

University of Alaska

CATALOG 1966 - 1967

Our cover shows the central academic
core of the University of Alaska
main campus. Color photograph by
Larry Crackel.

Catalog

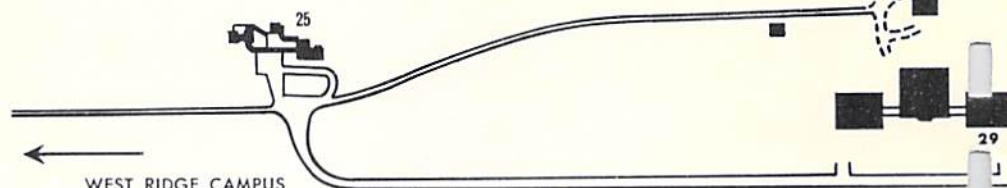
University of Alaska 1966-67

College, Alaska

Second Series, No. 32

THE UNIVERSITY OF ALASKA Central Campus

COLLEGE, ALASKA

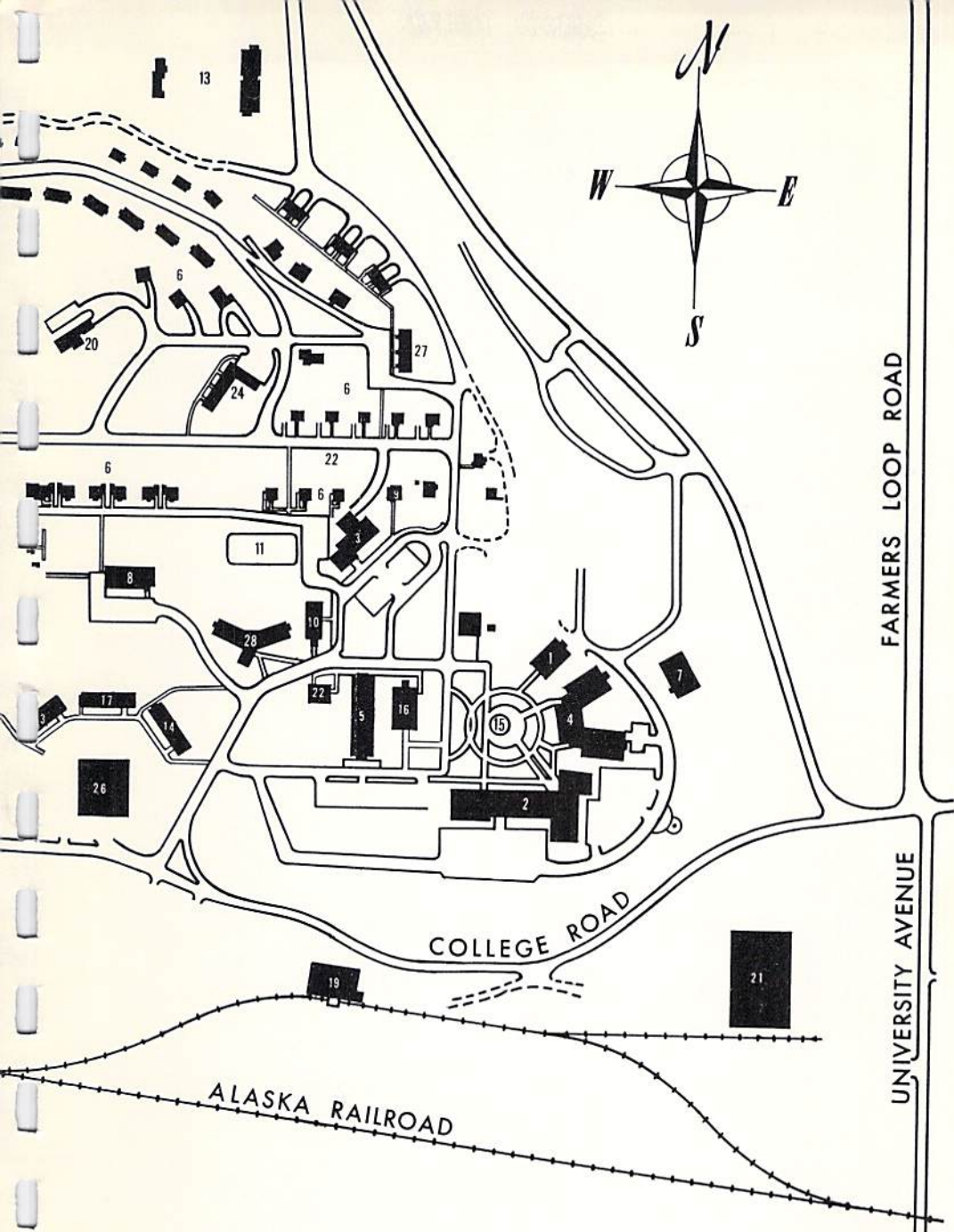


WEST RIDGE CAMPUS

Alaska Water Laboratory
Biological Sciences Building
Arctic Health Research Center

Buildings

- (1) BROOKS BUILDING — Classrooms, laboratories, offices for College of Earth Sciences and Mineral Industry
- (2) BUNNELL BUILDING — General Administrative offices, classrooms, library, Schaible Lecture Hall, Computer Center, offices of College of Arts and Letters and College of Biological Sciences and Renewable Resources.
- (3) CONSTITUTION HALL (Student Union) — Student activities offices, snack bar, alumni services, bookstore
- (4) DUCKERING BUILDING — Classrooms, laboratories, offices of College of Mathematics, Physical Sciences and Engineering, College of Business, Economics, and Government, Institute of Marine Science, Institute of Arctic Biology
- (5) EIELSON BUILDING — Classrooms, laboratories, offices of College of Behavioral Sciences and Education
- (6) FACULTY HOUSING
- (7) FOREST RESEARCH LABORATORY
- (8) GEOPHYSICAL INSTITUTE
- (9) HEALTH SERVICE CENTER
- (10) HESS HALL, HARRIET — Dormitory
- (11) ICE RINK
- (12) LATHROP HALL, AUSTIN E. — Dormitory
- (13) MARRIED STUDENTS APARTMENTS (New)
- (14) McINTOSH HALL, JOHN E. — Dormitory
- (15) MEMORIAL PLAZA
- (16) MUSEUM — Upper floor houses music facilities
- (17) NERLAND HALL, ANDREW — Dormitory
- (18) PATTY BUILDING — Gymnasium, pool, ROTC, Rifle Range
- (19) POWER PLANT
- (20) PRESIDENT'S RESIDENCE
- (21) SERVICES BUILDING
- (22) STATEWIDE SERVICES BUILDING — Administrative offices
- (23) STEVENS HALL, MORTON — Dormitory
- (24) STUART HALL — Faculty apartments



- (25) U.S. COAST AND GEODETIC SURVEY—Observatory houses seismograph installation for the continuous registration of earth tremors
- (26) UNIVERSITY COMMONS — Dining facility for all dormitory residents
- (27) WALSH HALL — Married students apartments
- (28) WICKERSHAM HALL — Dormitory
- (29) WOMEN'S DORMITORY (New)



University Calendar

1966 Summer Session

Short Session	June 6-June 24, 1966
Regular Session	June 27-August 5, 1966
Post Session Workshop	August 8-August 12, 1966

Proposed 1966-67 Academic Year Calendar

Labor Day	Mon., Sept. 5
Dormitory Rooms Open	Noon Sat., Sept. 3
Orientation and Guidance Testing for New Students	8:00 a.m. Tues., Sept. 6
General Faculty Convocation	through Sunday, Sept. 11
Faculty Meetings (Academic Colleges)	10:00 a.m. Thurs., Sept. 1
Faculty Meetings (Departmental)	2:30 p.m. Thurs., Sept. 1
Counselling of Students by Advisers	9:30 a.m. Friday, Sept. 2
Registration	Noon Thurs., Sept. 8
New Students	through 5:00 p.m. Fri., Sept. 9
Returning Students	8:00 a.m. to 5:00 p.m. Sat., Sept. 10
(meal tickets effective Dinner Monday, Sept. 12)	8:00 a.m. to 5:00 p.m. Mon., Sept. 12
Instruction Begins	8:00 a.m. Tues., Sept. 13
Registration Closes	5:00 p.m. Mon., Sept. 26
Last Day to Withdraw without Grade	5:00 p.m. Mon., Sept. 26
Last Day for Making Up Incompletes	5:00 p.m. Mon., Oct. 24
Six Week Grade Reports	Wed., Oct. 26
Thanksgiving Recess	Begins 5:00 p.m. Wed., Nov. 23
Christmas Recess	to 8:00 a.m. Mon., Nov. 28
Last Day for Student-Initiated Withdrawals	Begins 5:00 p.m. Sat., Dec. 17, 1966
Examination Study Period (No Classes)	to 8:00 a.m. Mon., Jan. 2, 1967
Semester Examinations	Tues., Dec. 20
Final Grades on File with Registrar	Wed., Jan. 11
End of Fall Semester	8:00 a.m. Thurs., Jan. 12
Final Grades on File with Registrar	to Noon Wed., Jan. 18
End of Fall Semester	Noon Thurs., Jan. 19
End of Fall Semester	5:00 p.m. Fri., Jan. 20

