus is on the relevance of human resource management in every unit, project or team, and on the unique human resource management needs of rural Alaska communities and organizations and how they can be met. (3+0)

RD F460 **Women and Development** (s)
3 Credits Offered as Demand Warrants
The effect of modernization and development processes on the role of women in a variety of Third World and tribal world contexts as well as the increasingly important "new" role women play in these complex processes. Cross-listed with WMS F460. (3+0)

RD F462 **Rural Health and Human Service Systems**
3 Credits Offered as Demand Warrants
Examine U.S. federal and state rural health and human service systems with specific emphasis on the tribal system in Alaska. The history, organization, work force, service delivery and financing of the U.S. and Canadian and Alaska systems are examined. Circumpolar challenges and policy issues in rural health and human service systems are explored. (3+0)

RD F465 **Community Healing and Wellness**
3 Credits Offered Fall
The history of education and the impact of religion and assimilation policies on the emotional and physical health of Alaska Natives and their communities. Traditional wellness issues and systems will also be researched from a global perspective. ***Prerequisite: Junior standing or permission of instructor.*** (3+0)

RD F475 W **Rural Development Senior Project**
3 Credits
Under faculty supervision, the student will complete a major theoretical, research and/or applied project which relates the student's applied emphasis area. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; senior standing; or permission of instructor.*** (3+0)

RD F492 **Rural Development Leadership Seminar**
1-3 Credits
Various topics of current interest and importance to the rural development majors. Topics announced prior to each offering. The course may be repeated for credit. Enrollment priority given to rural development majors. (1-3+0)

RD F600 **Circumpolar Indigenous Leadership Symposium**
3 Credits Offered Fall
Intensive face-to-face graduate seminar over a week-long period. Held every fall either in Fairbanks or Anchorage. This is a cornerstone course for all M.A. students in the program. The content focuses on indigenous leadership and includes presentations by practitioners from throughout Alaska and the circumpolar North. It also presents an orientation in depth to the graduate program. This course may be repeated once for elective credit. ***Prerequisites: Graduate standing or permission of instructor. Note: RD F600 is required of all graduate students in the Rural Development program. May be repeated once for credit.*** (3+0)

RD F601 **Political Economy of the Circumpolar North**
3 Credits Offered Fall
Interrelationships among rural communities in the circumpolar North and global socioeconomic, political and ecological systems. Includes major theoretical advances in our understanding of development in the 20th century. Uses a comparative case study approach to understand rapid socioeconomically and cultural change in the north. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

RD F608 **Indigenous Knowledge Systems**
3 Credits Offered Fall
A comparative survey and analysis of the epistemological properties, world views and modes of transmission associated with various indigenous knowledge systems. Emphasis on knowledge systems practiced in Alaska. ***Prerequisites: Graduate standing or approval of instructor.*** Cross-listed with CCS F608; ED F608; ANL F608. (3+0)

RD F612 **Traditional Ecological Knowledge**
3 Credits Offered Spring
Examines the acquisition and utilization of knowledge associated with long-term inhabitation of particular ecological systems and adaptations that arise from the accumulation of such knowledge. Attention will be given to the contemporary significance of traditional ecological knowledge as a complement to academic fields of study. ***Prerequisites: Graduate standing or approval of the instructor.*** Cross-listed with CCS F612. (3+0)

RD F625 **Community Development Strategies: Principles and Practices**
3 Credits Offered Spring
Provides graduate students with a detailed overview of principles and strategies of community development in rural Alaska and throughout the circumpolar North. Through in-depth case studies, it expands on materials and topics covered in Rural Development undergraduate courses on community development to explore how rural communities in diverse cultural, political and economic setting can build on local assets, skills and capacities to improve the lives of indigenous and other Northern residents. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

RD F650 **Community-Based Research Methods**
3 Credits Offered Spring
This graduate course provides students with opportunities for advanced exploration of community-based research principles and practices. In the course, emphasis is placed on developing a thorough understanding of the community research process from conceptualization to implementation and evaluation. It includes skill development of skills applicable to both quantitative and qualitative research. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

RD F651 **Management Strategies for Rural Development**
3 Credits Offered Spring
Provides an overview of the management by change and development within indigenous communities in the Circumpolar North. Looks closely at recent management strategies implemented in Alaska such as co-management of renewable resources, land management of Alaska Native corporations, cultural resource management, and the management of Alaska Native tribal governments, corporations and other organizations. Uses comparative case studies and effects of cultural and traditional values on management practices in different northern socio-cultural environments. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

RD F652 **Indigenous Organization Management**
3 Credits Offered as Demand Warrants
Purposes, structure and methods of management of particularly Northern indigenous organizations. The management of Alaska Native organizations will be compared with formal organizations established by indigenous peoples in other regions of the Circumpolar North. The concept of 'indigenous management' will be reviewed, as will perceptions of differences between leadership and management in both western and indigenous settings. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

RD F655 **Circumpolar Health Issues**
3 Credits Offered as Demand Warrants
Provides a comprehensive overview of major circumpolar health issues affecting Northern residents. Includes an analysis of health and traditional healing practices prior to contact. Examines the emergence of chronic diseases, problems of alcohol abuse and violence, efforts to combine traditional healing practices and Western medicine. Includes environmental health issues, including

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water, sewer, and food contamination. Overview of health care systems and public health infrastructure in the North. ***Prerequisites: Graduate standing or permission of instructor.*** (3+0)

RD F690 **Seminar in Cross-Cultural Studies**
3 Credits Offered as Demand Warrants
Investigation of current issues in cross-cultural contexts. Opportunity for students to synthesize their prior graduate studies and research. Seminar is taken near the terminus of a graduate program. ***Prerequisites: Advancement to candidacy and permission of student's graduate committee.*** Cross-listed with CCS F690; ED F690; ANL F690. (3+0)

RURAL HUMAN SERVICES

RHS F110 **Cross-Cultural Bridging Skills**
1 Credit Offered as Demand Warrants
Issues and impacts relevant to effective cross- cultural communication. Understanding barriers to effective cross-cultural communication in rural settings and development of effective cross-cultural communication skills from a Native perspective. Development of bridging and networking skills that integrate Native values and principles. Student must spend one week in intensive study at selected delivery site. (1+0)

RHS F115 **Issues of Personal Development**
2 Credits
Dynamics and impacts of personal development issues relevant to the delivery of rural human services focusing on understanding types, application and processes of personal development. Facilitating personal development through processes that integrate or reflect Native values and principles. Student must spend one week in intensive study at selected delivery site. (2+1)

RHS F120 **Family Systems I**
2 Credits
Survey of historical forces that exerted influence on Alaska Native families, the impacts of those forces and discussion of their contemporary effects from a Native perspective. Focus on developing options and strategies for developing healthy Native families as the foundation for healthy Native communities. Emphasis on developing the understanding and skills necessary to facilitate development and maintenance of healthy families through healthy individuals. Student must spend one week in intensive study at selected delivery site. (2+1)

RHS F130 **Processes of Community Change**
2 Credits
Contemporary foundations of rural social development and relevant issues from a Native perspective. Developing the understanding and skills necessary for facilitating positive individual, family and community development based on an ecological systems approach. Emphasis on developing the skills necessary to identify, develop and mobilize individual, family and community resources in rural Native communities. Student must spend one week in intensive study at selected delivery site. (2+1)

RHS F140 **Alaska Native Values and Principles**
1 Credit
Traditional Native values and principles, their applicability to today's world and issues relevant to their integration into today's lifestyles. Developing understanding and skills necessary for facilitating formulation of positive world views within Native individuals, families and communities. Explores the role of spirituality in a variety of Alaska Native cultures. Student must spend three days in intensive study at selected delivery site. (1+0)

RHS F150 **Introduction to Rural Counseling**
2 Credits
Identification and examination of issues relevant to the delivery of rural counseling services focusing on developing the understanding and skills necessary for the effective delivery of rural counseling services. Opportunities for development of basic rural counseling skills with emphasis on integration of Native values and principles and exploring strategies that facilitate positive individual, family, and community growth and development through enhancement of healthy lifestyles in rural Native communities. Student must spend one week in intensive study at selected delivery site. (2+1)

RHS F220 **Family Systems II**
2 Credits
The dynamics and issues relevant to personal healing and recovery from a Native perspective focusing on developing the understanding and skills necessary to healing and recovery in Native individuals, families and communities. Emphasis on achieving healthy lifestyles through self-understanding based on truth, grieving and positive proactive repositioning. Student must spend one week in intensive study at selected delivery site. (2+1)

RHS F250 **Rural Counseling II**
2 Credits
Differences and similarities between Native and Western counseling skills. Issues relevant to the development and delivery of basic rural counseling skills and services. Focuses on identifying and building on individual, family and community strengths as the foundation for development of intervention strategies. Addresses the importance of integrating Native traditional values and principles into intervention strategies and service delivery. Emphasis on developing and enhancing basic rural counseling skills and short- and long-term intervention strategies. Student must spend one week in intensive study at selected delivery site. (2+1)

RHS F260 **Addictions: Intervention and Treatment**
2 Credits
Dynamics, issues, impacts, treatment options and intervention strategies relevant to behavioral and chemical addictions. Understanding addictive processes and developing treatment options and intervention strategies from a Native perspective. Emphasis on development of treatment options and intervention strategies that integrate Native values and principles. Student must spend one week in intensive study at selected delivery site. (2+1)

RHS F265 **Interpersonal Violence**
2 Credits Offered as Demand Warrants
Types, causes and impacts of interpersonal violence focusing on developing an understanding of interpersonal violence and development of treatment options and intervention strategies from a Native perspective. Emphasis on development of treatment options and intervention strategies that integrate Native values and principles. Student must spend one week in intensive study at selected delivery site. (2+1)

RHS F270 **Networking, Negotiating and Conflict Resolution**
2 Credits
The dynamics of networking, negotiation and conflict resolution from a Native perspective. Focusing on Alaska Native individuals, families and communities, identification, examination and discussion of issues relevant to developing effective communication skills. Emphasis on identifying and understanding issues impacting conflict resolution, focusing on developing and strengthening networking and negotiating skills relevant to the delivery of effective rural human service. Student must spend one week in intensive study at selected delivery site. (2+1)

RHS F275 **Introduction to Recovery and Mental Illness**
2 Credits Offered as Demand Warrants
Overview of mental illness and recovery issues. Emphasis on issues for practitioners in small, rural communities in Alaska. ***Prerequisites: RHS F150 or instructor permission. Recommended: RHS F250, RHS F115.*** (2+1)

RHS F285 **Case Management**
2 Credits
Identification and discussion of issues, components, procedures, responsibilities, skills and processes for case management in rural settings with diverse populations. Emphasis on case management processes unique to rural and village Alaska and to the fields of mental health, addictions and interpersonal violence. Oral and written communication skills essential to effective case

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management explored. Student must be willing and able to work independently outside the classroom and in the community. (2+1)

RHS F287 **Rural Human Services Practicum**
4 Credits
Personal and professional development, self-analysis and growth. Emphasis on developing the understanding and skills necessary to integrate Native healing theory and problem solving into the delivery of rural human services. Student must be willing and able to work independently outside the classroom and in the community. Taken as part of the final sequence of courses in the Rural Human Services certificate program, practicum provides students with 100 hours of supervised learning experience in an approved rural human service organization/agency. (4+0)

RHS F288 **Directed Study: Resource Assessment**
1 Credit
Identify and develop local, regional and statewide resources of benefit to the student's community. Focus on gathering information on resources and creating a human services resource directory relevant to the needs of individuals, families and communities. Emphasis on application of multicultural communication skills. Student must be willing and able to work independently outside the classroom and in the community. (1+0)

RHS F289 **Directed Study: Community Development**
1 Credit
Develop, implement and evaluate a village-based community development project through a supervised, professional experience. Focus on developing positive, effective, meaningful development projects that are culturally appropriate. Emphasis on developing a process that facilitates community ownership and responsibility for the project. Student must be willing and able to work independently outside the classroom and in the community. (1+0)

RHS F290 **Grief and Healing**
2 Credits Offered as Demand Warrants
Exploration of the dynamics of grief and healing from an Alaska Native perspective. Special emphasis on Native values and principles focused on developing culturally relevant, understandings, awarenesses and professional skills. (2+1)

RURAL NUTRITION SERVICES

RNS F101 **Rural Nutrition and Health Change**
1 Credit Offered as Demand Warrants
Introduction to healthful nutrition and tools for making health changes in a rural context. A beginning knowledge of healthy foods and activity for improved wellness outcomes. Skill development in meal planning, preparation and portioning, healthy meal makeovers, goal setting and maintenance. (14+0)

RNS F105 **Nutrition Science for the Generations**
3 Credits Offered as Demand Warrants
Basic applied nutrition science concepts in context of the life cycle presented in a culturally relevant framework. Introductory study of macro- and micronutrient requirements, food sources and physiologic and metabolic function with focus on relationship with health and change from traditional diets to contemporary Alaska Native diets. Overview of common nutritional problems affecting rural Alaskans. (0+0)

RNS F120 **Alaska Native Food Systems**
3 Credits Offered as Demand Warrants
A comprehensive overview of Alaska Native food systems including harvest methods, nutrient values, cultural, political and economic impacts and changing relationships (spiritual, personal, environmental, community and diet). Traditional common elements of regional diets and nutrients that support health are identified, compared and contrasted with modern diets. Current food system issues are addressed. ***Co-requisite: RNS F105 or permission of instructor.*** (0+0)

RNS F201 **Community Nutrition Interventions**
2 Credits Offered as Demand Warrants
Students learn a broad range of skills for leading culturally relevant nutrition outreach and extension interventions in rural Alaska with attention to learning styles, lesson planning, project design, media and delivery methods. Focus on addressing nutrition and lifestyle changes to promote wellness and prevent nutrition-related diseases. ***Prerequisites: RNS F105 or permission of instructor. Recommended: RNS F120.*** (0+0)

RNS F210 **Introduction to Rural Nutrition Counseling**
2 Credits Offered as Demand Warrants
Identification and exploration of issues relevant to rural nutrition counseling services with focus on development of understanding and skills necessary for the effective delivery of culturally competent services. Opportunities for development of basic rural nutrition counseling skills with emphasis on integration of Alaska Native values and principles; and strategies that facilitate positive individual, family and community wellness through healthy lifestyle choices. ***Prerequisites: RNS F105 or permission of instructor. Recommended: RNS F120.*** (0+0)

RNS F260 **Rural Nutrition Practicum**
2-3 Credits Offered as Demand Warrants
Provides students a supervised, community-based learning experience as they apply information from the RNS curriculum to nutrition outreach/extension. Focus is on the integration of nutrition science information with development of understanding and skills to provide culturally relevant community outreach/extension to rural Alaskan communities. ***Prerequisites: RNS F105. Co-requisite: RNS F201. Recommended: RNS F120.*** (0+0)

RUSSIAN

RUSS F100A **Elementary Russian 1A** (h)
3 Credits Offered Fall
An introductory course in the Russian language and culture with an emphasis on the spoken and written language. Does not meet Perspectives on the Human Condition requirements, or Foreign Language major or minor requirements. (3+0)

RUSS F100B **Elementary Russian 1B** (h)
3 Credits Offered Spring
An introductory course in the Russian language and culture with an emphasis on the spoken and written language. Does not meet Perspectives on the Human Condition requirements, or Foreign Language major or minor requirements. ***Prerequisites: RUSS F100A; or permission of instructor.*** (3+0)