1966-67 Spring Semester

Dormitory Rooms Available	Noon Wed., Jan. 18
Orientation and Guidance Testing for New Students	9:00 a.m. Thurs., Jan. 19
Counselling of Students by Advisers	to 5:00 p.m. Fri., Jan. 20
Registration	Noon Thurs., Jan. 19
Instruction Begins	to 5:00 p.m. Fri., Jan. 20
Registration Closes	8:00 a.m. to 5:00 p.m. Mon., Jan. 23
Last Day to Withdraw Without Grade	8:00 a.m. Tues., Jan. 24
Last Day for Making Up Incompletes	5:00 p.m. Mon., Feb. 6
Six Week Grade Reports	5:00 p.m. Mon., Feb. 6
Spring Recess	5:00 p.m. Mon., Mar. 6
Last Day for Student-Initiated Withdrawals	Wed., Mar. 8
Last Day to Submit Graduate Thesis	Begins 5:00 p.m. Wed., Mar. 16
Campus Day	to 8:00 a.m. Mon., Mar. 21
Governor's Day	Wed., Apr. 19
Examination Study Period (No Classes)	5:00 p.m. Thurs., Apr. 27
Semester Examinations	Sat., April 30
Final Senior Grades on File with Registrar	Sat., May 6
End of Spring Semester	Thurs., May 11
Final Grades on File with Registrar	8:00 a.m. Fri., May 12
Baccalaureate	to Noon Thurs., May 18
Commencement	9:00 a.m. Fri., May 19
Commencement	5:00 p.m. Fri., May 19
Commencement	5:00 p.m. Fri., May 19
Commencement	Sun., May 21
Commencement	Mon., May 22

1967 Summer Session (Tentative)

Short Session	June 5-June 23, 1967
Regular Session	June 26-August 4, 1967
Post Session Workshop	August 7-August 11, 1967

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Sources Of Information

General News Information	University Relations
Admissions and Dormitory Applications	Director of Admissions and Registrar
Scholarships and Loans	Director, Student Affairs
Part-Time Employment	Head, Student Services
Graduate Work	Vice President for Research and Advanced Study
Summer Sessions	Head, Summer Sessions, Conferences and Short Courses
Alumni Association	Head, Alumni Services and Graduate Placement
Agriculture Information	Cooperative Extension Service
Mining Information	Dean, College of Earth Sciences and Mineral Industry
Wildlife Information	Cooperative Wildlife Research Unit
Off-Campus Educational Programs	Dean, Division of Statewide Services
Anchorage Community College	Director 1602 W. Hillcrest Anchorage, Alaska
Ketchikan Community College	Director Box 378 Ketchikan, Alaska
Juneau-Douglas Community College	Director 1250 Glacier Avenue Juneau, Alaska
Matanuska-Susitna Community College	Director Box 1406 Palmer, Alaska
Sitka Community College	Director Box 179 Sitka, Alaska
Kenai Peninsula Community College	Director Box 539 Kenai, Alaska
Mailing Address for Main Office:	University of Alaska College, Alaska 99735

TRANSPORTATION TO THE UNIVERSITY

The University of Alaska is located at College, Alaska, five miles from Fairbanks. Bus service is available a number of times each day between Fairbanks and College. Taxi service is also available.

Fairbanks is served by major airlines from all main points in Alaska and from Seattle. It is the northern terminus of the Alaska Railroad running from Anchorage. It is possible to travel by bus or automobile over the Alaska Highway.



On a hill, the campus is reached from many directions. This approach is called by some, "78 steps to knowledge."

General Information

HISTORY

The University dates from 1915, when on July 4 the Hon. James Wickersham, delegate to Congress from Alaska, laid the cornerstone on land set aside by Congress, on March 14, for the support of a Territorial College and School of Mines. The Territorial Legislature by its Acts of May 3, 1917, accepted the land grant and created a corporation, "The Alaska Agricultural College and School of Mines," defining its duties and providing for a Board of Trustees consisting of eight members.

The College opened for instruction on September 18, 1922, with the Hon. Charles E. Bunnell as president. The college became the University of Alaska by Act of the Territorial Legislature, July 1, 1935; the Board of Trustees became the Board of Regents. The University offered its first summer session in 1947. In 1949, Dr. Terris Moore succeeded the late President Bunnell, who became President Emeritus.

Dr. Ernest N. Patty, member of the first faculty of the Alaska Agricultural College and School of Mines and former Dean of the College, was inaugurated as the third president of the University in 1953 and named President Emeritus upon his retirement in 1960, when Dr. William R. Wood became the fourth president.

OBJECTIVES OF THE UNIVERSITY

Truly unique among institutions of higher learning in the United States, the University of Alaska serves, within the scope of its resources, all of the public educational needs, beyond high school, of an entire state.

When the Legislature established Alaska's state university, it joined with the national government to make it also a land-grant university with a fivefold function:

To instruct youth and adults seeking higher learning in the liberal arts, the sciences and the professions;

To increase and apply, through research, knowledge of value to mankind, and particularly to the residents of the State;

To serve the people throughout the 586,400 square miles of Alaska as an intellectual, scientific, and cultural resource;

To provide and to develop competent leadership for the people of Alaska in their continued improvement of the State as a good region in which to live;

To strive above all, to develop in its students, at all levels, those qualities of mind and body which are necessary for life as a worthy human being in a democratic society.

ACCREDITATION

The University is accredited as an institution of higher learning by the Northwest Association of Secondary and Higher Schools; belongs to the Association of American Colleges, the Association of State Universities and Land-Grant Colleges, and the National Commission of Accrediting; and has institutional membership in the American Council of Education, the American Association of Colleges for Teacher Education and the Western Interstate Commission for Higher Education.

The four-year curriculums in Civil Engineering, Mining Engineering, Electrical Engineering and Geological Engineering are accredited by the Engineers' Council for Professional Development. The Council represents the principal engineering societies and examining boards of the United States and Canada.

The University is approved by the Federal Office of Vocational Education for teacher-training in Vocational Home Economics. It is also on the approved list of colleges and universities of the American Association of University Women.

CARNEGIE CORPORATION GRANT

The Carnegie Corporation of New York has awarded the University a grant of \$150,000 for the purpose of bringing to the University outstanding visiting professors in the humanities and social sciences. This is the sixth year of the grant. The visiting professors will be specialists in such subjects as music, art, linguistics, English, philosophy, psychology, history, economics, and political science.

CAMPUS BUILDINGS AND FACILITIES AT COLLEGE, ALASKA

Administrative and Classroom Buildings—The *Bunnell Memorial Building*, dedicated to the late Charles E. Bunnell, first president of the University, consists of general administrative offices, classrooms, the Computer Center, laboratories, a large lecture hall, and the library. It also includes offices of the College of Arts and Letters.

The *Brooks Memorial Mines Building* provides space for classrooms, laboratories, and offices of the College of Earth Sciences and Mineral Industry; the Alaska State Division of Mines; the United States Geological Survey, and the United States Bureau of Mines. The four-story structure is dedicated to the late Dr. Alfred H. Brooks, chief Alaskan Geologist of the U.S. Geological Survey from 1903 to 1924.

The *Biological Sciences Building*, completed in the winter of 1966, provides offices, research facilities and laboratories for upper division classes of the College of Biological Sciences and Renewable Resources. It also houses the Institute of Arctic Biology.

The *Eielson Memorial Building* contains general classrooms, laboratories and offices of the College of Behavioral Sciences and Education and the offices of the Division of Statewide Services.

The *William E. Duckering Building* houses offices, classrooms and laboratories of the College of Mathematics, Physical Sciences and Engineering, the College of Business, Economics and Government, the Institute of Marine Science, and laboratories of the State Highway Materials Division.

The *Ernest N. Patty Building*, dedicated to President-Emeritus Ernest N. Patty, includes a gymnasium, swimming pool, rifle range, classrooms and office facilities for the Department of Health, Physical Education and Recreation and the Department of Military Science.

The *Museum* exhibits more than 100,000 catalogued specimens of Eskimo and other artifacts in mineral, anthropological, ethnological, palaeontological, botanical, and natural history fields.

The *Geophysical Institute* is a three-story structure containing facilities for research in arctic and sub-arctic natural phenomena and for graduate instruction in geophysics.

The University Library—A variety of resources and services are available in the University Library. In addition to a good basic book collection, the library subscribes currently to approximately 1500 journals and a selection of newspapers—from Alaska, the other states and foreign countries.

Microforms, including microfilm, micro-card, and microfiche, and microform readers are housed in a separate room on the lower level of the library. Significant among the microform holdings are such items as the microfilm edition of *The New York Times* and the *Records of the Russian-American Company, 1802-1867*, and the microfiche edition of the *Human Relations Area File*.

Tables are also available on this level for individual listening to the non-circulating collection of phonograph records which the library maintains.

The University Library is a depository for publications of the United States Government and the Atomic Energy Commission. This extensive document collection is located on the library mezzanine.

The main floor of the library contains the special Skinner Collection of Alaskan and most of the reference collection, including important indexes.

A smoking area on this floor permits students to study or relax in comfortable, informal surroundings.

Books for which faculty may make special assignments are shelved in the Reserve Book Section which is also located on the main floor.

Interlibrary loan service for graduate students and faculty is handled from the administrative office of the library.

A subject library in the area of Geophysics, on the second floor of the Geophysical Institute Building, is open to those who have a need for such material.

ENROLLMENT SUMMARY 1965-66 First Semester

	<i>Men</i>	<i>Women</i>	<i>Total</i>
Freshmen	360	198	558
Sophomores	157	69	226
Juniors	109	56	165
Seniors	106	45	151
Graduates	66	33	99
Without Class Standing	84	123	207
*Transfers	68	40	108
Post Graduates	63	36	99
Total Number of Students	1013	600	1613

ENROLLMENT DISTRIBUTION 1965-66 First Semester

Alaska	1281
Other States and U.S. Possessions	287
Foreign Countries	45
Total	1613



The fountain in Memorial Plaza is a popular place for students to relax in summer, fall and spring.

Division of Statewide Services

The Division of Statewide Services makes available to residents of the State University courses, educational programs, and special services.

Community Colleges—The University of Alaska serves Alaska through six community colleges as well as the main campus at College.

The 1953 Legislature authorized the University to cooperate with qualified school districts in the establishment of community colleges. The first institution, Anchorage Community College, began operation February 8, 1953. The second college at Ketchikan began operation in the fall of 1954, the third at Juneau-Douglas in the fall of 1956, the fourth at Palmer in the fall of 1961, the fifth at Sitka in the fall of 1962, and a sixth at Kenai in 1964.

Through these colleges the University offers collegiate courses for academic credit. The courses and instructors are approved and supervised by the University. All University courses carry residence credit. In addition, each community college offers vocational and interest courses under the sponsorship of the local school district. These courses do not carry University credit.

For detailed information write to the Resident Director of the Community College in which you are interested.

Evening Classes and Correspondence Study—The Department offers residence credit courses on the main campus during the evening, at military installations, and in other locations throughout the state not served by a community college. A special catalog of the Department activities is available by writing to the Department of Evening Classes and Correspondence Study.

The Department also coordinates the grading of the United States Armed Forces Institute Correspondence Course Lessons submitted by military personnel in Alaska, and approves instructors for the Air Force Study Program.

A limited number of correspondence courses are offered. For information and a catalog write to the Department of Evening Classes and Correspondence Study.

Summer Sessions, Conferences and Short Courses—The University holds three- and six-week summer sessions on the campus at College and at most of the Community Colleges. A wide range of courses are offered for both graduate and undergraduate credit. Courses of study are open to both men and women who are (1) candidates for graduate or undergraduate degrees, or (2) unclassified students wishing to take special courses or desiring intellectual enrichment without reference to a degree. A maximum of seven hours of credit may be earned during the six-week session and three hours of credit may be earned during the three-week session.

Of special interest are various workshops, institutes, conferences and lectures conducted by specialists, with Alaskan aspects of the subjects presented when possible. A post-session Workshop on Alaska includes anthropology, education, history, literature, art, agriculture, and wildlife, consisting of lectures by authorities, demonstrations, and field trips.

Special workshops and institutes open to high school age students are also presented. These include the Music Camp, Creative Arts Camp, a Science Institute, and a Youth Leadership Conference.

The summer sessions faculty is composed of members of the regular University teaching staff, supplemented by outstanding visiting professors.

An extensive recreation program is planned for summer sessions students at College. Typical recreational activities include trips to Eskimo and Indian villages, gold-panning expeditions, hiking, dances, movies, and a riverboat excursion.

The Summer Sessions Catalog, which includes a listing of courses to be offered, is available after March 1 of each year from the Department of Summer Sessions, Conferences and Short Courses.

The University, through this Department, also conducts educational conferences and short courses throughout the State.

Summer Institutes—Proposals are prepared by University faculty members and submitted each year to various governmental agencies and private foundations which provide funds for special summer institutes. Under a grant from the National Science Foundation, an institute for teachers of science and mathematics and a summer training program for secondary school students has been held on campus each summer for several years. More recently, summer institutes for teachers of French and history were financed by the National Defense Education Act.

Summer Institutes are usually conducted for an eight-week term, and participants may ordinarily earn eight hours of credit. Institutes are usually open to both residents and non-residents of the state of Alaska.

Mining Extension Program—The Mining Extension Program, supported by state appropriations, consists of two short courses: a four-week or five-week basic prospecting course which emphasizes the various methods of prospecting; and a two-week geochemical prospecting course which emphasizes the use of chemical analysis in prospecting. These courses are offered each year in various communities in Alaska and are open to all persons without regard to previous training or academic qualifications.

The Mining Extension Courses are designed to give basic training in various phases of the mineral industry and to enable prospectors to find and explore ore deposits. An appropriate certificate is awarded to students who satisfactorily complete the respective course of study.

For additional information, contact the Department of Summer Sessions, Conferences and Short Courses, University of Alaska, College, Alaska.

Fisheries Extension Program—Fisheries Short Courses, covering various aspects of commercial fishing, are held in commercial fishing centers throughout the state. These courses present information on fishing gear and materials, fisheries technology, hydrology, biology and pollution. Courses taught in remote areas of the state include lectures and demonstrations on fisheries biology, fish spoilage, proper care of fish, netting materials used by fishermen, and maintenance of equipment. An appropriate certificate is awarded to students who satisfactorily complete the course.

For information contact the Department of Summer Sessions, Conferences and Short Courses, University of Alaska, College, Alaska.

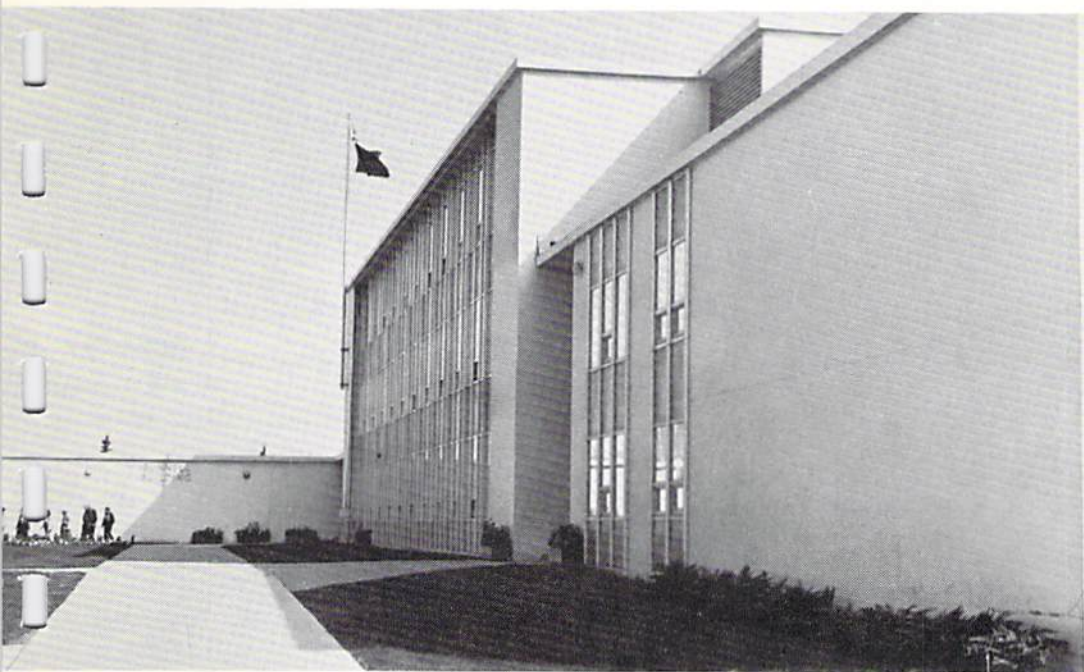
Cooperative Extension Service in Agriculture and Home Economics—The program is a cooperative educational service of the University and the United States Department of Agriculture. District offices and field staff are located in Fairbanks, Palmer, Juneau, Homer, Anchorage and Nome. University Extension specialists and district Extension agents extend the results of research by the University and USDA to the public. They help local people to identify and solve problems, and to apply the results of scientific research to the improvement of farms, homes and communities.

Extension's traditional audience has been rural people. Today, with no sharp dividing lines between rural and urban interests, Extension agents also serve consumer, marketing, and agri-business groups. They help citizens of the state to plan rural civil defense programs and to organize for broader economic and social development. Their teaching is carried out informally through television, radio, newspaper and newsletter media, publications, farm and home visits, special interest meetings, and short courses.

Audio-Visual Communications—The Department of Audio-Visual Communications is an all-University and State service which supports instruction.

The Department has a large collection of educational films, filmstrips, tapes and slides that are available to the University faculty, groups, and schools throughout the State.

Requests for the film catalog should be mailed to the Department of Audio-Visual Communications, University of Alaska, College, Alaska.



Four-story Bunnell Building houses administrative and faculty offices, library, classrooms and some laboratories.



Much graduate work and research centers on searching for new knowledge of the Arctic and Polar regions of the world.

Research and Advanced Study

The research programs of the University of Alaska take advantage of its unique location in the sub-arctic of interior Alaska, but with easy accessibility to the oceans from the Pacific to the Arctic; its accessibility to glaciers and permafrost areas; and its location near the auroral zone, the region in which maximum effects are seen from the bombardment of the earth by charged particles from the sun.

In addition to research which is carried out in the academic departments, the University has several institutes and associated activities.

Alaska Agricultural Experiment Station—With the United States Department of Agriculture the University conducts a joint agricultural research program in the State. A joint Director administers the program from the Experiment Station headquarters at Palmer in the Matanuska valley.

Field research is concentrated at the Matanuska Experiment Farm seven miles west of Palmer and at the Fairbanks Experiment Farm a mile west of the University. A fur experiment farm is also operated near Petersburg in southeastern Alaska. Because of varied environments found in Alaska, many plant and soil studies are scattered throughout the potential farming area, where the work is accomplished in cooperation with farmers and homesteaders.

Alaska Cooperative Wildlife Research Unit—The Unit is one of several located at land grant colleges and universities. The Alaska Unit is jointly sponsored and financed by the University of Alaska, the Alaska Department of Fish and Game, the U.S. Fish and Wildlife Service, and the Wildlife Management Institute. The Unit provides technical and profession training in wildlife management, research, education, and administration. The research program of the Unit includes ecological and management investigations of big game, waterfowl, furbearers, and upland game species.

Graduate work leading to the advanced degrees in wildlife management may be performed at the Unit in co-operation with the Department of Wildlife Management.