RUSS F101 **Elementary Russian I** (h)
5 Credits Offered Fall
Introduction to language and culture: development of competence and performance in the language through understanding, recognition and use of linguistic structures; increasing emphasis on listening comprehension and speaking; basic vocabulary of approximately 750 words; exploration of the cultural dimension, implicitly through language, and explicitly through texts and audiovisual materials. (5+0)

RUSS F102 **Elementary Russian II** (h)
5 Credits Offered Spring
Introduction to language and culture: development of competence and performance in the language through understanding, recognition and use of linguistic structures; increasing emphasis on listening comprehension and speaking; basic vocabulary of approximately 750 words; exploration of the cultural dimension, implicitly through language, and explicitly through texts and audiovisual materials. ***Prerequisites: RUSS F101 or equivalent.*** (5+0)

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RUSS F103 **Conversational Russian I** (h)
3 Credits Offered Spring Odd-numbered Years
Verbal skills improvement. Vocabulary is presented to improve speaking on specific topics. Graded Pass/Fail. ***Prerequisites: RUSS F101 and RUSS F102 or above or permission of instructor. Note: Does not satisfy core curriculum or foreign language major requirements.*** (3+0)

RUSS F201 **Intermediate Russian I** (h)
4 Credits Offered Fall
Continuation of RUSS F102. Increasing emphasis on reading ability and cultural materials. Conducted in Russian. ***Prerequisites: RUSS F102 or two years of high school Russian.*** (4+0)

RUSS F202 **Intermediate Russian II** (h)
4 Credits Offered Spring
Continuation of RUSS F102. Increasing emphasis on reading ability and cultural materials. Conducted in Russian. ***Prerequisites: RUSS F201 or equivalent.*** (4+0)

RUSS F203 **Conversational Russian II** (h)
3 Credits Offered Spring Odd-numbered Years
Oral skills improvement. Vocabulary is presented to improve speaking on specific topics. Graded Pass/Fail. ***Prerequisites: RUSS F102 or above or permission of instructor. Does not satisfy core curriculum or foreign language major requirements.*** (3+0)

RUSS F301 W,O **Advanced Russian** (h)
3 Credits Offered Fall
Discussions and essays on more difficult subjects or texts. Translations, stylistic exercises and special grammatical problems. Conducted in Russian. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; RUSS F202; or instructor permission.*** (3+0)

RUSS F302 W,O **Advanced Russian** (h)
3 Credits Offered Spring
Discussions and essays on more difficult subjects or texts. Translations, stylistic exercises and special grammatical problems. Conducted in Russian. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; RUSS F301 or equivalent; or permission of instructor.*** (3+0)

RUSS F431 **Studies in Russian Culture** (h)
3 Credits Offered Fall Odd-numbered Years
Study of the cultures of the Russian-speaking world. May be repeated for credit if topic varies. ***Prerequisites: RUSS F301 or equivalent; junior standing or permission of instructor.*** (3+0)

RUSS F432 **Studies of Russian Literature** (h)
3 Credits Offered Spring Even-numbered Years
Intensive study of authors, literary texts, movements, genres, themes and/or critical approaches. May be repeated for credit when topics vary. ***Prerequisites: RUSS F302 or equivalent, and at least junior standing, or permission of instructor.*** (3+0)

RUSS F482 **Selected Topics in Russian Literature** (h)
3 Credits Offered Fall Even-numbered Years
Intensive course in literature focusing on nineteenth-century writers. Conducted in English. Note: Course may be repeated for credit if topic varies. ***Prerequisites: Junior standing, or permission of instructor.*** (3+0)

RUSS F484 **Russian and Soviet Cinema** (h)
3 Credits Offered Fall Odd-numbered Years
Study of Russian culture and society through the medium of film, focusing on the history of Russian cinema and genres. Films by award-winning directors. Designed to familiarize students with Russian history and culture from 1900s to the present. Readings and topics discussed reflect issues of current interest. Course may be repeated once. ***Prerequisites: Junior standing, or permission of instructor.*** (3+0)

RUSS F488 **Individual Study: Senior Project** (h)
3 Credits Offered as Demand Warrants
Analysis and presentation, in the language, of a problem chosen by the student in consultation with the department. The student must apply for senior project and submit a project outline by the end of the sixth week of the semester preceding the semester of graduation. Conducted in Russian. ***Prerequisites: At least 10 credits in upper division Russian or permission of instructor.*** (3+0)

SCIENCE APPLICATIONS

SCIA F100 **Introducing Astronomy**
1 Credit Offered as Demand Warrants
History of astronomy, the structure of the universe and its parts and the techniques used for studying the universe. Observation of celestial bodies with various optical instruments. (1+0)

SCIA F107 **Rock Identification**
1 Credit Offered as Demand Warrants
Physical properties of igneous, sedimentary and metamorphic rocks. Sight identification of rocks with emphasis on rocks found on the Seward Peninsula. (1+0)

SCIA F109 **Mineral Identification**
1 Credit Offered as Demand Warrants
Physical and field identifiable chemical properties of rocks and minerals. Emphasis on minerals found on the Seward Peninsula. (1+0)

SCIA F130 **Moose Ecology**
1 Credit Offered as Demand Warrants
Natural history of moose, the ecological concepts of energy flow, nutrient cycling, food webs and population dynamics. Attention to the Seward Peninsula moose population and factors used in making wildlife management decisions. (1+0)

SCIA F150 **Subarctic Horticulture**
1 Credit Offered as Demand Warrants
Soils, plant propagation, disease and insect control, variety selection, fertilization, greenhouse construction and care and gardening techniques. Emphasis on development and care of greenhouses and gardens in the Nome area. (0+3)

SCIA F157 **Alaska Plants**
1 Credit Offered as Demand Warrants
Introduction to the topics of plant taxonomy and identification with specific reference to common Alaskan plants and vegetation types. (1+0)

SCIA F161 **Birds of Alaska**
1 Credit Offered as Demand Warrants
Biology of birds including behavior, anatomy, physiology, ecology, systematics and field identification. (1+0)

SCIA F162 **Mammals of Alaska**
1 Credit Offered as Demand Warrants
Introduction to the mammals of Alaska and their importance to the local ecology and economy from a scientific research standpoint. Emphasis on important and/or common species for study of classification, habitat, life cycle and economic importance. ***Prerequisites: Background or interest in general science or natural history or permission of instructor.*** (1+0)

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SOCIAL WORK

SWK F103 **Introduction to Social Work** (s)
3 Credits
Introduction to the profession of social work and the human services delivery system. Examines historical development of social work focusing on the knowledge, values and skills that characterize the social worker. Orientation to the context for social work, including the diversity of human needs, human services, social policy and legislation. Services, programs, and career opportunities within rural and urban Alaska, as well as nationally, are discussed. (3+0)

SWK F220 **Ethics, Values and Social Work Practice** (s)
3 Credits
The professional nature and meaning of generalist social work practice. Examines the NASW code of ethics. Introduces interpersonal communication and interviewing. Assists students in making decisions about social work or other helping professions. ***Prerequisites: SWK F103 or permission of instructor.*** (3+0)

SWK F305 O **Social Welfare History** (s)
3 Credits Offered Fall
Analysis of social inequality and the U.S. social welfare system by tracing the historical development of government response to social inequality and exploring historical and persisting dilemmas in the provision of social welfare services. ***Prerequisites: COMM F131X or COMM F141X; SWK F103 or SOC/ANTH F100X.*** (3+0)

SWK F306 W **Social Welfare: Policies and Issues**
3 Credits Offered Spring
Social policies and how they effect the delivery of social services. Factors influencing development of the current social service system. Analysis of dilemmas which develop in a welfare system attempting to deal with rapid social change. Alternative approaches to the solution of social problems and possible future developments. ***Prerequisites: ANTH F100X or SOC F100X or SWK F103.*** (3+0)

SWK F310 **Fetal Alcohol Spectrum Disorders**
3 Credits Offered as Demand Warrants
An overview of fetal alcohol spectrum disorders with a particular focus on the needs, issues and programs specific to Alaska. (3+0)

SWK F320 W **Rural Social Work**
3 Credits Offered Spring
Preparation for practice in rural areas characterized by the need for multiple delivery systems, unique local customs and inadequate resources. Emphasis on preparation for practice nationally with unique features of Alaska incorporated at key points. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; SWK F103.*** (3+0)

SWK F330 **Seminar in International Social Work**
3 Credits Offered Fall
International issues related to social work practice and social welfare policy. The focus of the seminar will be on global and international issues related to social and economic justice, distributive justice, and human and civil rights. Specific content is announced at registration. Course may be repeated once for credit when content varies. ***Prerequisites: SWK F103 or permission of instructor.*** (3+0)

SWK F341 **Human Behavior in the Social Environment I** (s)
3 Credits Offered Fall
Theoretical frameworks for organizing knowledge about personality development, social behavior and the organization of groups and communities. An emphasis is placed on the bio-psycho-social perspective of human development from birth through adolescence. ***Prerequisites: PSY F101; SOC/ANTH F100X; SWK F103.*** (3+0)

SWK F342 O **Human Behavior in the Social Environment II**
3 Credits Offered Spring
Theoretical frameworks for organizing knowledge, personality development, social behavior and the organization of groups and communities. An emphasis is placed on the bio-psycho-social of human development young adulthood through later life. ***Prerequisites: PSY F101; SOC/ANTH F100X; SWK F103; social work major.*** (3+0)

SWK F350 W **Women's Issues in Social Welfare and Social Work Practices** (s)
3 Credits
Examination of theories and research concerning women's issues in the field of social work and in the social welfare system, with particular emphasis on women in poverty and women of color. Contemporary policy issues and strategies of empowerment will be covered. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; SWK F103 or SOC F100X; or permission of instructor.*** Cross-listed with WMS F350. (3+0)

SWK F360 **Child Abuse and Neglect**
3 Credits Offered Spring
Dynamics, implications and treatments of child abuse and neglect for individuals and families in rural and urban Alaska. ***Prerequisites: SWK F103 or permission of instructor.*** (3+0)

SWK F370 **Services and Support for an Aging Society** (s)
3 Credits Offered as Demand Warrants
An examination of the aging process, theories, political processes, social work generalist intervention and strategies and agency support for the aging population. The rapidly changing social and health issues of older adults are addressed in a multi-disciplinary and multi-cultural approach. (3+0)

SWK F375 W **Research Methods in Social Work**
3 Credits Offered Fall
Course has a two-fold objective: to help students become critical consumers of research in the social sciences and to allow students to carry out beginning research studies. Course sequentially covers phases of the research process, whether quantitative or qualitative. ***Prerequisites: ENGL 111X; ENGL F211X or ENGL 213X; SWK F103; or permission of instructor.*** (3+0)

SWK F440 **Social Work Practice with Military Families**
3 Credits
Explores the history and roles of social work with military families. Ethical concerns that emerge from social work practice with military families are addressed. Military social workers' roles in mental health programs, family advocacy, program administration, and policy making are examined. Addresses the issues that affect military families during times of deployment. ***Prerequisites: SWK F220; or permission of instructor.*** (3+0)

SWK F460 **Social Work Practice I**
3 Credits Offered Fall
Development of beginning skills in interviewing and helping processes with individuals, families and groups. Application of intervention strategies and techniques made to case materials, primarily in family and child welfare services. Contracting, case management and social brokerage. ***Prerequisites: Concurrent enrollment in SWK F461; Social Work major; senior standing.*** (3+0)

SWK F461 **Practicum in Social Work I**
3 or 6 Credits Offered Fall
Individual training and practice in a social service agency. Students signing up for 3 credits complete 100 hours; students signing up for 6 credits complete 200 hours of direct practice in an approved agency under the supervision of a field instructor. ***Prerequisites: Social Work major; senior standing; approval from practicum coordinator.*** (1+7 or 15)

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SWK F463 **Social Work Practice II**
3 Credits Offered Spring
Further development of student's knowledge of direct practice with clients and development of beginning skills in community work including social planning. Emphasis on aspects of rural practice such as use of community associations and the informal helping network. Taken concurrently with SWK F464. ***Prerequisites: Social work major, senior standing, and concurrent enrollment in SWK F464.*** (3+0)

SWK F464 **Practicum in Social Work II**
3 or 6 Credits
Continuation of SWK F461; further direct practice experience in an agency. Students signing up for 3 credits complete 100 hours; students signing up for 6 credits complete 200 hours of practice in an approved agency under the supervision of a field instructor. Taken concurrently with SWK F463. ***Prerequisites: SWK F460; SWK F461; Social Work major; senior standing.*** (1+7 or 15)

SWK F466 **Practicum in Social Work II**
3 or 6 Credits
Further direct practice experience in an approved agency under the supervision of a field instructor. Students enrolled in 3 credits must complete 100 hours of practicum. Students enrolled in 6 credits must complete 200 hours of practicum. ***Prerequisites: SWK F460; SWK F461; SWK F463; SWK F464; Social Work major; senior standing.*** (0+7 or 15)

SWK F470 **Substance Abuse Theories and Treatment** (s)
3 Credits Offered as Demand Warrants
Examination of research and theories of chemical dependency from a social work, systems/ecological framework. Critically examines current theory and practice in terms of effectiveness, cultural appropriateness and validity with vulnerable populations. ***Prerequisites: SWK F103 or permission of instructor.*** (3+0)

SWK F484 **Seminar in Social Work Practice Areas**
3 Credits Offered as Demand Warrants
Problem areas in social work. Topics vary in different semesters, content announced in class schedule prior to each semester. Course may be repeated for credit when topic varies. ***Prerequisites: SWK F103 or permission of instructor.*** (3+0)

SOCIOLOGY

SOC F100X **Individual, Society and Culture** (s)
3 Credits
An examination of the complex social arrangements guiding individual behavior and common human concerns in contrasting cultural contexts. Also available through the Center for Distance Education. ***Prerequisites: Placement in ENGL F111X or higher; or permission of instructor.*** (3+0)

SOC F201 **Social Problems** (s)
3 Credits Offered Fall
A study of major contemporary social problems, analysis of factors causing these problems. Emphasis on cross-cultural differences in Alaska and other parts of the world. (3+0)

SOC F202 **Sociology of Popular Culture** (s)
3 Credits Offered Spring Even-numbered Years
A critical examination of contemporary popular culture in sociological perspective. Introduces debates in the field of cultural sociology with special emphasis on the creation, distribution, consumption, and social impact of popular culture. Themes in course content will vary by semester including popular performances, leisure and entertainment, mass media, humor, food, and fashion. ***Recommended: SOC F100X.*** (3+0)

SOC F242 **The Family: A Cross-Cultural Perspective** (s)
3 Credits
Analysis of conceptual frameworks in family research, and a cross-cultural comparison of variations in family and kinship structures, both past and present. Examination of contemporary developments in family forms, the dynamic roles and patterns of relationships, and links with other social institutions. Emphasis on how social forces such as gender, race, ethnicity and social class shape the family and experiences of family life. Also available through the Center for Distance Education. ***Prerequisites: SOC F100X or permission of instructor.*** (3+0)

SOC F250 **Introductory Statistics for Behavioral Sciences**
3 Credits Offered Spring
Statistics applied to social scientific topics. Includes descriptive statistics, frequency distributions, sampling distributions, elementary probability, estimation of population parameters, hypothesis testing (one and two sample problems), correlation, simple linear regression and one-way analysis of variance. Also available through the Center for Distance Education. ***Prerequisites: MATH F107X or MATH F103X or MATH F200X.*** Cross-listed with PSY F250. (3+0)