Geophysical Institute—The Institute was opened on July 1, 1949, as a department of the University. The 79th Congress of the United States had established the Institute, and the 80th Congress appropriated funds for the construction of the present laboratory and associated houses. The Geophysical Institute has grown from a modest program of auroral observations commenced in 1929 to its present activities embracing many fields of arctic and sub-arctic research.

The Institute's purpose is to advance knowledge of the earth and its environment in space. Emphasis is placed on studies of the upper atmosphere and the solar-terrestrial relationship using a network of ground

stations and rocket-borne instruments. Programs are also established in meteorology, glaciology, seismology, vulcanology and tectonic physics. In addition to the main office building located on the campus, the Institute operates a number of field sites in Alaska and elsewhere, and participates in Antarctic research. The present staff numbers approximately 180, including some 30 graduate students who obtain their research training at the Institute. Financial support is obtained mainly through Federal grants and contracts.

The Director of the Geophysical Institute is chosen by the Board of Regents upon the recommendation of the president of the University, subject to approval by the president of the National Academy of Sciences.

Institute of Arctic Biology—Pursuing recommendations as to its prospective national value by a committee of eminent biologists, the Institute was established by the Alaska Legislature in 1963 for studies of life in the extreme climatic changes of arctic and sub-arctic regions. The Laboratory of Zoophysiology, the first component, began operation in 1962 and is now staffed by some 25 persons. It is located in the new Biosciences Building with appropriate services and facilities for field and laboratory investigations on Alaskan animals. Facilities are in preparation for studies of man (human ecology) and plant (plant physiology) of arctic and sub-arctic environments. Visiting scientists are received in the laboratories to which their investigations pertain. Opportunities for pre- and post-doctoral studies are provided.

Institute of Marine Science—The Institute was authorized in 1960 by the State Legislature. Its purpose is the advancement of knowledge of the sea, with particular emphasis on problems of the northern regions. A program of education and research in biological, physical and chemical oceanography are all included within this broad scope. Sea-going and laboratory facilities are available at the Douglas Marine Station, situated some five miles from Juneau. Campus activities are centered in a new laboratory, completed in January, 1963. The Institute operates the 80-foot Research Vessel ACONA. Scientists are invited to request permission to work in residence.

Institute of Social, Economic and Government Research—The Institute was authorized by the State Legislature in 1961. Its purpose is to contribute to an advancement of knowledge in the fields of business, economics, and government with particular emphasis on conditions in Alaska and the northern part of North America.

Institute of Water Resources—The Institute was established in May, 1965, and is the youngest of the research institutes at the University.

The Institute has no building or laboratory facility as such but it administers and coordinates many of the water resources research projects which are carried out throughout the campus. The Institute staff works very closely with the other four institutes in addition to the departments of Chemistry, Geology, Environmental Engineering, Wildlife Management, etc.

Mineral Industry Research Laboratory—The 1963 Alaska State Legislature authorized the establishment of a mineral industry research program at the University of Alaska. The purpose of the Laboratory is to conduct

appropriate applied and basic research in various areas of the mineral industry that will aid in the further utilization of Alaska's mineral resources. Research is conducted in facilities of the College and co-ordinated with graduate student academic programs.

Arctic Research Laboratory, Point Barrow—Under contract with the Office of Naval Research the University operates the Arctic Research Laboratory. Laboratory facilities are maintained, and scientific teams from other universities and organizations carry on arctic research problems there.

More than 300 scientists from many of the leading universities of the world made use of the extensive facilities of the Arctic Research Laboratory last year.

STATE AND FEDERAL AGENCIES ON CAMPUS— ASSOCIATED WITH THE UNIVERSITY OF ALASKA

Alaskan Geology Branch of the U.S. Geological Survey—This branch conducts a program of geological exploration and research in Alaska. Some of the functions are areal geologic mapping; studies and evaluation of metallic, nonmetallic, coal, and oil deposits; regional studies of structure and stratigraphy; detailed studies of selected type-areas; application of geology to engineering and related problems; and research in the use of new geologic methods. The Alaskan Geology Branch office has a complete file of Alaskan maps and geological reports available to the public for use in the Office.

Alaska Department of Fish and Game—The purpose of the Alaska Department of Fish and Game is to assist in fish and game protection, research, restoration, propagation, and increase in the State of Alaska.

Until recently several biologists of the Department were stationed on the campus and it is hoped that suitable facilities will again be available for their use as a result of the current building program.

There is close collaboration between the University and the Department both in research and teaching (see Alaska Cooperative Wildlife Research Unit).

State Highway Testing Laboratory—The Alaska State Division of Highways operates a road materials laboratory in conjunction with the Department of Civil Engineering. The State provides equipment and personnel for routine testing of highway materials and for highway research.

U.S. Coast and Geodetic Survey—The College Magnetic and Seismological Observatory is operated by the United States Coast and Geodetic Survey, with the main facility on the west ridge of the University campus and an outpost facility on Grenac Road. Originally constructed in 1947, the Observatory has grown to 19 buildings and operates 28 instruments that continuously gather data for studies in the fields of geomagnetism and seismology.

The Observatory monitors seismic activity 24 hours a day and is part of the Pacific Seismic Sea Way Warning System with headquarters in Honolulu, Hawaii. It plays a great part in keeping the people of Alaska informed of current earthquake activity and informing scientific organizations of the occurrence of major world wide magnetic events.

During the last several years the Observatory has been participating in cooperative research projects with University scientists, (principally of the Geophysical Institute).

The Observatory is also responsible for overseeing the operation of the Barrow Magnetic Observatory at Point Barrow in cooperation with the University's Arctic Research Laboratory.

United States Forest Service—The Northern Forest Experiment Station has established a branch laboratory on the campus. A growing research staff is conducting investigations on forest management, fire, entomology, and other aspects of subarctic forest ecology. This laboratory is to be the center for the Station's activities in interior and northern Alaska; although field work is conducted throughout the region, many investigations will be centered on the Bonanza Creek Experimental Forest about 35 miles from campus.

The overall purpose of the research conducted by the Forest Experiment Stations is to supply the land manager with the most efficient means of growing, protecting and harvesting timber crops in a manner most compatible with other land uses.

Alaska Water Laboratory—This new 2.5 million dollar facility is a regional laboratory of the recently established Federal Water Pollution Control Administration (DHEW).

Research and technical assistance on water pollution problems of particular concern to Alaska are being investigated. The effect of wastes discharged by communities, rural families, native villages, fisheries, lumber, mining, and paper and pulp industries on humans and aquatic life are problems being considered by the professional staff. This laboratory is a part of the growing Arctic Research Center on the campus of the University of Alaska.

Arctic Health Research Center—Being built by the U.S. Public Health Service in the University's Arctic Research Center, this building is scheduled for completion in the fall of 1966.



By the fireplace in the Commons Lounge is a comfortable study area on winter evenings.

Financial Information

FEES AND EXPENSES

Summary of Semester Charges

Full-time Students

Residents:

University Fee	\$ 82.50
Campus Activity Fees	21.00
Recreational-Athletic Fee 4.50	
Associated Student Fee 16.50	
Health Services Fee	15.00
	<hr/>
	\$118.50
Dormitory Rent (double room)	\$195.00
Meal Tickets (2nd sem. \$354)	350.00
	<hr/>
Residents Total Fees	\$663.50
<i>Non-Residents:</i>	
All regular resident fees	\$663.50
Tuition	150.00
	<hr/>
Non-Residents Total Fees	\$813.50

All semester charges are payable each semester upon registration.

Students normally will pay approximately the sums above at semester registration time. However, those taking less than 7 semester credit hours pay no tuition and pay \$15.00 per credit hour in lieu of the University Fee, and are not eligible for dormitory occupancy.

Other expenses at registration time may require extra funds for less predictable amounts, including personal and social expenses, text books, meals needed before meal tickets become effective, bus fare, and athletic equipment, musical instruments and other specialized classroom supplies which certain students may need.

TUITION

Residents—Tuition is free to Alaska residents—persons 19 years or older who have established residence in the State for at least a year prior to the date set for registration for any semester. The legal residence of those under 19 years old is the residence of the parents or legal guardian. The residence of all military personnel is Washington, D.C., with the exception of those whose parents are legal residents of the State or those who were inducted into the Armed Forces through a State Induction Center while they were legal residents of the State. Children of military personnel who have been stationed in Alaska for more than one year are granted residence status. Students from the Yukon Territory may register on the same basis as Alaskan students.

Non-residents—Tuition shall be charged non-resident students carrying seven or more semester credit hours, at \$150.00 per semester.

University Fee—Students registering for seven or more semester credit hours shall be charged a fee of \$82.50 per semester. (No course fees or deposits shall be charged, except for individual instruction in music.) Residents and non-residents alike shall pay this fee.

Students registering for less than seven semester credit hours shall be charged a fee of \$15.00 per credit hour.

Fee rates apply to students auditing any course in the same manner as for those taking it for credit.

MISCELLANEOUS FEES

Application Fee—A fee of \$10 shall be paid at the time the application for admission is submitted.

Late Registration Penalty—Students registering later than the day designated for that purpose shall pay a late registration fine of \$5.00 for the first day, plus \$2.00 for each succeeding day allowed for late registration (excluding Saturday and Sunday).

Change of Registration—A penalty fee of \$1.00 shall be paid for each course added or dropped after the third day following the scheduled date for registration. Changes necessitated by University cancellation or rescheduling of classes are not subject to penalty.

Examination Fee—A minimum charge of \$3.00 shall be made for each examination required for removal of an incomplete, clearance of an entrance deficiency or credit by examination, plus an additional \$1.00 for each credit over three.

Late Placement and Guidance Test—A charge of \$5.00 shall be made for a placement and guidance test taken at a time other than the scheduled time.

Transcript Fees—One certified transcript is issued free. A charge of \$1.00 shall be made for each additional transcript.

Graduate Placement Fee—The University charges \$10.00 for filing of credentials and one year of service. Thereafter, \$5.00 is charged for each year the file is used. There is no filing fee for students who file before graduation.

Program Plan—The Registrar's Office will provide without charge one plan for a schedule of courses leading to a degree. A fee of \$5.00 will be charged for each subsequent alternate plan.

Music Course Fees—All music fees shall be waived for students enrolled for seven or more credit hours and taking a major or minor in Music or Music Education, as certified by the department chairman.

Mining Short Course Fee—A single fee of \$5.00 per non-credit unit shall be charged for registration in the mining short course.

CAMPUS ACTIVITY FEES

Undergraduate students carrying twelve (12) or more semester credit hours or the equivalent, under twenty-six (26) years of age, shall be charged the Campus Activity Fees totalling \$21.00 per semester.* Each student paying such fees receives an identification card entitling him to privileges in the following programs:

* (Other students may pay this fee voluntarily to receive all benefits except voting and holding student offices.)

Recreation — Athletics Program—This fee is assessed and collected by the University. The specific use of this fee and the responsibility for the recreation athletics program lies with the director of Health, Physical Education and Recreation.

Associated Students Program—The fee for student social activities and publications is set by the Associated Students of the University of Alaska, the duly recognized and established student government and is assessed and collected by the University. Student publications, social and student government activities and the budget for these activities are the responsibility of the elected and appointed student officials of the ASUA. These include activities such as social events, student self-government administration, yearbook and student paper.

A deposit of \$2.00 will be required once each year of all students paying the campus activity fee. This sum will be refunded at the time of taking the student's picture for the yearbook.

STUDENT HEALTH SERVICE FEE

Undergraduate students under twenty-six (26) years of age, carrying twelve (12) or more semester credit hours or equivalent shall be charged a Student Health Service Fee of \$15.00 per semester.** Such students, if in military service or military dependents, shall be exempt from payment of this fee upon presentation of satisfactory evidence that adjacent military hospital and medical facilities are available to them and will be utilized by them.

The student health program is administered by the Health Center under the direction of the Director of Student Affairs and the University Nurse. Hospital and medical treatment for common illnesses and injuries are provided, upon the authorization by the University Nurse, under limits of coverage set forth in the Student Health Plan. Each student will be supplied with a set of regulations outlining this plan.

Married students may secure additional coverage for spouse and children if desired. Rates for such coverage will be quoted at registration time.

DORMITORY AND DINING HALL CHARGES

Contracts for board and room are written for the period of registration to the end of the academic year.

Dormitory Deposits—A \$35.00 non-refundable dormitory application and reservation deposit is required with the student application blank. This is applied to the rent only in the semester for which the room reservation was made.

Dormitory Rent—

On Double Room: \$195.00 per semester

On Single Room: \$225.00 per semester

This rental covers all lounge, recreation room, storage room, laundry room and telephone privileges. Toll calls may not be made over floor phones in dormitories.

** (Other students, under 35 years of age, may pay this fee voluntarily.)

Meal Tickets—When registering, each dormitory occupant is required to buy a semester meal ticket for cafeteria meals. The rate is \$95.00 per full month:

First Semester Meal Ticket	\$350.00
Second Semester Meal Ticket	354.00

Meal tickets become effective at dinner, September 12 and dinner, January 23. Refunds are granted only with approval of the Director of Student Affairs upon formal withdrawal, for absence on University activities, or for extreme personal emergencies.

Semester meal tickets do not include vacation periods. Special meal tickets may be purchased before specified dates for:

Orientation Week	\$21.00
Thanksgiving Recess	16.00
Christmas Recess	51.00
Semester "Break"	11.00
Spring Recess	16.00

Those not possessing Special Meal Tickets may buy meals during vacation periods at ala carte prices.

PAYMENT OF FEES

All charges, deposits, rent and meals for the semester are payable in full on the second day following registration. Late settlement of fees is subject to a fine of \$2.00 for each day following the date on which they first become payable. An installment contract may be arranged under which a 25 per cent payment is due upon registration and additional installments are payable for up to three (3) months following the date of registration. The installment contract service fee is \$2.00 for the contract and \$2.00 for each additional payment. Delinquent payment of installments is subject to a \$2.00 fine for each occurrence.

Refundable Charges—Refunds of the University fee, tuition fee, music course fees and campus activities fee, shall be made to withdrawing students upon formal withdrawal by or for the student, according to the following schedule:

- Withdrawal within the first week—90 percent refund
- Withdrawal within the first 1/3 of term—50 percent refund
- Withdrawal after first 1/3 of term or semester—no refund
- Health service and miscellaneous fees shall not be subject to refund

Board—The unused portion of a meal ticket, less a service charge equal to five days' meals, shall be refunded upon formal withdrawal.

Rent—Room rent is refundable, upon recommendation of the Director of the Office of Student Affairs, only in emergency cases. The amount of refund shall be determined by application of a charge equivalent to 10% of the semester rent times the number of weeks of occupancy completed.

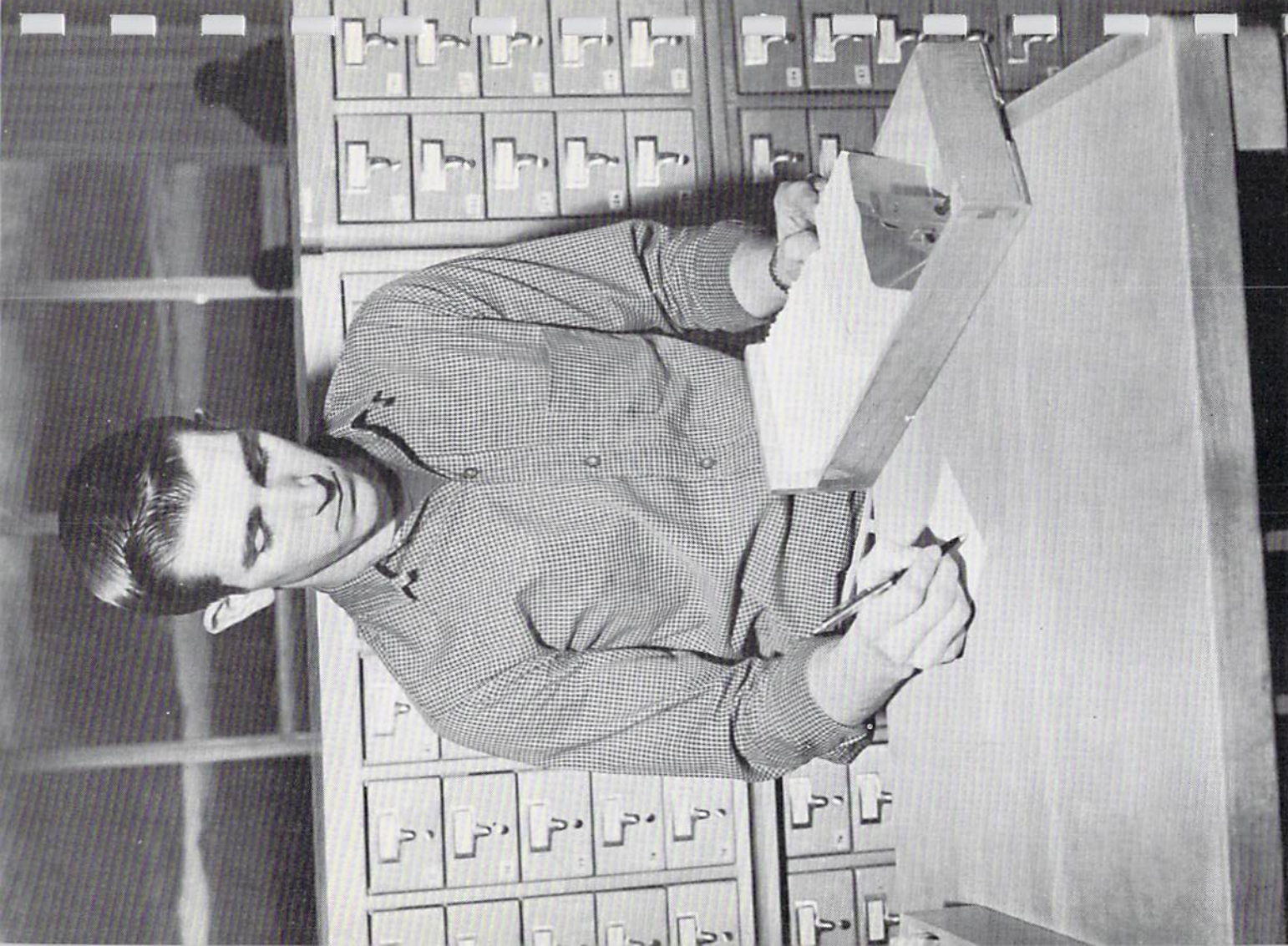
Financial Obligations—The University withholds delinquent students' diplomas pending their final payment of debts owed to the University. The Registrar also withholds grade reports and transcripts until debts to the University have been paid. No student owing the University money can receive honorable dismissal.

TRANSPORTATION TO THE UNIVERSITY

The Alaska Railroad gives qualified University students a round-trip ticket for the price of a one-way ticket. This applies to Summer Sessions and Home Economics Short Course students, as well as those attending regular sessions. The return ticket may be used only after completion of one semester's work or after full attendance at the Summer Sessions or Home Economics Short Course. The student must request the special rate when purchasing his first ticket. Upon arrival at the University, he should deposit the proper ticket receipts with the Registrar for safe-keeping and certification.