SOC F263 **Social Inequality and Stratification** (s)
3 Credits Offered Spring
Comprehensive analysis of current sociological debates and diverse theoretical approaches used to address social stratification and inequality. Examines the various dimensions of inequality, including those related to race, class and gender at the local, national and global levels. ***Prerequisites: SOC F100X and SOC F201 or permission of instructor.*** (3+0)

SOC F301 **Rural Sociology** (s)
3 Credits Offered as Demand Warrants
Analysis of sociological issues using rural communities and rurality as examples. Emphasis on issues of social justice and inequality. Part of focus is on rural communities of Alaska and the North. ***Prerequisites: One lower division social science course.*** (3+0)

SOC F303 **Early Sociological Thought** (s)
3 Credits Offered Spring
The major sociological theories of the classical period (19th and early 20th centuries) that have influenced contemporary sociology. ***Prerequisites: SOC F100X; SOC F201; SOC F263.*** (3+0)

SOC F308 **Race and Ethnic Relations** (s)
3 Credits Offered Fall
A sociological analysis of the principles and processes that shape relationships among racial and ethnic groups in Alaska, the U.S. and elsewhere in the world. Focus on the relations among dominant and subordinate groups in these societies, using sociological theory to understand the structural factors that shape intergroup relations. ***Prerequisites: SOC F100X; SOC F201; SOC F263.*** (3+0)

SOC F309 **Urban Sociology** (s)
3 Credits Offered as Demand Warrants
Origin and development of urban society as an industrial-ecological phenomenon; the trends of migration and metropolitanism with futuristic implications; and the rural-urban dichotomy in the Alaskan context. (3+0)

SOC F310 **Sociology of Aging** (s)
3 Credits
A sociological analysis of the process of aging in the U.S., Alaska and globally, with special attention on structural inequality and social justice issues. Also available through the Center for Distance Education. ***Prerequisites: SOC F100X, SOC F201, and SOC F263.*** (3+0)

SOC F320 **Sociology of Gender** (s)
3 Credits
Comprehensive survey of sociological inquiry and feminist revisions for studying gender in U.S. society and culture. Interrogates the meanings of gender and the interactional, cultural, organizational and institutional arrangements that underlie the social construction of gender and gender inequality. ***Prerequisites:***

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One lower-division social science course; WMS F201; or permission of instructor. Cross-listed with WMS F320. (3+0)

SOC F330 **Social Psychology** (s)
3 Credits Offered Spring
Analysis of intergroup relationships in terms of process and value orientation, their influences on the personality, and aspects of collective behavior on group and person. Aspects of social interaction that have cultural and intercultural variation. ***Prerequisites: PSY F101 or SOC F100X.*** Cross-listed with PSY F330. (3+0)

SOC F333 **Human Sexualities Across Cultures** (s)
3 Credits Offered Alternate Fall Odd-numbered Years
Exploration of how people in a variety of cultures, both contemporary and historical, construct the meaning and experience of sexuality, and express themselves as sexual beings. Interdisciplinary study includes psychology, sociology, anthropology, gender studies, and related fields, with particular focus determined by which department is offering the course. Also available through the Center for Distance Education. ***Prerequisites: SOC F100X or SOC F201 or PSY F101 or WMS F201 or permission of instructor.*** Cross-listed with PSY F333; WMS F332. (3+0)

SOC F335 **Deviance and Social Control** (s)
3 Credits Offered Fall Odd-numbered Years
Analysis of classical and contemporary theoretical perspectives used to understand, explain and control criminal and non-criminal forms of deviance. Emphasis on the social dimensions of the creation of deviant categories and persons, the consequence of societal reactions to selected forms of deviance, and implications for social policy (prevention) and social control (corrections). ***Prerequisites: SOC F100X; SOC F201; or permission of instructor.*** (3+0)

SOC F345 **Sociology of Education** (s)
3 Credits Offered Fall Odd-numbered Years
Theoretical perspectives on various dimensions of the relationship between education and society, including the institutional context of schooling, the impact of schooling on social stratification, and social organization within the school and classroom. Special attention is given to issues of equity and contemporary educational reform efforts. ***Prerequisites: SOC F100X or permission of instructor.*** Cross-listed with ED F345. (3+0)

SOC F350 W **Sociology of Childhood** (s)
3 Credits Offered Fall Even-numbered Years
Concepts, theories and empirical research in the sociology of childhood. Broad themes include social structure and its consequences for children's lives, children's agencies, and the diversity of childhood experiences. Includes an overview of the problems children face, and recommendations for solutions. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** (3+0)

SOC F373 W **Research Methods in the Social Sciences** (s)
3 Credits Offered Fall
Course helps students become critical consumers of research in the social sciences and enables them to develop research proposals. The course covers phases of the research process, which comprises problem formulation, research designs, conceptualization, sampling and ethical issues. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; SOC F100X; SOC F201; SOC F263.*** (3+0)

SOC F405 O **Social Movements and Social Change** (s)
3 Credits
Focus on collective behavior, social change and social movements at the local, national and global levels. Analysis will include historical, technological and legal implications of large-scale social change. ***Prerequisites: COMM F131X or COMM F141X; SOC F100X; SOC F201; SOC F263 and 3 credits of SOC at F300-level; or permission of instructor.*** (3+0)

SOC F407 O **Work and Occupations** (s)
3 Credits Offered as Demand Warrants
The sociology of work and occupations. Local, regional, national and global industries, work sites and workers will be examined, using sociological theories and concepts. Analysis includes structural issues of inequality in employment practices and work sites. ***Prerequisite: COMM F131X or COMM F141X; SOC F100X; SOC F201; SOC F263; 3 credits in SOC at the F300-level.*** (3+0)

SOC F435 **Sociology of Law** (s)
3 Credits
Addresses the social nature of legal decision-making, the social context of law and the reciprocal relations between law, society and justice. Explores how race, class and gender are implicated in the law, and the role of law in social control, in social change and in our everyday lives. ***Prerequisites: SOC F100X; junior standing; or permission of instructor. Recommended: SOC F303.*** (3+0)

SOC F440 O **Environmental Sociology** (s)
3 Credits
Course considers how political, social and economic factors have come to shape human patterns of interaction with the natural environment. Provides a sociological perspective on environmental problems such as environment and health, disaster, environmental policy, environmental risk, sustainability, human and animal interactions, environmental justice and social movements. ***Prerequisites: COMM F131X or COMM F141X; SOC F100X; SOC F201; SOC F263; 3 credits in SOC at the the F300-level; or permission of instructor.*** (3+0)

SOC F460 **Global Issues in Sociological Perspective** (s)
3 Credits
A sociological analysis of global issues, with different overarching themes depending on world events and the research interests of the instructor. Issues of global social justice and inequality are explored, and sociological and other theories are applied. ***Prerequisites: One lower social science course; junior standing or permission of instructor.*** (3+0)

SOC F480 W **Qualitative Social Science Research** (s)
3 Credits Offered Spring Odd-numbered Years
Introduction to classical and contemporary research within the qualitative (or interpretive) paradigm of social science. Discusses the theoretical frameworks, historical traditions, epistemological and ethical issues of qualitative approaches. Uses hands-on experience in the practicalities and excitement of a variety of methods for gathering qualitative data and conducting qualitative analysis. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; one lower-division social science research methods course; or permission of instructor.*** Cross-listed with PSY F480. (3+0)

SOC F490 **Capstone Seminar** (s)
3 Credits Offered Spring
Review of the discipline of sociology with a focus on the theoretical perspectives and methodological tools of the discipline, key substantive issues in the field and the role of sociology in contemporary society. ***Prerequisites: SOC F303; SOC F373; Sociology major with senior standing; or permission of instructor.*** (3+0)

SOFTWARE ENGINEERING

SWE F471 W **Software Engineering** (m)
3 Credits Offered Fall
Introduction to basic software engineering principles, techniques, methods and standards as applied to the engineering of complex software systems. Topics from software system development process models, multiple view system modeling and specification using UML, classification of software systems, project management and legal issues. ***Prerequisites: Senior standing; CS F311; ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** Cross-listed with CS F471. (3+0)

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SWE F670 Computer Science for Software Engineers
3 Credits
An overview and survey of the theoretical underpinnings of computer science. Topics are taken from the areas of algorithms and data structures; computer architecture; computer networks, communications and operating systems; computability and formal languages; languages and compilation. Also available through the Center for Distance Education. ***Prerequisites: Admission to the Master of Software Engineering degree program. Not required for students with a B.S. degree in Computer Science.*** Cross-listed with CS F670. (3+0)

SWE F671 Advanced Software Engineering
3 Credits Offered Spring
Advanced software development as an engineering discipline. Includes investigation of current tools, standards, foundation and trends in software engineering, from component-ware, software system composition, e-systems, software architecture and CASE tools. ***Prerequisites: SWE F471.*** Cross-listed with CS F671. (3+0)

SWE F672 Software Process Improvement
3 Credits Offered Spring Odd-numbered Years
Commonly applied methods for improving the software development process. Emphasis on the Software Engineering Institute's capability maturity model, and specifically on the key process areas of level 2 and level 3 of that model. These include software standards. ***Prerequisites: SWE F671 or permission of instructor.*** Cross-listed with CS F672. (3+0)

SWE F673 Software Requirements Engineering
3 Credits Offered as Demand Warrants
Focus on the requirements analysis phase of the software development life cycle. Ways to obtain, analyze and specify complete and correct sets of requirements. Critique of selected requirements analysis models. Study of current large scale software developments that have failed or are failing. Development of software requirements specifications for large and real software systems via team efforts. Also available through the Center for Distance Education. ***Prerequisites: SWE F671 or permission of instructor.*** Cross-listed with CS F673. (3+0)

SWE F674 Software Architecture
3 Credits Offered Spring
Software architectural styles are introduced and defined as structural descriptions of software systems. Methods for constructing and binding software systems are introduced and specified as operational views. The architectural approach, as a classical engineering method for describing structure and behavior of technical artifacts, will be applied for the composition of software systems. ***Prerequisites: SWE F671.*** Cross-listed with CS F674. (3+0)

SWE F690 Graduate Seminar and Project
1-6 Credits Offered Fall
First semester of a two-semester seminar in which students will, individually or in teams, work on and present the results of major programming or literature survey projects in computer science and software engineering. Written and oral reports will be required. Graded Pass/Fail. ***Prerequisites: 12 credits in graduate CS or SWE courses or permission of Computer Science or Software Engineering graduate advisor.*** Cross-listed with CS F690. (1-6+0)

SWE F691 Graduate Seminar and Project
3 Credits Offered Spring
Second semester of a two-semester seminar in which students will, individually or in teams, work on and present the results of major programming or literature survey projects in computer science. Written and oral reports will be required. Graded Pass/Fail. ***Prerequisites: SWE F690, 12 credits in graduate CS or SWE courses; or permission of Computer Science or Software Engineering graduate advisor.*** Cross-listed with CS F691. (3+0)

SPANISH

SPAN F100A Elementary Spanish 1A (h)
3 Credits Offered as Demand Warrants
Spanish language and culture with an emphasis on spoken and written language. Does not meet Perspectives on the Human Condition requirements, or Foreign Language major or minor requirements. (3+0)

SPAN F100B Elementary Spanish 1B (h)
3 Credits Offered as Demand Warrants
Spanish language and culture with an emphasis on spoken and written language. Does not meet Perspectives on the Human Condition requirements, or Foreign Language major or minor requirements. ***Prerequisites: SPAN F100A; or permission of instructor.*** (3+0)

SPAN F101 Elementary Spanish I (h)
5 Credits Offered Fall
Introduction to the language and culture: development of competence and performance in the language through understanding, recognition and use of linguistic structures; increasing emphasis on listening comprehension and speaking; basic vocabulary of approximately 1,000 words; exploration of the cultural dimension, implicitly through language and explicitly through texts and audiovisual materials. (5+0)

SPAN F102 Elementary Spanish II (h)
5 Credits Offered Spring
Introduction to the language and culture: development of competence and performance in the language through understanding, recognition and use of linguistic structures; increasing emphasis on listening comprehension and speaking; basic vocabulary of approximately 1,000 words; exploration of the cultural dimension, implicitly through language and explicitly through texts and audiovisual materials. ***Prerequisites: SPAN F101; or SPAN F100A and SPAN F100B; or the equivalent.*** (5+0)

SPAN F103 Conversational Spanish I (h)
3 Credits Offered Fall, Summer, As Demand Warrants
Verbal skills improvement. Includes role playing, problem solving and situational conversation. Conducted entirely in Spanish. Note: Does not satisfy core curriculum or foreign language major requirements. Graded Pass/Fail. ***Prerequisites: SPAN F100A and SPAN F100B; or SPAN F101; or permission of instructor.*** (3+0)

SPAN F201 Intermediate Spanish I (h)
3 Credits Offered Fall
Continuation of SPAN F102. Increasing emphasis on reading, writing and oral ability. Conducted in Spanish. ***Prerequisites: SPAN F102 or equivalent; or permission of instructor.*** (3+0)

SPAN F202 Intermediate Spanish II (h)
3 Credits Offered Spring
Continuation of SPAN F201. Increasing emphasis on reading, writing and oral ability. Conducted in Spanish. ***Prerequisites: SPAN F201 or equivalent; or permission of instructor.*** (3+0)

SPAN F203 SI SI! (Summer Intensive Spanish Immersion) (h)
3 Credits Offered Summer As Demand Warrants
Intensive two week language immersion. Verbal skills improvement. Includes role playing, problem solving and situational conversation. Conducted entirely in Spanish. Note: Does not satisfy core curriculum. ***Prerequisites: SPAN F201; F202 or equivalent; or permission of instructor.*** (3+0)

SPAN F221 Cultures and Civilizations of Latin America
3 Credits Offered Spring Odd-numbered Years
Designed to provide students of Spanish language and others interested in Hispanic culture with background in the geography, history, religions, cultures and politics of Latin America. We will also explore the changes and challenges facing contemporary Latin American society. Conducted in English. ***Recommended: SPAN F102.*** (3+0)

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SPAN F222 **Cultures and Civilizations of Spain** (h)
3 Credits Offered Spring Even-numbered Years
Designed to provide students of Spanish language and others interested in Hispanic culture with background in the geography, history, religions, cultures, and politics of Spain. Explores the changes and challenges facing contemporary Spanish society. Conducted in English. ***Recommended SPAN F102.*** (3+0)

SPAN F301 O **Advanced Comprehension and Conversation** (h)
3 Credits Offered Fall
Focus on increasing writing and listening comprehension. Discussions, presentations and exercises to enhance verbal competence. Conducted in Spanish. Note: Course may be repeated for credit if topic varies. ***Prerequisites: COMM F131X or COMM F141X; SPAN F202 or equivalent; or instructor permission.*** (3+0)

SPAN F302 W **Introduction to Literary Comprehension** (h)
3 Credits Offered Spring
An introduction to the understanding and analysis of Hispanic literature, with particular emphasis on the forms of written Spanish. Conducted in Spanish. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; SPAN F202 or equivalent; or permission of instructor.*** (3+0)

SPAN F311 **Advanced Spanish Composition** (h)
3 Credits
Practice of formal and informal writing styles in Spanish. Focus on vocabulary and stylistic issues. Course offered via distance learning. ***Prerequisites: SPAN F202. Recommended: ENGL F111.*** (3+0)

SPAN F317 **Advanced Spanish Grammar** (h)
3 Credits
Grammatical concepts in Spanish. Focus on more difficult grammatical structures. Also available through the Center for Distance Education. ***Prerequisites: SPAN F202 or equivalent or permission of instructor.*** (3+0)

SPAN F431 O **Senior Seminar** (h)
3 Credits Offered Fall
Topics may include literature, arts and cultures of the Spanish-speaking world. Conducted in Spanish. Students may repeat course for credit if topic varies. ***Prerequisites: COMM F131X or COMM F141X; SPAN F302 or equivalent; senior standing; or permission of instructor.*** (3+0)

SPAN F432 W **Studies of Hispanic Literature** (h)
3 Credits Offered Spring
Intensive study of authors, literary texts, movements, genres, themes and/or critical approaches. Note: Course may be repeated for credit if topic varies. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; SPAN F302 or equivalent; junior standing; or permission of instructor.*** (3+0)

SPAN F482 **Selected Topics in Spanish** (h)
3 Credits Offered as Demand Warrants
Intensive course focusing on topics not covered in SPAN F431 or SPAN F432. Note: Course may be repeated for credit if topic varies. ***Prerequisites: SPAN F302 or equivalent; junior standing, or permission of instructor.*** (3+0)

SPAN F488 **Individual Study: Senior Project** (h)
3 Credits Offered as Demand Warrants
Analysis and presentation, in Spanish, of a problem chosen by the student in consultation with the department. The student must apply for senior project and submit a project outline by the end of the sixth week of the semester preceding the semester of graduation. Offered normally in the semester preceding the student's graduation. Conducted in Spanish. ***Prerequisites: At least 10 credits in upper-division Spanish or permission of instructor.*** (3+0)

STATISTICS

STAT F200X **Elementary Probability and Statistics** (m)
3 Credits
Descriptive statistics, frequency distributions, sampling distributions, elementary probability, estimation of population parameters, hypothesis testing (one and two sample problems), correlation, simple linear regression, and one-way analysis of variance. Parametric methods. Also available through the Center for Distance Education. ***Prerequisites: MATH F107X or MATH F161X or placement; or permission of instructor.*** (3+0)

STAT F300 **Statistics** (m)
3 Credits Offered Spring; Fall Odd-numbered Years
A calculus-based course emphasizing applications. Topics include probability, joint and conditional probability, expectation and variance including maximum likelihood, one and two sample hypothesis tests including likelihood ratio tests, simple linear regression, and one-way analysis of variance. A student may not use STAT F200X and STAT F300 to meet the requirement of a year's sequence course in statistics. ***Prerequisites: MATH F200X or MATH F262X or MATH F272X or placement or equivalent.*** (3+0)

STAT F401 **Regression and Analysis of Variance** (m)
4 Credits
Thorough study of multiple regression including multiple and partial correlation, the extra sum of squares principle, indicator variables, polynomial models, model selection techniques and assessment of underlying assumptions. Analysis of variance and covariance for multifactor studies in completely random and randomized complete block designs, multiple comparisons and orthogonal contrasts. Matrix concepts for linear models are taught as needed. Also offered in Juneau as demand warrants. ***Prerequisites: STAT F200X [STAT S273-J] or STAT F300 or permission of instructor.*** (3+3)

STAT F402 **Scientific Sampling** (m)
3 Credits Offered Fall
Sampling methods, including simple random, stratified and systematic and one- and two-stage cluster sampling; estimation procedures, including ratio and regression methods; special area and point sampling procedures; optimum allocation. Adaptive and probability sampling; bootstrapping and basic mark-and-recapture. ***Prerequisites: STAT F200X or STAT F300 or permission of instructor.*** (3+0)

STAT F461 **Applied Multivariate Statistics** (m)
3 Credits Offered Spring Even-numbered Years
Estimation and hypothesis testing, multivariate normality and its assessment, multivariate one and two sample tests, confidence regions, multivariate analysis of variance, discrimination and classification, principal components, factor analysis, clustering techniques and graphical presentation. Statistical computing packages utilized in assignments. ***Prerequisites: STAT F401 or permission of instructor.*** (3+0)

STAT F480 **Topics in Statistics** (m)
1 Credit Offered as Demand Warrants
Short, intensive, selected topics of applied statistics. Example topics: nonlinear regression, logistic regression, repeated measures, the SAS language and the S-Plus package. Course may be repeated for credit if topic varies. ***Prerequisites: STAT F200X or STAT F300; STAT F401 or equivalent.*** (1+0)

STAT F602 **Experimental Design**
3 Credits Offered Fall Even-numbered Years
Constructing and analyzing designs for experimental investigations; completely randomized, randomized block and Latin-square designs, split-plot design, incomplete block design, confounded factorial designs, nested designs, treatment of missing data, comparison of designs. ***Prerequisites: STAT F401 or permission of instructor.*** (3+0)

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STAT F605 **Spatial Statistics**
3 Credits Offered Spring Even-numbered Years
Stochastic processes and variograms. Geostatistics including kriging and spatial design of experiments. Point processes including model selection and K-functions. Lattice process models and image analysis. Computer-intensive statistical methods. ***Prerequisites: STAT F401; MATH F200X-F202X or equivalent; or permission of instructor.*** (3+0)

STAT F611 **Time Series**
3 Credits Offered Spring Odd-numbered Years
An applied course in time series and repeated measure analysis. Autoregression and moving average models. Estimation of parameters and tests. Prediction. Spectral analysis. Analysis of repeated measures data. ***Prerequisites: STAT F401 or permission of instructor.*** (3+0)

STAT F621 **Distribution-Free Statistics**
3 Credits Offered Fall Odd-numbered Years
Methods for distribution-free (nonparametric) statistical estimation and testing. These methods apply to many practical situations including small samples and non-Gaussian error structures. Univariate, bivariate, and multivariate tests will be presented and illustrated using a variety of applications and data sets. ***Prerequisites: STAT F200X [STAT S273-J].*** (3+0)

STAT F631 **Categorical Data Analysis**
3 Credits Offered Fall Odd-numbered Years
Statistical methods designed for count and categorical data. Contingency tables. Logistic and related models. Loglinear models. Repeated categorical responses. Survival data. ***Prerequisites: STAT F401 or permission of instructor.*** (3+0)

STAT F641 **Bayesian Statistics**
3 Credits Offered Fall Even-numbered Years
Bayes' Rule, univariate Bayesian models, conjugate models and noninformative priors. Multiparameter models. Hierarchical models, general linear model and mixed models. Study of posterior simulation techniques including Markov Chain Monte Carlo and the Gibbs Sampler. Will involve analysis of data sets using WinBUGs and R. ***Prerequisites: MATH F201X; MATH F371-F408 or STAT F651; or permission of instructor*** (3+0)

STAT F642 **Bayesian Decision Theory for Resource Management**
4 Credits Offered Spring Even-numbered Years
Application of decision theory to problems in natural resources management. Students will learn to perform Bayesian calculations and uncomplicated decision analysis themselves. ***Prerequisites: FISH F621 of FISH F630; or permission of instructor.*** Cross-listed with FISH F642. (2+2)

STAT F651 **Statistical Theory I**
3 Credits Offered Fall
Probability and distribution of random variables. Conditional probability and stochastic independence. Distributions of functions of random variables. Expected values. Limiting distributions. Distributions derived from the normal distribution. Designed to combine mathematical statistics with applications from a variety of fields. Students from any field of study with strong quantitative skills are encouraged to enroll. ***Prerequisites: MATH F202X; MATH F314; previous statistics course; or permission of instructor.*** (3+0)

STAT F652 **Statistical Theory II**
4 Credits Offered Spring Odd-numbered Years
Estimation of parameters. Efficiency and sufficiency. Hypothesis testing. The Neyman-Pearson paradigm and likelihood ratio tests. Data summaries. Bootstrap. Comparison of two samples. Linear least squares. Analysis of categorical data. Bayesian inference. Designed to combine mathematical statistics with applications from a variety of fields. Students from any field of study with strong quantitative skills are encouraged to enroll. ***Prerequisites: STAT F651.*** (4+0)

STAT F653 **Statistical Theory III — Linear Models**
3 Credits Offered Spring Even-numbered Years
Best linear unbiased estimation, Gauss-Markov theory and applications, maximum likelihood estimation for linear models, multivariate normal distributions, linear regression and analysis of variance, weighted regression, robust and nonlinear regression, logistic regression, Poisson regression, autoregressive models and the General Linear Model. Designed to combine mathematical statistics with applications from a variety of fields. Students from any field of study with strong quantitative skills are encouraged to enroll. ***Prerequisites: STAT F651 or STAT F401; MATH F200X; MATH F201X; MATH F202X; MATH F314.*** (3+0)

STAT F654 **Statistical Consulting Seminar**
1 Credit Offered Spring
Introduction to statistical consulting and data analysis. Emphasis on interaction with researchers and identification of scientific and statistical issues relevant to the research problem. Includes regular class meetings as well as supervised meetings with researchers. Designed to combine mathematical statistics with applications from a variety of fields. Students from any field of study with strong quantitative skills are encouraged to enroll. May be repeated for a total of three credits. ***Prerequisites: STAT F200X or STAT F300; STAT F401; and completion of or concurrent enrollment in MATH F408; permission of instructor.*** (1+0)

STAT F661 **Sampling Theory**
3 Credits Offered Juneau As Demand Warrants
Statistical theory for sampling and sample surveys. Choice of method, power and sample size considerations, treatment of sampling and non-sampling biases. Sampling methods based on detectability. Adaptive sampling. Spatial sampling. Mark and recapture methods. The jackknife, the bootstrap and resampling plans. ***Prerequisites: STAT F200X [STAT S273-J]; STAT F401; or permission of instructor.*** (3+0)

THEATRE

THR F101 **Theatre Practicum** (h)
1-3 Credits
Participation in drama workshop or lab production as performer or technical staff member. Credit in this course may not be applied to a major program in Theatre. (0+0)

THR F121 **Fundamentals of Acting** (h)
3 Credits
Basic stage acting techniques for persons with little or no prior acting experience. Emphasis on physical, emotional and imaginative awareness. Monologues, character analysis, improvisation, auditions and scene work introduced. (3+0)

THR F130A **Beginning Jazz Dance**
1 Credit
Develop a repertoire of jazz dance movement and terminology including plies, isolations, stretches, traveling steps, battements, pas de burres, jazz slides and turns. History of jazz dance. Graded Pass/Fail. Cross-listed with RECR F130A. (0+3)

THR F130B **Intermediate Jazz Dance**
1 Credit
Develop a repertoire of a jazz dance movement and terminology including plies, isolations, stretches, traveling steps, battements, pas de burres, jazz slides and turns. History of jazz dance. Graded Pass/Fail. Cross-listed with RECR F130B. (0+3)

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THR F130C **Advanced Jazz Dance**
1 Credit
Develop a repertoire of jazz dance movement and terminology including plies, isolations, stretches, traveling steps, battements, pas de burres, jazz slides and turns. History of jazz dance. Graded Pass/Fail. Cross-listed with RECR F130C. (0+3)

THR F130D **Modern Dance**
1 Credit
Develop a repertoire of modern dance movement and terminology including contraction and release, swings, triplets, fall and recovery, rolls and improvisations. Graded Pass/Fail. Cross-listed with RECR F130D. (0+3)

THR F130E **Beginning Ballroom Dance**
1 Credit
Students with little or no background in social dance. Our aim is to have a good time and build a strong foundation for future learning. Dances covered include waltz, foxtrot, single-count swing, east coast swing, salsa, cha cha, merengue and, time permitting, polka. Graded Pass/Fail. Cross-listed with RECR F130E. (0+3)

THR F130F **Intermediate Ballroom Dance**
1 Credit
Dances covered include waltz, foxtrot, single-count swing, east coast swing, salsa, cha cha, merengue and, time permitting, polka. Our aim is to have a good time and build a strong foundation for future learning. This course is for students with a beginning background in social dance. Graded Pass/Fail. Cross-listed with RECR F130F. (0+3)

THR F130G **Advanced Ballroom Dance**
1 Credit
Dances covered include waltz, foxtrot, single-count swing, salsa, cha cha, merengue and, time permitting, polka. Our aim is to have a good time and build an even stronger foundation for future learning. This course is for students with an intermediate background in social dance. Graded Pass/Fail. Cross-listed with RECR F130G. (0+3)

THR F130H **Beginning Ballet**
1 Credit
Instruction and practice in ballet at beginning levels. Graded Pass/Fail. Cross-listed with RECR F130H. (0+3)

THR F130J **Intermediate Ballet**
1 Credit
Instruction and practice in ballet at intermediate levels. Graded Pass/Fail. Cross-listed with RECR F130J. (0+3)

THR F130K **Advanced Ballet**
1 Credit
Instruction and practice in ballet at advanced levels. Graded Pass/Fail. Cross-listed with RECR F130K. (0+3)

THR F130L **Square Dance**
1 Credit
Instruction and practice in square dance. Graded Pass/Fail. Cross-listed with RECR F130L. (0+3)

THR F130M **Round Dance**
1 Credit
Instruction and practice in round dances. Graded Pass/Fail. Cross-listed with RECR F130M. (0+3)

THR F130N **Middle Eastern Dance**
1 Credit Offered as Demand Warrants
Designed for students with some or no background in Middle Eastern dance or anyone who wants to refine their technique and gain a deeper understanding of the different styles, history and evolution of Middle Eastern dance from social dance to performance art. Majority of semester will focus on basic dance vocabulary and choreography as well as dancing with props such as veils and finger cymbals. Graded Pass/Fail. Cross-listed with RECR F130N. (0+3)

THR F130Q **Beginning Hip Hop**
1 Credit Offered as Demand Warrants
Introduction to basic movements and terminology of hip hop dances and associated body movements. Students will gain these principles and an ability to execute maneuvers presented in class. Graded Pass/Fail. Cross-listed with RECR F130Q. (0+3)

THR F161 **Introduction to Alaska Native Performance** (h)
3 Credits
For Native and non-Native students with no prior acting or theatre experience. Includes both academic and practical components to examine traditional Alaska Native theatre, mythology, ritual, ceremony and performance methods. Application of exercises and developmental scenes drawn from Alaska Native heritage. Cross-listed with ANS F161. (2+3)

THR F190 **Audition or Portfolio Review Participation**
0 Credits
Theatre majors are required to participate in auditions and/or portfolio reviews every semester. Theatre majors are also expected to attend all Theatre UAF productions (tickets are provided free) and to attend all theatre department "town" meetings. Graded Pass/Fail. (0+0)

THR F191 **Audition or Portfolio Review Participation**
0 Credits
Theatre majors are required to participate in auditions and/or portfolio reviews every semester. Theatre majors are also expected to attend all Theatre UAF productions (tickets are provided free) and to attend all theatre department "town" meetings. Graded Pass/Fail. (0+0)

THR F200X **Aesthetic Appreciation: Interrelation of Art, Drama and Music** (h)
3 Credits
Understanding and appreciation of art, drama and music through an exploration of their relationships. Topics include the creative process, structure, cultural application and diversity, the role of the artist in society, and popular movements and trends. ***Prerequisites: Placement in ENGL F111X or higher; sophomore standing; or permission of instructor.*** Cross-listed with ART F200X; MUS F200X. (3+0)