The performing arts, music, drama, writing, are an exciting and important part of campus life.



Study areas in the University Library overlook the Alaska Range and Mount McKinley.

Academic Regulations

Each student will be held responsible for the regulations of the University as they apply to him.

Orientation and Placement Testing—All entering undergraduate students are required to participate in the orientation program conducted just before fall and spring semester registration. The purpose of this program is to acquaint the new student with the history, the customs, and the campus of the University of Alaska, and to aid him in the planning of a profitable college career.

Many entering freshmen will have taken the examination of the American College Testing Program during their senior year in high school. Those entering freshmen for whom the University has received ACT scores will not be required (or permitted) to repeat the examination during Orientation Week. However, all new students who are entering the University with fewer than 30 hours of acceptable transfer credit and for whom the University has not received ACT scores will be required to take the test during orientation week and to pay a \$5.00 testing fee. The ACT and other placement and guidance tests must be taken before a new student with less than sophomore standing may complete his registration. On the basis of test scores, a student whose background of training appears to be deficient in areas such as English and mathematics may be required to take English A or Math A or both. In such cases, the student will be unable to complete the requirements of most curriculums in the minimum time.

An additional fee of \$5.00 will be charged to students who take the placement and guidance tests at other than the scheduled times during orientation week.

Although transfer students are required to participate in the orientation program, they are not required to take the placement and guidance tests if they have at least sophomore standing. However, for the assistance which test scores may give the transfer student and his advisers in planning his educational program, it is recommended that he take the placement and guidance tests at the time they are administered to entering freshmen.

Attendance—Regular attendance is expected in all classes. Unexcused absences may result in a student's being dropped from the course with a failing grade. It is the responsibility of the student to establish to the instructor's satisfaction the validity of an excuse for absence and to work out with the instructor acceptable arrangements for making up missed work.

Class Standing—Class standing is determined on the basis of total credits earned.

Students are classified as:

Freshmen	0-29 credits
Sophomore	30-59 credits
Junior	60-94 credits
Senior	95 credits

Transfer students will be given class standing on the basis of the number of credits accepted by the University. Special students are registered without class standing.

Study Load—Students normally may register for 18 semester hours of credit; for 19-20 semester hours with the approval of the dean of the college; for 21 or more semester hours provided the student's grade point average with a full time study load for the past two semesters is at least 2.75 and a petition to carry this maximum load is approved by the Council of Academic Deans.

For the purpose of computing study loads, non-credit courses are rated the same as credit courses.

No student who has failed in any work may register for more than the number of credits tabulated in his curriculum until he has carried that number successfully for one semester.

A full-time student is one who enrolls for 12 or more semester hours of credit. Any student who qualifies for entrance and registers for fewer than 12 will be classified as "part-time" regardless of his previous standing.

Any student registered in 12 or more credits must fulfill the requirements in military science or physical education.

Any student who does not follow a prescribed course of study or curriculum leading to a specific degree will be enrolled as "interim," whether he be a full-time or a part-time student.

All "special" students are considered to be "interim" without class standing.

Credit by Examination—An enrolled student is eligible to petition for permission to receive credit by examination if he can provide evidence of sufficient experience or previous study pertaining to the course in question. When permission is granted, the student is required to register immediately and pay the fees of the course which has been officially approved. A course in which a student has been registered as an auditor may not be completed for credit by examination.

Change of Curriculum—A student desiring to change his curriculum may do so only at the beginning of a semester, and must obtain the written consent of the heads of the departments concerned.

Change of Registration—A student is expected to complete the courses in which he is enrolled. He may, if circumstances warrant, withdraw without penalty during the first two weeks of the course; after that time a grade of "WP" is given only if he is doing passing work and a grade of "WF" is given if he is doing failing work. After the first month of the course, a student who wishes to withdraw must submit his request by petition, which shall include the reason for the request. Student initiated withdrawals are not permitted during the last month of the semester.

Elective and non-sequence courses should be dropped first; withdrawals from deficiency courses or English 101-102 may be made only upon petition. The fee for student initiated course changes is \$1.00 per course. A Change of Registration card must be obtained from the Registrar.

Grading System—Only letter grades appear on the student's record and transcript. Attention is called to the following analysis:

A—An honor grade; indicates originality and independent work, a thorough mastery of the subject, and the satisfactory completion of more work than is regularly required.

B—Indicates outstanding ability, and a performance definitely above the average.

C—Indicates a satisfactory and average response to assignments.

D—The lowest passing grade; indicates work of poor quality and does not entitle the student to the recommendation of the University.

P—Indicates passing work and carries no grade points.

F—Indicates failure.

S—Indicates satisfactory completion, is used only for graduate theses, and carries no grade points.

I—Given only in cases where additional work is necessary for the satisfactory completion of the course; not given unless the work already performed in Grade C or better; may be given for unavoidable absence.

The grade for work that is incomplete (I) becomes a failure (F) if the work is not completed by the end of the sixth week following the student's next registration. At the option of the instructor and head of the department offering the course, the removal of the incomplete may be postponed until the next semester in which the course is regularly given.

Def—Indicates that for good cause, as determined by the instructor, the grade in certain courses, such as thesis, may be withheld, without penalty, until the requirements of the course are met within an approved time.

WP—Given when a student makes a regular withdrawal from a course while doing passing work.

WF—Given when a student makes a regular withdrawal from a course while doing failing work. It indicates failure and is so computed in the grade point average.

Grade Points—For the computation of grade points, each credit is multiplied by a grade factor: Grade A by 4, grade B by 3, grade C by 2, grade D by 1, and grade F or WF by 0. The record and transcript of the student show all grades received, together with all rulings on special petitions or authorized substitutions. A grade point average of 2.00 is required for good scholastic standing.

Probation and Academic Disqualification—At the end of any semester of attendance a student failing to earn or maintain a grade point average of 2.00 may be placed on academic probation. Students who fail to raise their scholastic average after being placed on probation may be academically disqualified and not permitted to re-enroll at any units of the University for one or more semesters. A disqualified student will be readmitted only upon his presentation of evidence indicating a high probability that he can do satisfactory college level work. The most obvious

evidence is the completion of two or more college level courses with a grade of C or higher at another accredited institution or by correspondence.

Dismissal—A student may be dismissed for cause at any time by the President of the University.

Honor Rolls—Students who earn at least a 3.5 semester grade point average for no less than 12 credit hours are listed by the Academic Vice President on the University's Honor Roll.

Graduation—The responsibility for meeting all requirements for graduation rests upon the student.

Graduation with Honors—Students who obtain a grade point average of 3.5 will be graduated *cum laude*; 3.8 *magna cum laude*; and 4.0 *summa cum laude*, provided they meet the honors as well as the general residence requirements.

In order to graduate with honors, students transferring from institutions must have been in attendance at the University of Alaska for at least four semesters with a minimum of twelve credits each semester.

AWARDS

Listed below are awards which have been established for students who demonstrate outstanding achievement in various fields and activities. Information concerning awards may be obtained from the Office of Student Affairs, from the Department of Military Science, or from the Department of Health, Physical Education and Recreation.

American Institute of Mining and Metallurgical Engineers, Alaska Section
American Society of Civil Engineers, Fairbanks Sub-Section of the Alaska Section

Athletic Letters and Awards

Marion Frances Boswell Memorial Award

Chemistry Department Outstanding Freshman

Druska Carr Schaible Memorial Award

Fairbanks Garden Club Conservation Award

Fairbanks Weavers Guild

George M. McLaughlin Memorial

Archie W. Shields Prize

Sigma Xi Club, University of Alaska

General James Steese Prize

Joel Wiegert Award

R.O.T.C. Awards

Alaska Sons of American Revolution Award

Armed Forces Communications and Electronics Association Gold Medal Award

Association of the United States Army Medal

Best Basic Cadet Ribbon

Charles J. Keim Freshman Marksmanship Award

Dorman H. Baker Gold Medal Award

Gold Rifle, Marksmanship Award

Governor's ROTC Gold Medal

Honor Cadet Medal (Military Order of World Wars)

Legion of Valor

NRA Marksmanship Awards

Rifle Team Participation Ribbons

Tanana Valley Rifle and Pistol Club Marksmanship Award

United States Army Superior Cadet Ribbon

University President's Award Medal

Veterans of Foreign Wars Silver Medal

Office of Student Affairs

GENERAL RESPONSIBILITIES

The University provides services intended to assist students in making their educational careers more profitable and meaningful. While the principal function of the University is to foster the intellectual growth of the student, it is recognized that the social, moral, physical and spiritual development of the individual also are of prime importance. Mindful of its obligation to assist the total development of the student, the University continues to expand its student personnel facilities to meet the need for individualization in the educational process.

The Office of Student Affairs is responsible for coordinating and extending personnel services such as: a) orientation activities to help new students adjust to the privileges and responsibilities of membership in the University community; b) psychological testing to help students find out more about their academic and vocational potentialities and capabilities; c) counseling with students relative to their personal or educational problems; d) financial assistance for students through the administration of scholarships, loans and part-time jobs; e) medical attention for students with health problems; f) the assignment to, and the supervision of, student residence halls; g) the guidance of student co-curricular activities and organizations; and h) the promotion of high standards of student conduct.

COUNSELING AND TESTING

The Office provides professional counseling services and specialized testing services for all regularly enrolled students.

Educational Counseling—Each student who has declared a major is assigned a faculty adviser who assumes special responsibility for the student's welfare and helps him plan his academic program. The student who is uncertain of his choice of an academic major is assigned an interim adviser until a definite academic goal is chosen. Students who wish information or help with regard to the selection of a major academic field should avail themselves of the counseling and testing services offered by the University.