THR F215 **Dramatic Literature** (h)
3 Credits
Studies of drama and forms of plays such as tragedy, comedy, melodrama, farce and tragicomedy. Emphasis on reading plays of the classic theatre designed to give basic knowledge of masterpieces of the world drama. Cross-listed with FLM F215. (3+0)

THR F220 **Voice and Speech for the Actor**
3 Credits
Vocal training for actors through introduction to Fitzmaurice and Linklater techniques. Course will include basic vocal anatomy, introduction to the International Phonetic Alphabet and monologue performance. Special fees apply. ***Prerequisites: THR F121 or permission of instructor.*** (2+2)

THR F221 **Intermediate Acting** (h)
3 Credits
Continued development of physical, emotional and imaginative awareness. Emphasis on comedy, improvisation and biomechanics. ***Prerequisites: THR F121 or permission of instructor.*** (1+4)

THR F225 **Movement for the Actor** (h)
3 Credits
Introduces principles of stage movement for actors. Attention will be paid to physical exercise, relaxation, centering and expressing creative impulse. Course will include introduction to the contact improvisation technique, clowning, stage combat, physical character development and scene work. Special fees apply. ***Prerequisites: THR F121.*** (1+4)

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THR F241 **Basic Stagecraft** (h)
4 Credits
Materials of scene construction, painting, lighting design and their use, safe use of standard construction tools, fundamentals of theatre drafting. Theatre majors are encouraged to fulfill this requirement by their junior year. Special fees apply. (2+5)

THR F245 **Stage and Film Production Management** (h)
3 Credits
Define and develop organizational skills to be a successful stage or film production manager. Creation of a prompt script including all forms and schedules necessary, working with actors, directors and designers. Creation of film production schedules, call sheets, shooting scripts, location management, and union requirements. Cross-listed with FLM F245. (3+0)

THR F247 **Introduction to Theatrical Design** (h)
3 Credits
Introduction to all the design elements used in the theatre. Analysis of line, texture, color, and how they relate to designing for the theatre including costumes, scenery and lighting. Cross-listed with ART F247. (3+0)

THR F254 **Costume Design and Construction I** (h)
3 Credits
Introduction to theory and practice of costume design for the theatre, methods used to make costumes out of a variety of media. Projects include simple hat making, mask making, sewing and related costume crafts. Special fees apply. (3+0)

THR F271 **Let's Make a Movie!**
3 Credits Offered Fall
Produce a short dramatic video including concept and script development, basic camera and shooting techniques, working with actors, directing fundamentals, location scouting, production schedule development, basic non-linear editing techniques, and DVD authoring. Students do not need previous experience making movies to take this class. Special fees apply. ***Recommended: THR F121; THR F241.*** Cross-listed with FLM F271. (3+0)

THR F280 **Modern Dance** (h)
2 Credits
Introduction to dance combines elements of modern, jazz and improvisational styles. Includes warm-up, stretches, locomotor movements (walking, running and leaping), set dance combinations, and improvisational activities. Specific readings, individual journals and informal dance presentations required. Open to all experience levels. (1.5+1.5)

THR F290 **Audition or Portfolio Review Participation II**
0 Credits
Theatre majors are required to participate in auditions and/or portfolio reviews every semester. Theatre majors are also expected to attend all Theatre UAF productions (tickets are provided free) and to attend all theatre department "town" meetings. Graded Pass/Fail. (0+0)

THR F291 **Audition or Portfolio Review Participation II**
0 Credits
Theatre majors are required to participate in auditions and/or portfolio reviews every semester. Theatre majors are also expected to attend all Theatre UAF productions (tickets are provided free) and to attend all theatre department "town" meetings. Graded Pass/Fail. (0+0)

THR F301 **Theatre Practicum** (h)
1-3 Credits
Participation in drama workshop or lab production as performer or technical staff member. Credit in this course may not be applied to a major program in Theatre. (0+0)

THR F310 **Acting for the Camera** (h)
3 Credits
Apply skills introduced in fundamentals of acting, intermediate and advanced acting to acting for the camera. Through exercises and scene study, the class will expand each performer's range of emotional, intellectual, physical and vocal expressiveness for the camera. Act in numerous on-camera exercises, television and film scenes. May be repeated twice for credit. Special fees apply. ***Prerequisites: THR F121. Recommended: THR F221; THR F321.*** Cross-listed with FLM F310. (3+0)

THR F321 **Advanced Acting** (h)
3 Credits
Refinement of physical, emotional and imaginative awareness. Emphasis on study and performance of monologues and scenes exploring emotionally based character-building methods. Course will also include audition technique and preparation for the professional world of acting. ***Prerequisites: THR F221 or permission of instructor.*** (1+4)

THR F331 **Directing Film / Video** (h)
3 Credits
Introduction to the history, theory and basic concepts of film stage direction. Includes interpretative script analysis, creative visualization, conceptualization, use of space, working with actors and designers, and direction of short scenes and videos. Special fees apply. ***Prerequisites: THR F121; THR F215; or permission of instructor.*** Cross-listed with FLM F331. (1+4)

THR F332 **Directing Theatre** (h)
3 Credits
History, theory and basic concepts of stage direction. Interpretive script analysis, creative visualization, conceptualization, use of space, working with actors and designers and direction of short scenes. ***Recommended: THR F121.*** Cross-listed with FLM F332. (3+0)

THR F334 W **Movies and Films: Watching and Analyzing** (h)
3 Credits
Rotating thematic topics in the art of classic cinema (films) and the popular mass media (movies). Comparative analysis of classics and recent motion pictures is used to present elements of film language, analysis and criticism in this writing intensive course. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** Cross-listed with FLM F334. (3+0)

THR F341 **Intermediate Stagecraft** (h)
3 Credits
An examination of the less common scenic materials with methods and techniques for their use. Students will spend approximately $40 for materials. Special fees apply. ***Prerequisites: THR F241 or permission of instructor. Recommended: THR F246.*** (2+2)

THR F343 **Scene Design** (h)
3 Credits
Principles and techniques of theatrical scene design. Includes designing projects directed at solving particular scenic problems or in a specific scenic style with specific physical limitations. Students will spend approximately $40 for materials. ***Prerequisites: THR F241 or permission of instructor.*** (3+0)

THR F347 O **Lighting Design** (h)
3 Credits
Principles and techniques of theatrical lighting design. The student will conduct practical experiments and design projects applying the experience gained from the experiments. Students will spend approximately $40 for materials. Also available through the Center for Distance Education. ***Prerequisites: COMM F131X or COMM F141X. Recommended: THR F241; THR F247.*** Cross-listed with ART F347; FLM F347; JRN F347. (3+0)

THR F348 **Sound Design for the Entertainment Industry** (h)
3 Credits Offered Spring Odd-numbered Years
Exploration and application of the elements of design as they relate to sound for theatre, dance, film, video, and other art forms, and life in American and

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other cultures. Production work is required. Special fees apply. ***Recommended: THR F241; THR F247.*** Cross-listed with FLM F348. (2+2)

THR F351 **Makeup for Theatre** (h)
3 Credits Offered Spring
Theatrical makeup for actors, teachers, directors and other theatre workers; makeup materials and use, age and character makeup, injuries and horror, Kabuki, cross-gender, animal, illusory and plastic relief, crepe hair beards, and influence of lighting. Students will spend approximately $85 for materials and book. (1+4)

THR F355 **History of Fashion and Dress** (s)
3 Credits Offered as Demand Warrants
Social history of costume in Western civilization, from Ancient Greece to the present time. Includes instruction in the methods of research used to find visual source material and assignments that exercise these research skills. ***Recommended: HIST F101 or HIST F102.*** (3+0)

THR F361 **Advanced Alaska Native Performance**
3 Credits
In-depth study of Alaska Native theatre techniques and tradition, including traditional dance, song and drumming techniques, mask characterizations and performance application and presentation of a workshop production developed by the students during the semester. ***Prerequisites: ANS/THR F161.*** Cross-listed with ANS F361. (2+3)

THR F410 **Styles Acting** (h)
3 Credits
Exposure to the rigorous physical, vocal, intellectual and emotional demands of period acting. Focus on monologue and scene study from texts including Greek tragedy, commedia, Shakespeare and Elizabethan theatre, the theatre of Moliere and restoration comedy. May be repeated twice for credit. ***Prerequisites: THR F121; THR F220; THR F221. Recommended: THR F225.*** Cross-listed with FLM F310. (3+0)

THR F411 W **Theatre History I** (h)
3 Credits
Theatrical form and practice from its origins in storytelling and ritual through the French Neoclassic theatre. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; junior standing; or permission of instructor.*** (3+0)

THR F412 W **Theatre History II** (h)
3 Credits
Theatrical form and practice from the English Restoration through the present. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; junior standing; or permission of instructor.*** (3+0)

THR F413 W **Playscript Analysis** (h)
3 Credits
Investigation of the structure of playscripts designed to develop skills in analysis and interpretation for performance. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; junior standing; or permission of instructor.*** (3+0)

THR F416 W **Performance Studies Abroad** (h)
6 Credits
Intensive course for actors, directors, designers, technicians and playwrights interested in script development/training with the participation of international theatre professionals. Develop new scripts and performances in a multicultural environment under the supervision of a theatre faculty member. Previous faculty and student work abroad includes: Russia, Zambia, South Africa and Scandinavia. Course requirements vary according to the project. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** Stacked with NORS F616. (3+9)

THR F417 **Internship in Theatre Practice**
1-6 Credits Offered as Demand Warrants
Supervised practical work experience to provide application of course work in a professional, semi-professional or community theatre environment. Internships can be in direction, acting, design, management and technical theatre. Internships have included Perseverance Theatre, Fairbanks Shakespeare Theatre, Fairbanks Drama Association, and Out North Theatre. Course may be repeated twice for a maximum of 12 credits. Note: Internship must be arranged in coordination with advisor, student and host institution. ***Prerequisites: Completed at least 18 THR credits; upper-division standing; permission of instructor. Recommended: Previous THR credits should be in the student's concentration area: direction, design, etc.*** (0+0)

THR F447 **Lighting Design II** (h)
3 Credits
Further exploration and application of elements of design (color, texture, intensity, line, composition) as they relate to lighting for theatre, dance, other art forms and life. Production work required. ***Prerequisites: THR F347 or permission of instructor.*** (2+2)

THR F456 **Advanced Topics in Costume Design and Construction** (h)
3 Credits
Rotating thematic topics in advanced methods and materials used in the design and construction of costumes for the theatre. Topics may include projects in design, advanced sewing and pattern drafting, millinery, masks, corsetry, or painting and dyeing, as demand warrants. May be repeated twice for credit. Special fees apply. ***Prerequisites: THR F254 or permission of instructor.*** (3+0)

THR F470 **Advanced Film and Video Directing** (h)
3 Credits
In depth investigation into the history, theory, basic concepts of film and video direction, script preparation, story board, blocking actors and staging the camera and sound, editing. Projects include directing and shooting short videos. Special fees apply. ***Recommended: THR/FLM F331.*** Cross-listed with FLM F470. (1+6)

THR F482 **Dance Performance** (h)
2 Credits
Exploration and performance of expressive dance and movement. Includes development of an original choreography for public performance. Course is for advanced dance, acting and directing students with varying experience. ***Prerequisites: THR F280 or movement performance experience.*** (1.5+1.5)

THR F485 **Edward Albee Prince William Sound Theatre Conference** (h)
3 Credits
Intensive, practical theatre experience in new play development, workshops and readings. Offered in conjunction with the 10-day Edward Albee Prince William Sound Theatre Conference in Valdez, Alaska. Includes working with leading American playwrights and directors to develop new plays. (Student pays separate conference fee of about $150 directly to conference.) ***Prerequisites: Theatre experience or courses in any of the following areas: acting, directing, playwriting, dramaturgy and design; or permission of instructor.*** (1+6)

THR F488 W **Dramatic Writing** (h)
3 Credits Offered Even Alternate Fall
Introduction to the craft of dramatic writing for theater and film, with an emphasis on dramatic storytelling. Course will focus on giving students a practical understanding of the uses of story structure, setting, character, plot and dialog, and how these elements work together to create compelling drama. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; or permission of instructor.*** Cross-listed with ENGL F488; FLM F488. (3+0)

THR F499 **Thesis Project** (h)
3 Credits
Final step in acting/directing/design or playwright training which involves performing a leading role on main stage, or a one-person show, or a directing/designing/writing project for the UAF season. ***Prerequisites: Permission of instructor.*** (1+4)

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TRADES AND TECHNOLOGY

TTCH F099 Practicum
1-3 Credits
Individual work and development of skills learned in prior courses. (0+0)

TTCH F101 Machine Woodworking I
2 Credits
Introduction to woodworking power machines (circular saw, jointer, radial arm saw), joints, fasteners, and different stains and finishes used on wood. (2+0)

TTCH F105 Basic Electrical Wiring
1 Credit
Fundamental skills and career opportunities in electrical wiring. (1+0)

TTCH F110 Basic Safety Training for Building Maintenance and Repair
2 Credits
How to care for tools and use them safely, properly and efficiently using HILTI standards, follow OSHA standards to maintain a safe workplace and identify unsafe workplace situations. These standards ensure safety in construction operations. Upon passing the HILTI and OSHA testing standards, certification will be given. (2+0)

TTCH F113 Basic Plumbing
3 Credits
Introduction to methods and materials used in household plumbing. Topics includes pipe fittings and valves, pipe hangers and brackets, copper and plastic pipe fitting and plumbing fixtures. (3+0)

TTCH F117A Four-Cycle Engine Repair
1 Credit
Four-cycle engine theory and principles of operation. Classroom activities include step-by-step disassembly, inspection and assembly of a four-cycle engine. Graded Pass/Fail. (1+0)

TTCH F117B Two-Cycle Engine Repair
1 Credit
Two-cycle engine theory and principles of operation. Classroom activities include step-by-step disassembly, inspection and assembly as well as familiarization with tools used in small engine repair. Graded Pass/Fail. (1+0)

TTCH F120 Refrigeration and Air Conditioning
4 Credits
Fundamentals of refrigeration and air conditioning theory in preparation for further study. Topics include compressors, condensers, evaporators, metering devices and related components. Assumes no previous knowledge. (4+0)

TTCH F125 Introduction to Carpentry for Building Maintenance and Repair
3 Credits Offered as Demand Warrants
Uses of lumber, commonly used hardware fasteners, types of tools and their uses, how to care for tools and use them safely, properly and efficiently. Building projects are completed which apply what was learned in the classroom. These skills are needed in maintenance positions in private businesses, schools and hospitals and in residential construction and renovation. (2+2)

TTCH F130 Blueprint and Schematic Reading
3 Credits
Basic blueprint and schematic reading skills used by building maintenance personnel. Introduction to machine drawings, building drawings, hydraulic and pneumatic drawings, electrical schematics and symbols, air conditioning and refrigeration drawings, welding and joining symbols. (3+0)

TTCH F131 Mathematics for the Trades
3 Credits
Practical application of mathematics for industry and preparation for union apprenticeship programs, including arithmetic review, ratios and proportion, powers and roots, algebra, geometry and trigonometry. Mathematical applications of basic physics with reference to units of measurement, use of precision measuring tools, measurement of forces, temperature, fluids and electricity. (3+0)

TTCH F132 Building Maintenance Materials
3 Credits
Basic properties, processes and uses of metals and non-metals in tools, machines and building materials. Practical application to building maintenance situations will be emphasized. (3+0)

TTCH F133 Basic Hand and Power Tools
3 Credits
Uses, care and maintenance of hand and power tools. Familiarity and skill development with these tools through construction of shop projects. (3+0)

TTCH F134 Maintenance Safety
1 Credit
Industrial safety including recognizing safety hazards, working safely, handling materials safely, using machinery safely, personal protective equipment, electrical safety, fire protection and government safety regulations. (1+0)

TTCH F138 Introduction to Electricity for Building Maintenance and Repair
2 Credits Offered as Demand Warrants
Commonly used materials in the electrical trade. Provides basic understanding of the National Electrical Code, local codes and schematic drawings. Stresses safe installation and correct tool usage. Familiarity and skills are cultivated through projects. (1.5+2)

TTCH F140 Introduction to Plumbing for Building Maintenance and Repair
2 Credits
Basic plumbing materials that may be used in any plumbing system, how to use plumbing tools and completing selected projects. Includes using drawings to identify types of plumbing branches and bends, pipefittings, correct plumbing layout aids, and installation applications. (1.5+2)

TTCH F147 Burner Maintenance and Repair
1 Credit
Instruction in troubleshooting 10 common problems, reading manuals, changing parts, setting electrodes, changing nozzles, understanding controls and ordering replacement parts. (1+2)

TTCH F148 Heating Systems for Building Maintenance and Repair
2 Credits
Comprehensive instruction for people employed in installation and maintenance of heating systems. Installation and maintenance applications of fuel transfer, theories of combustion, nozzles, combustion chambers, heat exchangers, draft regulators, stacks, controls and sizing of systems. ***Recommended: TTCH F138.*** (1+1.5)

TTCH F150 Introduction to Painting for Building Maintenance and Repair
2 Credits
Surfaces and surface protection, sealants and fillers, paint categories and application tools. Hands-on projects are completed which apply skills learned in the classroom. These skills are needed in facility maintenance positions in businesses such as schools and hospitals, and in residential construction and renovation. (1+1.5)

TTCH F151 Hazardous Paint Certification
1 Credit
Potential health hazards and information on safety practices will be addressed. (1+0)

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TTCH F214 Heating Systems Design
3 Credits
Comprehensive instruction in installation and systems approach to design of heating systems including installation procedures of current systems, heat loss calculation, heat distribution through hydronic and air systems, and boiler and furnace sizing. (3+0)

TTCH F225 Advanced Carpentry for Building Maintenance and Repair
3 Credits Offered as Demand Warrants
Expand carpentry skills in measuring, plan reading, site layout skills and working with elevations. ***Prerequisites: TTCH F125 or permission of instructor.*** (2+2)

TTCH F250 Advanced Painting for Building Maintenance and Repair
2 Credits
Proper methods for finishing, patching and spray painting drywall. Skills studied in the classroom will be developed in various projects. ***Prerequisites: TTCH F150 or permission of instructor.*** (1+2)

TTCH F282 Selected Topics in Process Unit Design
4 Credits
Hands-on execution and application of automated process designs as they evolve from ideas to implementation. Emphasis will be on the expanded study of the purpose, utilization and adaptation of tools, machines, materials and systems to the solutions of automated process unit design problems. Course may be repeated three times for credit. Special fees apply. ***Prerequisites: PRT F101; PRT F110; or permission of instructor. Recommended: PRT F130; PRT F140.*** (2+4)

TTCH F300 Internship in Technology
1-3 Credits
Supervised practical experience working with private industry, government units or agencies in technologies. Opportunities to apply theories and practical application and to observe procedures and operations of the businesses or agencies. May be repeated for a maximum of 9 credits. Graded Pass/Fail. ***Prerequisites: Upper-division standing and permission of instructor.*** (0+12)

TTCH F301 Technology and Society
3 Credits
Concepts of social change related to the effects of technology on society, and application of the concepts and processes of technology as they evolve from ideas to implementation. Emphasis on expanded study of the creation, use and adaptation of tools, machines, materials and systems to the solutions of problems and the extension of human potential. Available via Independent Learning. ***Prerequisites: Upper-division standing or permission of instructor.*** (3+0)

TTCH F485 Advanced Technical Experiences: Discipline Area
1-6 Credits
Formal technical upgrade training provided by various agencies, manufacturers, businesses or industries which are evaluated on an individual basis and must support the student's professional objectives. For Bachelor of Technology students only. The National Guide to Educational Credit for Training Programs will be used. Graded Pass/Fail. ***Prerequisites: Upper-division standing and permission of instructor.*** (1-6+0)

TRIBAL MANAGEMENT

TM F101 Introduction to Tribal Government
3 Credits
Comprehensive study of tribal government and politics in rural Alaska. Explores the differences and relationships among tribal, state and federal government. Presents key concepts for building and enhancing tribal government for building program and institutional development. ***Prerequisites: Must be familiar with computer and related word processing and spreadsheet programs.*** (3+0)

TM F105 Introduction to Tribal Finance Applications
3 Credits
Tools and methods for the management and oversight of tribal government programs and organizations in rural Alaska. Student evaluation includes how well the student affects changes in tribal operations and tribal management. ***Prerequisites: Must be familiar with computer and related word processing and spreadsheet programs.*** (3+0)

TM F110 Tribal Court Development for Alaska Tribes
1 Credit
An introduction to tribal court development in Alaska. Will focus on a practical understanding of key concepts for developing a tribal court process in rural Alaska. Will explore the differences and relationships between tribal, state, and federal justice systems, including concepts of jurisdiction and due process. Graded Pass/Fail. (1+0)

TM F111 Children's Topics in Tribal Justice
1 Credit Offered as Demand Warrants
Overview of children's cases in tribal justice. Preparation for informed participation in the tribal justice system as it affects children and families. Topics such as the Indian Child Welfare Act, child protection, child custody and tribal adoptions will be addressed. Graded Pass/Fail. ***Recommended: TM F110.*** (0+0)

TM F112 Federal Indian Law for Alaska Tribes
1 Credit Offered as Demand Warrants
Introduction to federal Indian law, focusing on the impacts to modern Alaskan tribal governments. Particular attention will be given to the relationship between federal Indian law and tribal justice systems in Alaska. Graded Pass/Fail. ***Recommended: TM F110.*** (0+0)

TM F113 Tribal Code Development
1 Credit Offered as Demand Warrants
Focuses on development of written tribal codes, including the importance of incorporating traditional unwritten laws and values into modern written codes. Particular attention will be given to the relationship between written tribal laws and tribal justice systems. Graded Pass/Fail. ***Recommended: TM F110.*** (0+0)

TM F114 Tribal Justice Responses to Community and Domestic Violence
1 Credit Offered as Demand Warrants
Focuses on role of the tribal justice system in responding to community and domestic violence, including the use of tribal protective orders under the federal Violence Against Women Act (VAWA). Graded Pass/Fail. ***Recommended: TM F110.*** (0+0)

TM F115 Tribal Court Administration
1 Credit Offered as Demand Warrants
Focuses on the administration of tribal courts in Alaska and the role of the tribal court clerk. Key concepts and strategies related to the effective administration and operation of tribal justice systems in Alaska will be discussed. Graded Pass/Fail. ***Recommended: TM F110.*** (0+0)

TM F116 Juvenile Justice in Tribal Court
1 Credit Offered as Demand Warrants
Focuses on concepts and strategies impacting juveniles in tribal justice systems. Special focus will be given to issues of juvenile delinquency, strategies in sentencing and community monitoring, as well as, youth courts and community justice theories. Graded Pass/Fail. ***Recommended: TM F110.*** (0+0)

TM F117 Tribal Court Enforcement of Decisions
1 Credit Offered as Demand Warrants
Focuses on role of the tribal government and justice system in enforcement of tribal court decisions in rural Alaska, including monitoring of offenders.

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Key concepts and strategies related to enforcement of tribal court decisions, including writing effective orders and monitoring of offenders, will be discussed. Graded Pass/Fail. ***Recommended: TM F110.*** (0+0)

TM F118 **Tribal Community and Restorative Justice**
1 Credit Offered as Demand Warrants
Focuses on concepts and strategies in community justice, restorative justice, tribal peacemaking and other prominent judicial theories impacting modern Alaskan tribal jurisprudence. Graded Pass/Fail. ***Recommended: TM F110.*** (0+0)

TM F120 **Introduction to Tribal Natural Resource Management**
3 Credits
Introduction to natural resource management, including tribal natural resource management. Examines the basic goals and principles of (tribal) natural resource management, including the roles of traditional knowledge and scientific research in supporting management activities. (3+0)

TM F130 **Introduction to Utility Management**
2 Credits
Principles and practices involved in managing small water and wastewater facilities in rural Alaskan communities, including basic terms, key concepts and an overview of five management functions: organizational, financial, personnel, planning and operational management. Graded Pass/Fail. (2+0)

TM F131 **Organizational Management for Utilities**
2 Credits
Organizational principles and practices involved in managing small water and wastewater facilities in rural Alaskan communities, including an overview of responsibilities, governance authority and accountability. Graded Pass/Fail. (2+0)

TM F132 **Operations Management for Utilities**
2 Credits
Focus is on specific skills and knowledge that a rural utility manager needs to efficiently oversee a rural utility. Includes understanding what the operator's duties are and how much time is needed to perform them, as well as related knowledge and skills about safety, scheduling, data collection, public relations, inventory control and contingency planning. Graded Pass/Fail. ***Recommended: TM F130.*** (2+0)

TM F134 **Financial Management for Utilities**
2 Credits
The components of financial management needed to successfully oversee a rural utility. Basic procedures and process will be covered, including materials on financial reporting, fund accounting, budgeting, collections, risk management and financial audits. Graded Pass/Fail. ***Recommended: TM F130.*** (2+0)

TM F136 **Personnel Management for Utilities**
2 Credits
Tools a rural utility manager needs to keep the work force performing to its fullest. Topics include: personnel policies and procedures; safety policy and programs; selecting and hiring staff; orientation and training; regulations and the law; people, communications and conflict; motivation and management. Graded Pass/Fail. ***Recommended: TM F130.*** (2+0)

TM F138 **Planning for Utilities**
2 Credits
Leads the student through the whole planning process as it applies to managing small water and wastewater facilities in rural Alaska communities. Includes why it is important to get the public involved, how to develop water/sewer alternatives and evaluate them, and how to get a construction project started. Graded Pass/Fail. ***Recommended: TM F130.*** (2+0)

TM F170 **Fundamentals of Rural Transportation**
4 Credits Offered as Demand Warrants
Provides an introduction to managing the unique multi-modal transportation system in rural Alaska. Course is designed for entry-level transportation managers or those new to rural transportation issues. Graded Pass/Fail. (4+0)

TM F171 **Introduction to the Indian Reservation Roads Program**
1 Credit Offered as Demand Warrants
Introduction to the federal Indian Reservation Roads (IRR) program. The course will cover the history of the program, including recent program changes and their applicability to and effect on Alaska Native Tribes and communities in rural Alaska. The fundamentals of implementing a tribal IRR program will be presented. Graded Pass/Fail. (1.25+0)

TM F172 **Conducting a Rural Transportation Inventory**
1 Credit Offered as Demand Warrants
Provides students with hands-on experience in conducting a field inventory of transportation facilities. Emphasis on meeting the inventory requirements for the Indian Reservation Roads program ***Recommended: TM F171.*** (17+0)

TM F173 **Traffic Monitoring for Rural Transportation**
1 Credit Offered as Demand Warrants
Provides students with the basic tools to conduct a traffic monitoring program in rural Alaska. Topics covered include: the purpose of traffic monitoring; terms, definitions and acronyms commonly used in traffic monitoring; deciding where and when to monitor; required and optional data; data collection tools and techniques; adjustment factors and adjusted average daily traffic (ADT) calculations and data reporting. Emphasis is placed on meeting the ADT requirements of the Indian Reservation Roads program. Graded Pass/Fail. ***Recommended: TM F171; TM F172.*** (21+0)

TM F174 **Basics of a Good Gravel Road**
1 Credit Offered as Demand Warrants
Provides students with a basic understanding of what makes a good gravel road. This course is designed for entry-level transportation managers as well as transportation maintenance and operations staff. Graded Pass/Fail. ***Recommended: TM F171; TM F172; TM F173.*** (21+0)

TM F199 **Tribal Management Practicum I**
3 Credits
Professional and personal development while working in a rural service organization. Emphasis on developing the understanding and skills necessary for delivery of rural services. Course is guided by an academic advisor. Student must be willing and able to work independently outside the classroom and in the community. ***Prerequisites: Must be familiar with computer and related word processing and spreadsheet programs.*** (3+0)

TM F201 **Advanced Tribal Government**
3 Credits Offered Spring
Comprehensive study of tribal government and politics in rural Alaska. Explores the differences and relationships among tribal, state and federal government. Presents key concepts for building and enhancing tribal government for building program and institutional development. ***Prerequisites: Must be familiar with computer and related word processing and spreadsheet programs.*** (3+0)

TM F205 **Advanced Tribal Finance Applications**
3 Credits
Advanced tools and methods for the management and oversight of tribal government programs and organizations in rural Alaska. Student evaluation includes how well the student affects changes in tribal operations and tribal management. ***Prerequisites: TM F105 and must be familiar with computer and related word processing and spreadsheet programs.*** (3+0)

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TM F225 **Cross Connections: Adapting and Integrating Principles of Management and Conservation**
3 Credits
Skills, abilities and knowledge needed to adapt traditional Western science and management principles to indigenous resource concepts and values are crucial when dealing with contemporary natural resource, land and environmental management issues in rural Alaska. To prepare students and provide tools and methods for considering cross-cultural concepts and values in resource management and conservation decisions. (3+0)

TM F250 **Current Topics in Tribal Government**
1 Credit
Various topics of current interest to Tribal Governments and Tribal Management students. Topics announced prior to each offering and course may be repeated for credit. (1+0)

TM F272 **Finance Applications for Rural Transportation**
1 Credit Offered as Demand Warrants
Prepares students and provides financial tools and methods for the management and oversight of rural government transportation programs. Familiarity with rural transportation issues and basic finance applications recommended. ***Prerequisites: TM F171. Recommended: TM F105.*** (21+0)

TM F273 **Transportation Improvement Programs and Control Schedules**
1 Credit Offered as Demand Warrants
Provides students with the basic skills to develop a Transportation Improvement Program (Tribal TIP) and a supporting Control Schedule for rural transportation programs. The course will cover the process and minimum requirements for developing a TIP, how to develop the supporting control schedule and how to tie the control schedule to internal budget processes. Emphasis will be placed on meeting the requirements for the Indian Reservation Roads program. ***Prerequisites: TM F272.*** (17+0)

TM F274 **Road Inventory Field Data System**
1 Credit Offered as Demand Warrants
Introduction to the BIA Road Inventory Field Data System (RIFDS). Students will learn to navigate RIFDS and to enter, modify, and delete inventory data. The relationship between RIFDS, other databases, and fund allocation will be examined. Students may apply for RIFDS access upon completion of course. Graded Pass/Fail. ***Prerequisites: Basic computer literacy equivalent to CIOS F100 and familiarity with the BIA Indian Reservation Roads program or permission of the instructor.*** (1+0)

TM F276 **Project Management for Rural Transportation**
4 Credits Offered as Demand Warrants
Introductory course on project management, focusing on transportation projects in rural Alaska. Designed for individuals familiar with rural transportation programs but new to project management. ***Prerequisites: TM F170 or TM F171; TM F172; TM F173; TM F174 or permission of instructor.*** (4+0)