The Department of Counseling and Testing assists students who fail to meet the scholarship standards of the University, who need help to discover academic weaknesses, and who may need help in planning remedial programs.

Vocational Counseling—The counseling and testing staff assists students in self-appraisal of their unique interests and aptitudes and in their search for a vocational goal. Psychological and vocational interest tests are used as needed. A library of vocational information is maintained and each academic department has additional information pertinent to its field.

Personal Counseling—The student may meet with professionally trained and experienced counselors individually and in groups to discuss adjustment problems of a personal nature. All interviews are private and the discussions are kept confidential. The student may apply in person for these services. Student contacts with the counseling service are usually voluntary, although individuals may be referred to the office by faculty and other University personnel.

Testing—Some tests are required of all new students with less than sophomore standing. The required tests include the test battery prepared by the American College Testing Program, the English and Mathematics placement tests, the library skills test and the reading survey tests.

To assist students in self-appraisal, a number of other testing instruments are provided. Vocational interest inventories, scholastic aptitude tests, achievement tests, and personality inventories are available with interpretation given by members of the counseling staff.

In addition to the above services, special nationwide testing programs are administered by the Department of Counseling and Testing. Students who intend to proceed with advanced study and who are required to take the Graduate Record Examination, the Law Schools Admission Test, the Medical Schools Admission Test or similar tests may arrange for these tests in the Office of Student Affairs.

STUDENT HOUSING AND FOOD SERVICE

Because the physical environment of the student during his college years is an important part of his educational experience, the University takes pride in providing the student with carefully planned and supervised modern facilities which help promote maximum educational and social development.

Each *Residence Hall* is staffed with a Resident Counselor and several Student Advisers. These key people in the residential living environment help create and sustain productive and creative experiences through which students can realize a maximum amount of educational, social, and cultural values. The Resident Counselor is a full-time member of the University staff, responsible for the administration, programming, and counseling within a residence hall. All staff members have had considerable experience in group living and group activities. The Student Advisers are full-time students who are selected to work with the Resident Counselor in planning and administering an interesting and valuable social, governmental, and recreational program.

All student rooms are trim, light and of ample size. Each student has his own bed, desk, chair, mirror, and drawer and closet space; it is his responsibility to provide all other furnishings, including bedding, pillow, and towels. Sleeping bags may not be used in residence halls.

The residence halls have attractive social rooms and recreational facilities. Regular maid service is provided in common areas such as corridors, lounges, and bathrooms. The student is responsible for keeping his own room clean and orderly.

All women students must live on campus unless they are 21 years old, or married, or live at home. All single men who are less than 21 and who do not live at home must live in a University residence hall during their freshman year. Exceptions to these regulations may be approved for good reason by the Office of Student Affairs before the beginning of any semester. Men students of sophomore standing or higher may live in one of the halls if space permits. Full-time students will be given preference over part-time students in the assignment of hall accommodations. Upperclassmen are given preference over new students in the assignment

of single rooms. Room assignments in general are made on a first come first serve basis provided that application and deposit requirements are complete.

All residents are required to contract for their meals by the year at the University Commons. Breakfast, luncheon and dinner are served daily throughout the school year. Although meal service continues during the Thanksgiving, Christmas and spring recesses for the benefit of those students who remain on the campus at those times, the cost of meals during such periods is not included in the board contract.

In order to provide students with meals of high quality at minimum cost, it is essential that the staff be able to plan its food purchases and preparations for relatively constant numbers. Therefore, it is not possible to provide special diets or to give refunds for meals missed. If, for reasons such as illness, a student who has contracted for meals is unable to report for them for more than five consecutive days, a refund for the sixth and subsequent days may be recommended by the Office of Student Affairs. Refunds are also granted to students participating in authorized University functions where meals are not provided.

Harriet Hess Hall, constructed in 1938, provides single and double room accommodations for single faculty members, graduate students, and upperclassmen with approved G.P.A.'s. The residence is named for the late Harriet Hess, secretary of the Board of Regents for many years.

Andrew Nerland Hall houses 98 men in double and single rooms on its four floors. First occupied in 1953, Nerland Hall is named for a pioneer Fairbanks merchant, long-time member of the Board of Regents, and president of the Board from 1935 until his death in 1956.

John E. McIntosh Hall, completed in 1956, has double and single rooms for 98 men. This four-story building is named for a former president of the Board of Regents.

Wickersham Hall, completed in 1957, is a three-story residence for 99 women. It has 19 single rooms and 20 suites. Four women share each suite, which consists of two sleeping rooms, a study room, and a lavatory. It is named for the late Judge and Mrs. James Wickersham. Judge Wickersham introduced the bill into Congress that created the University of Alaska, and Mrs. Wickersham served on the Board of Regents.

Morton Stevens Hall, completed in the fall of 1958, is a four-story structure with accommodations for 102 men in double and single rooms. It is named for Morton Stevens, who was president of the Board of Regents from 1921 until 1932.

Austin E. Lathrop Hall houses 144 men in double and single rooms on its five floors. The building is named for a prominent Fairbanks businessman whose interests throughout Alaska were many and varied. Mr. Lathrop served as a member and later as vice-president of the Board of Regents during the period from 1932 until his death in 1950.

Ivar Skarland Hall, completed in the fall of 1964, provides double and single room accommodations for 138 women. The study-bedrooms are located around a central core area containing lounge, sewing rooms, ironing rooms, T.V. lounge, and shower facilities. The hall is named for Ivar Skarland, long time professor of Anthropology at the University.

The newest residence hall to the campus is an eight story building containing both single and double rooms. Capacity of the building is 322 students. Facilities in this hall are similar to those of its companion, Skarland Hall. These two units comprise to date a living center on the hill for men and women to the west of the President's residence overlooking the Tanana Valley.

Married student housing is provided in several areas. *Walsh Hall*, completed in 1959, has accommodations for couples with no more than one child. This spacious building contains 12 furnished apartments consisting of a living room-kitchen, bedroom, and bath. The building is named for the late Michael Walsh of Nome who was a long-time member of the Board of Regents.

Completed in the spring of 1964 is *Harwood Hall*, named for the late Boyd Harwood, former member of the Board of Regents, which houses an additional 38 married student couples or families. All apartments are furnished except for personal items such as dishes, utensils and bedding. Two two-bedroom apartments are available for families with two or three children. One-bedroom apartments similar to those at Walsh Hall are assigned to couples without children, or with not more than one child. Still other quarters, without a separate bedroom, are assigned to couples without children.

Application Procedures—Applications for student housing will be mailed to all students with their notification of acceptance from the Registrar's office. Student rooms can not be reserved until the student is accepted by the University, through notification from the Registrar's office. Continuing students may reserve rooms during the Spring semester for the Fall semester or during the Fall semester for the next Spring semester providing that they have not been disqualified for scholastic or disciplinary reasons by the University. After being accepted and in order to secure student housing, the student should complete the Housing-Board contract and mail it immediately to the DIRECTOR OF HOUSING, UNIVERSITY OF ALASKA, COLLEGE, ALASKA, with a \$35.00 room advance. Confirmation for student housing is not assured until the student receives his copy of the contract with a receipt for his advance. Specific room assignments will be available after August 1st. Spring semester assignments are made as space becomes available. The contract for single student housing in undergraduate residence halls is for room and board. The contract for married student housing does not include board.

This advance is non-refundable. Unless written notification of late arrival is received by the Housing Director from a student for whom space is reserved not later than the first day of classes in any semester, the reservation will be cancelled and the space assigned to a waiting list applicant. Students are required to sign the Housing-Board contract from the time he enters the halls to the end of the spring semester, subject to terms indicated thereon. Students are expected to pay for the entire semester during registration; however, installment payments may be arranged.

Rent for double room approximates \$195.00 per semester and for a single room \$225.00 per semester. This rental covers all lounge, recreation room, storage room, laundry room and local telephone privileges.

Meal Tickets—Each occupant of undergraduate residence hall is required to buy a meal ticket for cafeteria meals. Meal tickets do not include vacation periods which occur during the semester. Full payment for a semester's meal ticket is required at registration time. The first meal covered by meal tickets is the first day of upperclass registration.

The **University Commons**, completed during the summer of 1963, provides beautiful and functional dining, food preparation, and lounge facilities for all students living in residence halls. Although most meals are served cafeteria style, table service for as many as 570 students is provided on special occasions.

All members of the undergraduate residence halls are required to contract for their meals both semesters at the University Commons. Breakfast, luncheon, and dinner are served daily throughout the school year. Although meal service continues during the Thanksgiving, Christmas and spring recesses for the benefit of those students who remain on the campus at those times, the cost of meals during such periods is not included in the board contract.

In order to provide students with meals of high quality at minimum cost, it is essential that the staff be able to plan its food purchases and preparations for relatively constant numbers. Therefore, it is not possible to provide special diets or to give refunds for meals missed. If, for reasons such as illness, a student who has contracted for meals is unable to report for them for more than five consecutive days, a refund for the sixth and subsequent days may be recommended by the Office of Student Affairs. Refunds are also granted to students participating in authorized University functions where meals are not provided.

STUDENT HEALTH SERVICE

Preventive and educational as well as protective health services are the concern of the University and are administered by the Student Health Service. Supervision and limited out-patient treatment during the day are the responsibility of the Registered Nurse at the Health Service. Physicians are available on campus two hours daily Monday through Friday for more extensive treatment. However, the Health Service does not attempt to provide complete medical care nor does it operate as an emergency medical center, although personnel are advised to keep the center informed.

In addition, the Nurse reviews mandatory health examinations for new students, keeps records up to date on all students, does follow-up on medical conditions as needed, provides out-patient service during the day and advice for emergencies at night.