TM F299 **Tribal Management Practicum II**
3 Credits
Professional and personal development while working in a rural service organization. Emphasis on developing the understanding and skills necessary for delivery of rural services. Course is guided by an academic advisor. Student must be willing and able to work independently outside the classroom and in the community. ***Prerequisites: Must be familiar with computer and related word processing and spreadsheet programs.*** (3+0)

VETERINARY SCIENCE

VTS F101 **Introduction to Veterinary Sciences**
2 Credits Offered Fall.
Concepts of lifelong learning, research skills, techniques of observation, occupational and zoonotic safety, veterinary ethics, teamwork with sponsoring veterinarian/clinic, value of professional organizations, and animals and animal care in Alaskan culture. There also is a hands on veterinary science wet lab (physical examination, suturing, IV fluids, and splints). Graded Pass/Fail. (1.5+0+1.5)

VTS F110 **Medical Terminology for Veterinary Sciences**
3 Credits Offered Fall.
Medical and prescription terminology as related to veterinary sciences. Some native Alaskan cultural perspectives on medical terminology included. (3+0)

VTS F130 **Animal Anatomy and Physiology for Veterinary Sciences**
4 Credits Offered Spring.
Explores the anatomy of the dog, cat, avian, cattle, hog, sheep, goat, horse, reindeer, muskox, and bison. The anatomy is approached from a functional standpoint (body systems) and includes the physiology of each body system. In addition, Alaskan native terms for anatomical structures may be given. ***Prerequisites: VTS F101 prior to or concurrently; high school biology or equivalent; or instructor approval.*** (3+3)

VTS F140 **Basic Animal Husbandry for Veterinary Sciences**
3 Credits Offered Spring.
Animal restraint, behavior, handling, species and breed identification, humane animal care, housing, management of farm animals, sled dog management, and reproduction. Species covered are canine, feline, goat/sheep, pig, horse, cattle, bison, reindeer, muskox, some exotics and lab animals. ***Prerequisites: VTS F101 prior to or concurrent with; or instructor approval.*** (2.5+1.5)

VTS F150 **Basic Animal Nutrition and Feeding for Veterinary Sciences**
3 Credits Offered Spring.
Nutritional analysis of feed, soil sampling and nutritional requirements of domestic animals (cattle, hogs, sheep, goat, horse, reindeer, bison, muskox, cat, dog). Also discusses feeding techniques, storage of feeds, feed contamination analysis. ***Prerequisites: VTS F101; high school biology or equivalent; DEVM F105 or equivalent; or instructor approval.*** (3+0)

VTS F160 **Animal Diseases for Veterinary Sciences**
3 Credits
Discusses the infectious and noninfectious diseases and treatment of companion animals, domestic production animals (including reindeer, muskox and bison), exotic and lab animals. ***Prerequisites: VTS F101; VTS F110; VTS F130; or instructor approval.*** (3+0)

VTS F161 **Introduction to Infectious Animal Diseases for Veterinary Science**
3 Credits Offered Spring
Topics include general pathology, etiology, pathogenesis, epidemiology, management and general treatment options. Species covered are dog, cat, horse, cattle, pig, sheep, goat, bison and reindeer. ***Prerequisites: VTS F110; VTS F130 or instructor approval.*** (4+0)

VTS F170 **Veterinary Office Management**
3 Credits Offered Spring
Basic introduction of business practices as they pertain to the management of the veterinary office and the role of the veterinary technician in that management team. Concepts include communications skills, record keeping, use of computers in veterinary practice, inventory and office management, and related issues of law and ethics. ***Prerequisites: Permission of instructor.*** (4+0)

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VTS F199 Veterinary Sciences Certificate Practicum I
2 Credits
On site participation at an approved large or small animal veterinary clinic, veterinary research laboratory, or fish and wildlife disease research project. Graded Pass/Fail. ***Prerequisites: VTS F101; VTS F130; VTS F140; VTS F160; or instructor approval.*** (0+6)

VTS F210 Pharmacology for Veterinary Sciences
2 Credits Offered Fall.
Introduction to the basics of pharmacology as applied to the veterinary sciences. Topics include the properties of different drug classes and their uses. Dosage calculation, measurement and administration as well as veterinary pharmacy management will be addressed. Alaskan traditional pharmacology and indigenous ethno-veterinary botanical knowledge will also be discussed. ***Prerequisites: VTS F110; VTS F130; VTS F160; or permission of instructor.*** (3+0)

VTS F220 Principles of Imaging for Veterinary Sciences
2 Credits Offered Spring.
Principles of imaging as they pertain to the practice of veterinary technology. Fundamental understanding of equipment used in radiology (such as, film type, screens, development systems, x-ray machines), generation of x-rays, safety issues for both patients and operators, image formation, technique charts, artifacts, and darkroom techniques. Equipment maintenance and record keeping will also be addressed. ***Prerequisites: VTS F110; VTS F130; VTS F140; or permission of instructor.*** (3+0)

VTS F230 Theory of Veterinary Nursing Practice
3 Credits Offered Fall
Theory of practical aspects of nursing in a veterinary hospital such as taking patient history, obtaining and recording intake values, specimen collection, administration of medication, fluid therapy, and wound management. Nutrition of hospitalized patients, alternative and traditional nursing care topics will also be discussed. Both companion and large animal species will be addressed. The practical veterinary experience that leads to the expansion of student knowledge and builds proficiency of acquired skills through task specific exercises (i.e. patient restraint, patient assessment, patient therapeutics administration, husbandry, diagnostic specimen collection, fluid therapy, etc.) will occur during subsequent VTS courses, namely VTS F240 and VTS F299. ***Prerequisites: VTS F130; VTS F160; VTS F199; VTS F210; or permission of instructor.*** (4+0)

VTS F261 Introduction to Non-infectious Animal Diseases for Veterinary Sciences
3 Credits Offering Spring
A basic introduction to the study of non-infectious animal disease (e.g. endocrine, nutritional, immunologic, neoplastic, degenerative, developmental and genetics) for veterinary sciences. Basic pathologic mechanisms of diseases will be explored using common non-infectious animal disease examples. Species covered are cat, dog, horse, cattle, sheep, goat, pig, bison and reindeer. Topics: etiology, pathegenesis, management and general treatment options. ***Prerequisites: VTS F110; VTS F130; VTS F160 or permission of instructor.*** (3+0)

WELDING AND MATERIALS TECHNOLOGY

WMT F101 Introduction to Welding
4 Credits Offered as Demand Warrants
Introduction and orientation to the processes and procedures involved in the welding field including safe operational procedures for shielded metal arc welding (SMAW) (Stick), mixed inert gas (MIG), tungsten inert gas (TIG) and oxy-acetylene welding; in addition to the appropriate personal protective equipment (PPE) and terminology related to the welding industry. Special fees apply. (2+4)

WMT F102 Intermediate Welding
3 Credits
Continuation of WMT F101. ***Prerequisites: WMT F101.*** (2+2)

WMT F103 Welding I
3 Credits
Entry-level course in basic oxyacetylene, arc welding and flame cutting. Attendance at first two classes is mandatory. Special fees apply. (3+0)

WMT F105 Welding II
3 Credits
Arc welding techniques and basic MIG and TIG welding. Attendance at first two classes is mandatory. Special fees apply. ***Prerequisites: WMT F103 or permission of instructor.*** (3+0)

WMT F106 Heat Treating/Metal Finishing/Knife Making I
3 Credits
Heat treating, metal finishing. Build two knives, heat treat and finish. Special Conditions: Must have excellent hand-eye coordination. Attendance at first class is mandatory. Special fees apply. ***Recommended: WMT F117; WMT F241.*** (2+3)

WMT F116 Metal Forging
1-3 Credits
Metal forging brings back the old-school way of forming metal into useful hardware or tools. Students will use hand tools, forges, and anvils to fabricate various items out of metal. May be taken up to four times for a maximum of 6 credits. Attendance at first two classes is mandatory. Special fees apply. ***Recommended: WMT F103 or WMT F117.*** (1.5+5.5)

WMT F117 Oxy-Acetylene Welding and Cutting
3 Credits
Safe oxyacetylene welding techniques and procedures of common metals. Welding of these metals in flat, horizontal, vertical and overhead positions. Attendance at first two class meetings is mandatory. Special fees apply. (2+5)

WMT F130 Shielded Metal Arc Welding
1-3 Credits
All positions for multiple pass fillet welds. A maximum of 3 credits are awarded for successful completion of any of the four sections; 130A- Certif SMAW (1F); 130B-Certif SMAW (2F); 130C-Certif SMAW (3F); 130D-Certif SMAW (4F). Presented in competency-based manner. (1-3+0)

WMT F140 Metal Fabrication
1-3 Credits Offered as Demand Warrants
Metal fabrication done by hand and with the aid of equipment is the focus of this class. Plan, layout, bend, form raw metal and fabricate metal projects. May be repeated four times for a maximum of six credits. Attendance at first two classes is mandatory. Special fees apply. ***Prerequisites: WMT F103 or WMT F160 or WMT F241.*** (1.5+5.5)

WMT F150 Gas Tungsten Arc Welding
1-3 Credits
Use of tungsten and argon gas for aluminum and stainless steel gas welding (formerly called Heliarc or TIG. This is an entry level gas tungsten arc welding class concentrating on aluminum. Materials will be welded in all four welding positions. Special fees apply. (1.5+5.5)

WMT F160 Gas Metal Arc Welding
1-3 Credits Offered as Demand Warrants
Prepares student to work with wire-feed processes. Gas metal arc welding focuses on ferrous and nonferrous metals welded in all positions. Attendance at first two classes is mandatory. Special fees apply. (1.5+5.5)

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WMT F170 Military Training Welding I
3 Credits
Entry-level oxyacetylene welding, cutting, soldering and brazing. Conforms to special training standards labeled 3E3X1. Uses parts of CDC 55250A volume #5 as a guide. Special fees apply. ***Prerequisites: Permission of instructor.*** (2+4.5)

WMT F206 Heat Treating/Metal Finishing/Knife Making II
3 Credits
Second level of knife making and heat treating using more complex metals and additional equipment. Must have excellent hand-eye coordination. Attendance at first class is mandatory. Special fees apply. ***Recommended: WMT F106; WMT F117; WMT F241.*** (2+2)

WMT F210 Pipe Welding
3 Credits
Prepare and weld pipe in an uphill or downhill position. Special fees apply. ***Prerequisites: Permission of instructor.*** (2+3.5)

WMT F241 Gas Tungsten Arc and Gas Metal Arc Welding
3 Credits
Entry-level gas tungsten arc welding concentrating on aluminum. Materials will be welded in all positions. Gas metal arc welding focuses on ferrous and nonferrous metals welded in all positions. Attendance at first two class meetings is mandatory. Special fees apply. (1.5+5.5)

WMT F270 Military Training Welding II
3 Credits
Conforms to special training standards parts 1 - 4 of CDC 55250A volume #6. Special fees apply. ***Prerequisites: WMT F170 or permission of instructor.*** (2+4.5)

WMT F280 Military Training Welding III
3 Credits
Intermediate TIG and MIG welding. Fabrication with aluminum and steel. Real world situations and conditions are simulated. Special fees apply. ***Prerequisites: WMT F170; WMT F270; or permission of instructor.*** (2+4.5)

WMT F290 Welding Proficiency Maintenance
3 Credits
Maintenance of a high degree of welding proficiency through practice of previously-learned processes. Review of safety procedures. Special fees apply. ***Prerequisites: WMT F170; WMT F270; WMT F280; or permission of instructor.*** (2+4.5)

WILDLIFE

WLF F101 Survey of Wildlife Science
1.5 Credits Offered Fall
An introduction to wildlife biology for conservation and management. Lectures will describe the research of local wildlife biologists and the programs of management agencies. Weekend field trips will be used to introduce practical problems and approaches in wildlife science. (1+0+1.5)

WLF F201 Wildlife Management Principles
3 Credits Offered Spring
Application of ecological principles to the study and management of wildlife populations and their habitat. Management of game and non-game species considered. Computer exercises explore population dynamics, habitat use and exploitation strategies. ***Prerequisites: BIOL F271; WLF F101; NRM F101. Recommended: Previous microcomputer experience.*** (2+3)

WLF F303 W Wildlife Management Techniques
3 Credits Offered Fall
Study of procedures used by wildlife biologists and managers to collect, analyze and disseminate information. Topics include using wildlife literature and scientific writing; behavioral sampling; nomenclature, identification, and sexing and aging of wildlife; census methods; habitat evaluation and manipulation; biotelemetry; home range; food habits and modeling; and necropsy procedures, animal condition and wildlife diseases. Term paper required. ***Prerequisites: BIOL F271; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; WLF F201 or equivalent.*** (2+3)

WLF F304 Wildlife Internships
1-3 Credits
Practical experience in wildlife management in public or private agencies. Projects are approved by faculty member and supervised by professional agency staff. May not be substituted for courses required for major. ***Prerequisites: Permission of instructor.*** (1-3+0)

WLF F305 Wildlife Diseases
3 Credits Offered Spring Odd-numbered Years
Basic concepts of parasitic, infectious, environmental and nutritional diseases. Specific study of Alaska wildlife diseases. Basic necropsy technique and chemical immobilization. ***Prerequisites: BIOL F115X and BIOL F116X or equivalent; or permission of instructor. Recommended: BIOL F310; BIOL F317.*** (2+3)

WLF F410 Wildlife Populations and Their Management
3 Credits Offered Fall
Characteristics and ecology of wildlife populations and the knowledge necessary for their wise management. Measures of abundance, dispersal, fecundity and mortality, population modeling, competition and predation, and the management of rare species and their habitats. ***Prerequisites: BIOL F271; calculus course; introductory STAT course; WLF F303 or BIOL F471.*** (2+3)

WLF F419 O/2 Waterfowl and Wetlands Ecology and Management
4 Credits Offered Fall Odd-numbered Years
Ecology of waterfowl and associated wetland habitats. Management of populations, including harvest and manipulation of habitats. Distribution, abundance, taxonomy and identification of North American waterfowl. Special fees apply. ***Prerequisites: BIOL F271; BIOL F426; COMM F131X or COMM F141X; WLF F201; or permission of instructor.*** (3+3)

WLF F421 Ecology and Management of Large Mammals
3 Credits Offered Fall Even-numbered Years
Identification, taxonomy, distribution, life history and ecology of North American large mammals. Exploration of roles of reproduction, predation, nutrition, habitat alteration and competition in population dynamics of large mammals, and management practices designed for conservation of habitats and populations. ***Prerequisites: BIOL F271; WLF F201 or permission of instructor. Recommended: WLF F303.*** (3+0)

WLF F431 Wildlife Law and Policy
3 Credits
Study of laws and agencies shaping wildlife management in North America. History and current status of major policy issues. Organization of and funding sources for state and federal programs in wildlife conservation. ***Prerequisites: WLF F201 or permission of instructor.*** Cross-listed with NRM F431. (3+0)

WLF F433 Conservation Genetics
3 Credits Offered Spring
Concepts of population genetics, phylogenetics, pedigree analysis, systematics and taxonomy as they apply to conservation of species. Evaluating the impact of small population size, population fragmentation, inbreeding, hybridization, taxonomic uncertainties and other factors on viability and management of species. ***Prerequisites: BIOL F271 and BIOL F362 or equivalents; or permission of instructor. Recommended: BIOL/NRM F277.*** Cross-listed with BIOL F433. Stacked with BIOL F633; WLF F633. (3+0)

WLF F458 Vertebrate Endocrinology
3 Credits Offered Fall Odd-numbered Years
Introduction to the mechanisms of action and the roles of the main hormonal systems that operate in vertebrates. Hormone effects at the organ, tissue, and (sub)cellular levels. Hormonal control of homeostasis and of specific behaviors. Examples to be taken mostly from recent comparative studies.

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Prerequisites: BIOL F310 or permission of instructor. Cross-listed with BIOL F458. (3+0)

WLF F460 O/2 Wildlife Nutrition
4 Credits Offered Fall
The energy nutrient requirements of vertebrate animals in relation to the ecology, physiology and life history. Concepts and techniques used by wildlife biologists to understand relationships between wild animals and their habitats. Techniques for constructing energy and nutrient budgets of wild animals and applications of these budgets to population level processes and habitat management. ***Prerequisites: COMM F131X or COMM F141X; BIOL F271; BIOL F310; or permission of instructor.*** Cross-listed with BIOL F459. Stacked with BIOL F659; WLF F660. (3+3)

WLF F469 O Landscape Ecology and Wildlife Habitat
3 Credits Offered Spring
A problem-based learning and critical thinking approach to modern methods in landscape ecology, including geographic information systems, remote sensing, modeling, software, and the Internet. Graduate students are expected to help undergraduates with problems and questions. Special fees apply. ***Prerequisites: BIOL F271 or equivalent; COMM F131X or COMM F141X.*** Cross-listed with BIOL F469. Stacked with BIOL F669; WLF F669. (2+3)

WLF F485 Global Change Biology
3 Credits Offered Fall Odd-numbered Years
Contemporary science and policy concerns of global change that involve biological processes. Includes structural and functional responses and sensitivities of biological processes to environmental changes (such as climate and human uses of land and biological resources); implications of biological responses to global change for conservation and management of biological resources; and the social and economic consequences of biological responses to global change. ***Prerequisites: BIOL F271; CHEM F105X; CHEM F106X.*** Cross-listed with BIOL F485. (3+0)

WLF F602 Research Design
3 Credits Offered Fall
An introduction to the philosophy, performance and evaluation of hypothetical/deductive research in the biological sciences, with emphasis on hypothesis formulation and testing. Each student will develop a research proposal. ***Prerequisite: Graduate standing or permission of instructor.*** Cross-listed with BIOL F602. (3+0)

WLF F603 Biotelemetry
3 Credits Offered Fall Even-numbered Years
An introduction to the basics of radio and ultrasonic telemetry and their application to the study of the ecology, behavior and physiology of vertebrates in terrestrial freshwater and marine environments. Review of concepts, equipment demonstration and a class project to expose students to an important tool for biological fisheries and wildlife investigations. ***Prerequisites: Graduate standing; or senior with instructor approval.*** (2+3)

WLF F614 Foraging Ecology
2 Credits Offered Fall Even-numbered Years
The dynamics of herbivory, emphasizing the foraging process and including mechanisms of feeding, feeding behavior, habitat and plant selection, physiological influences on feeding, plant and community level responses, plant defenses against herbivory and management of plant-herbivore systems. ***Prerequisites: Graduate standing or approval of instructor.*** Cross-listed with BIOL F614. (2+0)

WLF F622 Current Issues in Conservation Biology
3 Credits Offered Spring Odd-numbered Years
Critical discussion of contemporary issues concerning extinction patterns, population viability and the preservation, design and management of habitats for populations/species of concern. Stresses integration of principles and policies into strategies for biological conservation. ***Prerequisites: BIOL F471 or WLF F410; graduate standing; or permission of instructor.*** Cross-listed with BIOL F622. (3+0)

WLF F625 Analysis of Vertebrate Population Survival and Movement
3 Credits Offered Spring Odd-numbered Years
Contemporary methods of estimation of fundamental population parameters, survival and movement, with their implications for management. Focus will be on assumptions and methodology of estimation techniques. State-of-the-art computer applications will be employed in laboratory exercises of actual and simulated data. ***Prerequisites: BIOL F271; STAT F401.*** Cross-listed with FISH F625. (2+3)

WLF F633 Conservation Genetics
3 Credits Offered Spring
Concepts of population genetics, phylogenetics, pedigree analysis, systematics and taxonomy as they apply to conservation of species. Evaluating the impact of small population size, population fragmentation, inbreeding, hybridization, taxonomic uncertainties and other factors on viability and management of species. ***Prerequisites: BIOL F271 and BIOL F362 or equivalents or permission of instructor. Recommended: BIOL/NRM F277.*** Cross-listed with BIOL F633. Stacked with BIOL F433; WLF F433. (3+3)

WLF F660 Wildlife Nutrition
4 Credits Offered Fall
The energy nutrient requirements of vertebrate animals in relation to their ecology, physiology and life history. Concepts and techniques used by wildlife biologists to understand relationships between wild animals and their habitats. Techniques for constructing energy and nutrient budgets of wild animals and applications of these budgets to population level processes and habitat management. Special fees apply. ***Prerequisites: BIOL F271; BIOL F310; graduate standing; or permission of instructor.*** Cross-listed with BIOL F659. Stacked with BIOL F459; WLF F460. (3+3)

WLF F669 Landscape Ecology and Wildlife Habitat
3 Credits Offered Spring
A problem-based learning and critical thinking approach to modern methods in landscape ecology, including geographic information systems, remote sensing, modeling, software, and the Internet. Graduate students are expected to help undergraduates with problems and questions. Special fees apply. ***Prerequisites: Graduate standing.*** Cross-listed with BIOL F669. Stacked with BIOL F469; WLF F469. (2+3)

WLF F680 Data Analysis in Biology
3 Credits Offered Fall Even-numbered Years
Biological applications of nonparametric statistics, including tests based on binomial and Poisson distributions, analysis of two-way and multiway contingency tables, and tests based on ranks; multivariate statistics, including principal component analysis, ordination techniques, cluster and discriminate analysis; and time-series analyses. Introduction to the use of the computer and use of statistical packages. Each student will analyze a data set appropriate to the student's research interests. ***Prerequisites: STAT F200X, STAT F401; graduate standing in a biologically oriented field; or permission of instructor.*** Cross-listed with BIOL F680. (2+3)

WLF F692 Graduate Seminar
1-6 Credits
Topics in fish and wildlife management explored through readings, talks, group discussions and guest speakers with a high level of student participation. Graded Pass/Fail. ***Prerequisites: Graduate standing or permission of instructor.*** (0+0+1-6)

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WOMEN'S STUDIES

WMS F201 **Introduction to Women's and Gender Studies** (s)
3 Credits
An interdisciplinary introduction to the field of women's and gender studies, exploring its development, subject matter and methodology. Readings from studies that have become classic examples of the importance of gender in research in many disciplines are examined. Also available through the Center for Distance Education. (3+0)

WMS F202 **History of Women in America** (s)
3 Credits
A chronological approach to the history of women in America. Introduction to major issues of concern to historians of women, as well as different approaches used in analysis of women's past. Consideration of multiracial backgrounds of American women. Cross-listed with HIST F202. (3+0)

WMS F308 W,O **Language and Gender** (s)
3 Credits
Examination of relationships between language and gender, drawing on both ethnographic and linguistic sources. Topics include power, socialization and sexism. ***Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor.*** Cross-listed with ANTH F308; LING F308. (3+0)

WMS F320 **Sociology of Gender** (s)
3 Credits
Comprehensive survey of sociological inquiry and feminist revisions for studying gender in U.S. society and culture. Interrogates the meanings of gender, and the interactional, cultural, organizational and institutional arrangements that underlie the social construction of gender and gender inequality. ***Prerequisites: One lower-division social science course, WMS F201, or permission of instructor.*** Cross-listed with SOC F320. (3+0)

WMS F325 **The History of Sexuality** (s)
3 Credits Offered Summer
The history of sexuality from a worldwide comparative perspective. Theories and debates about the history of sexuality in selected times and places, with an emphasis on the modern period. ***Prerequisites: HIST F100X; ENGL F211X or ENGL F213X.*** Cross-listed with HIST F325. (3+0)

WMS F331 W **Women's Voices in Japanese Literature** (h)
3 Credits
Selected novels, short stories, poems and diaries by Japanese women from the tenth century to the present which reveal the personal, social, aesthetic and intellectual concerns of women in different periods of Japanese history. Focus on the changing role of women in Japanese society, the role of women writers as social critics, and cross-cultural differences and similarities in women's issues. ***Prerequisites: ENGL F111X; ENGL F211X or F213X or permission of instructor; ENGL/FL F200X. Recommended: HIST F121, F122 or F331 recommended.*** Cross-listed with JPN F331. (3+0)

WMS F332 **Human Sexualities Across Cultures** (s)
3 Credits Offered Alternate Fall Odd-numbered Years
Exploration of how people in a variety of cultures, both contemporary and historical, construct the meaning and experience of sexuality and express themselves as sexual beings. Interdisciplinary study includes psychology, sociology, anthropology, gender studies and related fields, with particular focus determined by which department is offering the course. Also available through the Center for Distance Education. ***Prerequisites: SOC F100X or SOC F201 or PSY F101 or WMS F201 or permission of instructor.*** Cross-listed with PSY F333; SOC F333. (3+0)

WMS F333 **Women's Literature** (h)
3 Credits
Reading, discussing and analyzing literary works dealing with the social, cultural and political implications of patriarchal structures and traditions from the perspective of feminist theory and criticism. Focus may be on a particular theme, period or genre, but readings will include both primary and secondary texts. ***Prerequisites: ENGL F111X. Recommended: ENGL F211X.*** Cross-listed with ENGL F333. (3+0)

WMS F335 W **Gender and Crime**
3 Credits
An exploration of gender and crime including the extent of female crime, victimization, masculinities and violence, and women professionals in the justice system. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X or permission of instructor; JUST F110; junior standing.*** Cross-listed with JUST F335. (3+0)

WMS F340 **Women and Politics** (s)
3 Credits
In-depth examination of the relevance of gender in political thought and action. Topics vary and may include: historical perspective of political ideas on the nature and status of women; women's involvement in national and/or international political movements and organizations; feminist approaches to the social sciences; feminism as a political ideology. ***Prerequisites: One political science course or permission of instructor. Recommended: WMS F201.*** Cross-listed with PS F340. (3+0)

WMS F348 W **Native North American Women** (s)
3 Credits
Interdisciplinary examination of the relationship between Native American women and their social settings and cross-cultural experiences. Includes issues of political, economic and social solutions as employed by women in a large multi-ethnic nation-state. ***Prerequisites: ANS F101; ANTH F100X; ENGL F111X; ENGL F211X or ENGL F213X; SOC F100X; or permission of instructor.*** Cross-listed with ANS F348. (3+0)

WMS F350 W **Women's Issues in Social Welfare and Social Work Practice** (s)
3 Credits
Examination of theories and research concerning women's issues in the field of social work and in the social welfare system, with particular emphasis on women in poverty and women of color. Contemporary policy issues and strategies of empowerment will be covered. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; SWK F103 or SOC F100X; or permission of instructor.*** Cross-listed with SWK F350. (3+0)

WMS F351 **Gender and Communication** (s)
3 Credits
Basic socialization differences exist in the communication practices of women and men in every culture, resulting in differing cultural constructions of male and female gender. Those differences are addressed in interpersonal, organizational and cultural contexts. Explores cultural female/male dichotomy as well as individual similarities. ***Prerequisites: Any lower-division communication course or permission of instructor.*** Cross-listed with COMM F351. (3+0)

WMS F360 O **Psychology of Women Across Cultures** (s)
3 Credits
Major theories, research and empirical data which describes the psychology of women as a discrete field, philosophical values of feminism and history of women's roles in society. The impact of culture on women interpersonally and intrapsychically examined across cultures. ***Prerequisites: COMM F131X or COMM F141X; PSY F101; or permission of instructor.*** Cross-listed with PSY F360. (3+0)

WMS F362 **Feminist Philosophy** (h)
3 Credits
Examination of contemporary feminist philosophical positions. Emphasis on feminist ethics, social and political philosophy, and epistemology. Cross-listed with PHIL F362. (3+0)

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WMS F380 O **Women, Minorities and the Media** (h)
3 Credits
Examination of how women and minorities are portrayed in the mass media, the employment of women and minorities in the media, and how accurately the media reflects our society demographically. Presented from a feminist, multi-culturalist perspective using a broad feminist analysis encompassing issues of gender as well as class, race, age and sexual orientation. Special fees apply. ***Prerequisites: COMM F131X or COMM F141X; junior standing.*** Cross-listed with JRN F380. (3+0)

WMS F410 W **Women in Music History** (h)
3 Credits
Lives and works of female musicians, composers and performers will be traced from the earliest days of the ancient and mythological through the medieval, Baroque Classical, and Romantic periods with special emphasis on composers of the 20th century. ***Prerequisites: ENGL F111X; ENGL F211X or ENGL F213X; junior standing or permission of instructor.*** Cross-listed with: MUS F410. (3+0)

WMS F414 **Women and Gender in East Asian History** (s)
3 Credits
Seminar on the history of East Asia with special emphasis on the experiences of women and the issue of gender. This seminar will focus on the modern period and on China and Japan especially, though other regions of East Asia may also be considered. ***Prerequisites: HIST F100X; ENGL F211X or ENGL F213X; or permission of instructor. Recommended: HIST F122 and/or HIST F275.*** Cross-listed with HIST F414. (3+0)

WMS F424 **Topics in Women's History** (s)
3 Credits Offered Spring Odd-numbered Years
An in-depth seminar on a specific topic of current interest. Topics may change and may cover the history of European or American women from the 18th century to the present. Course may be repeated for credit when content varies. ***Prerequisites: A lower-division history course; junior standing; or permission of instructor.*** Cross-listed with HIST F424. (3+0)

WMS F440 **Gender and Education** (s)
3 Credits Offered Alternate Spring Even-numbered Years
Educational practices and processes and their relation to the changing situation of women in society. Examination of schools as sites of pervasive gender socialization and discrimination as well as offering new possibilities for liberation. Topics include social construction of gender; patterns of access and achievements; gender as an organizing principle in schools and classrooms; and feminist agendas and strategies for change. ***Prerequisites: Junior standing or permission of instructor.*** Cross-listed with ED F440. Stacked with ED F640. (3+0)

WMS F445 **Gender in Cross-Cultural Perspective** (s)
3 Credits
Gender as cultural construction and social relationship is examined through readings in comparative ethnographies portraying gender roles in a broad variety of societies, from hunter-gatherer to industrial. New theoretical and methodological approaches in anthropology for exploring and understanding women's and men's experiences in their cultural variety are presented. ***Prerequisites: ANTH F215 or WMS F201 or permission of instructor.*** Cross-listed with ANTH F445. Stacked with ANTH F645. (3+0)

WMS F460 **Women and Development** (s)
3 Credits
Explores interrelationships over time of women, gender roles and development in the dynamic global economy, including issues in Alaska and the circumpolar north. Examines the historical marginalization of women in developmental processes, special issues affecting women in indigenous communities, and changing socio-economic and cultural gender roles of women and men in community development. Examines life histories of women that illustrate emerging principles and strategies for individual and community empowerment. Cross-listed with RD F460. (3+0)

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