Full-time students receive special rates for mandatory health insurance which provides hospital, medical and surgical benefits. The coverage is extensive, inexpensive and compulsory for all students carrying 12 or more hours and under 26 years of age. For all others it is optional up to the age of 35. It is designed to supplement, but not to replace Health Service care. Brochures containing details of the policy are available at the Health Service.

FINANCIAL AIDS

Three types of financial aid are available at the University of Alaska:

- 1) Grants (Scholarships)
- 2) Loan funds
- 3) Part-time student employment

1) Grants (Scholarships). At the present time grants are awarded only to Alaska high school seniors and to currently-enrolled University of Alaska students. Non-residents must successfully complete at least one semester of academic work at the University of Alaska before they become eligible to apply for scholarship assistance. Students who are enrolled at any of the University's Community Colleges and who plan to continue their study on the main campus at College during a forth-coming semester are invited to apply.

Applications from currently-enrolled students are accepted twice each year before March 1 and November 1. Applications from Alaska high school seniors are accepted once each year before March 1 and are reviewed only after the applicant's admission to the University has been approved and after his American College Test scores have been forwarded to the Office of Student Affairs. Requests coming in after these deadlines will not be considered. No grants are available for the summer session.

These awards are based primarily on need. The amount of the grant is based upon information supplied on the College Scholarship Service Parents' Confidential Statement form. Entering students seeking financial assistance are required to submit a copy of the Parents' Confidential Statement (PCS) form to the College Scholarship Service, designating the University of Alaska as one of the recipients by March 1 or November 1. The PCS form may be obtained from the University, secondary schools or the College Scholarship Service, P.O. Box 176, Princeton, New Jersey 08540 or P.O. Box 1025, Berkeley, California 94704.

Although need is the primary basis upon which these grants are given, demonstration of academic competence, personal characteristics, and contributions to the University community are evaluated.

Recipients at the University of Alaska forfeit entire grants which are to become effective in a forthcoming semester if they earn below a 2.0 grade point average in the current semester. Grants are automatically forfeited by recipients who do not enroll during a semester in which it is in effect, who enroll for less than a full-time program of studies without

special arrangement with the scholarship program coordinator, who are placed on disciplinary probation or who are suspended from the University for disciplinary reasons.

Questions concerning application forms, specific grants, or selection procedures should be directed to the Office of Student Affairs.

Although numerous grants are awarded annually to students at the University of Alaska by various individuals and organizations, the list below includes only those which were administered by the University's Financial Aid Committee during the 1965-66 school year:

<i>Name of Scholarship</i>	<i>Number</i>	<i>Total Amount</i>
AAUW "Kathryn Patty Memorial"	One	\$ 250
AIME, Southwestern Alaska Section	One	400
Alaska Insurance Agency "Major George W. Albrecht Memorial"	One	100
Alaska National Guard Officers Association	One	500
Alaska Native Scholarships	Twenty-three	12,330
Alaska Scottish Rite of Freemasonry	One	300
Alaska State Employees Association "President John F. Kennedy Memorial"	One	250
B and C Auto Electric	One	500
BMEWS Site #2, Communications Section	One	200
Covenant High School Alumni Association "Stanton Oyoumick Memorial"	One	50
Fairbanks Community Music Scholarship	Two	250
Fairbanks Kiwanis Club "Andy Anderson Memorial"	One	500
Fairbanks Kiwanis Club "Foreign Student Scholarship"	One	500
First National Bank of Fairbanks	Two	1000
General Electric "College Board"	Three	500
General Motors	Four	4150
Henderson Estate, John B.	Four	1600
Hess Estate, Harriet	Two	880
Hess Estate, Luther	Three	1200
Hoffer Glass Company	One	125
Music Shop of Fairbanks "Grace Hoitt Scholarship in Music"	One private music lesson per week	
International Brotherhood of Electrical Workers Local #1533 Building Corporation	Three	1200
Kennecott Copper Corporation	Two	1000
Ketchikan Pulp Company	One	500
Lathrop Estate, Austin E.	Nineteen	5700
Leach Estate, Frank M.	Two	250
Lewis Fund, Charles W. and Hortense W.	Two	250
McIntosh Estate, Jessie O'Bryan	Forty-four	15,025
Mikami Memorial, George and Mine	One	300
Mortar Board Alumnae of Seattle	One	300
National Bank of Alaska	Five	1000
National Electrical Contractors Association	One	500
Noel Wien Scholarship	One	250
Northern Commercial Company	One	500

Phipps, Margaret R.	Three	450
Pioneers of Alaska Memorial, Igloo #4	One	300
Presser Foundation	One	400
Radio Corporation of America	Two	800
Ralston Purina Company	One	500
Romick, Alaska, Inc.		
Sears Roebuck Foundation	Four	1200
Sears Roebuck Foundation (Home Economics)	One	300
Sheppard Trading Company	One	500
State Room Scholarships	Thirty-eight	11,792
Texaco, Inc.	Four	2000
Unalakleet PTA "Senator William E. Beltz Memorial"	One	50
United States Smelting, Refining and Mining Company	One	250
University of Alaska Alumni Association	One	300

2) Student Loan Fund. There are three different types of loan programs:

Emergency loans are available to all regularly enrolled full-time students whose financial need is modest and temporary. Although emergency loans require no co-signer, they are limited to \$100 for not more than 30 days and interest is in the form of a flat service charge of \$2.00 per loan or 50c if repayment is made within 10 days of the date of borrowing.

The *University Loan Fund* is available to regularly enrolled students who have successfully completed one semester as a full-time student. Loans are limited to \$500 and are payable prior to the forthcoming September 1. The interest rate on the money borrowed from the University loan fund is 4% per annum. The loan requires a co-signer (not a faculty member or fellow student), and will be made for University expenses only such as room, board, fees, and books.

The University Loan Fund represents the pooled resources of several separate loan funds given to the University over a period of many years:

Anchorage Women's Club (1926)	Sheils-Timson (1936)
American Military Engineer	Leopold F. Schmidt (1938)
Revolving Loan Fund	Palmer Associated Students (1941)
Lawrence C. Phipps (1930)	Frank Slaven (1944)
Fairbanks High School Alumni	Mr. & Mrs. Walter G. Culver
(1932)	(1959)
First National Bank (1945)	Verne E. Roberts Memorial (1960)
Phi Tau Gamma (1953)	James Stanley Rodebaugh
Palmer Community (1953)	Memorial (1960)
Glenn Carrington (1953)	James E. Nankervis Memorial
Larry Doheny (1953)	(1961)
Pioneer Women of Alaska (1954)	Herman Turner Memorial (1961)
Women's Auxiliary #4, Pioneers of	Rotary Club of Fairbanks (1963)
Alaska (1957)	Southern California Alumni (1963)
Dave M. Dishaw (1958)	Arthur A. and Anne Shonbeck
Anchorage High School (1958)	Memorial (1964)
Anchorage High School PTA	Marianne Casson Memorial Fund
(1959)	(1965)

The National Defense Education Act loans are available to a limited number of qualified students. Undergraduate students may borrow up to \$1,000 a year or \$500 maximum per semester, graduate students \$1500 per year. Total funds available to a student for his undergraduate work are limited to \$5,000. These loans are repayable nine months after a student discontinues or completes his education or finishes his military obligation or service with the Peace Corps. For those who become teachers, one-tenth of the amount borrowed is canceled each year for five years, representing as much as 50% of the original loan. Interest rate is 3% per annum. Loans must be paid within ten years.

The Seward Business and Professional Women's Club has a \$500 loan fund on deposit with the University of Alaska for the use of Seward High School graduates who have completed satisfactorily at least one semester's work at the University of Alaska.

The Clarence J. Rhode Memorial Scholarship Loan Fund was initiated by the Territorial Sportsmen, Inc. of Juneau. Junior, senior and graduate students in Wildlife Management are eligible for loans up to \$300.00, under terms similar to those of the Student Loan Fund. The head of the Department of Wildlife Management administers these funds.

Mr. Ralph R. Stefano, Consulting Engineer of Fairbanks, has established *The Stefano Loan Fund* for the purpose of furthering instruction in Mechanical Engineering. Loans may be made from this money to deserving students in Mechanical Engineering. The Dean of the College of Mathematics, Physical Sciences and Engineering administers these student loans.

3) Part-time Employment. Two types of work opportunities are available:

a) Listings are available in the Office of Student Affairs for both on-campus and off-campus jobs. Students interested may apply at the office for information but must apply for the position themselves. The University does not contract work for students although it may make recommendations to employers.

b) The University actively participates in the Work-Study program of the Economic Opportunities Act. This program is designed to provide work opportunities for students with acute financial problems. The University determines student eligibility for this program on the basis of family income. Under this program students may work up to fifteen hours a week during the school term and forty hours per week in the summer. Most of the work opportunities are on-campus and can be related to a student's professional or vocational interest. A student may inquire about this program at the Office of Student Affairs, Room 18, Bunnell Building.

In most cases financial aids are combined so that a student's financial need may be met from several sources: for example, $\frac{1}{3}$ from a grant or scholarship, $\frac{1}{3}$ from loans or savings, and $\frac{1}{3}$ from work.

The Society of American Military Engineers Revolving Loan Fund enables students in Engineering, Science and Mathematics to borrow money to continue their education under terms similar to those of the University Loan Fund. Application is made through the Office of Student Affairs.

CO-CURRICULAR ACTIVITIES

All students are encouraged to participate in at least some of a wide range of co-curricular activities. Many of them, such as the student government, the choral groups, band, dramatics, student newspaper, year-book, radio station, and intercollegiate and intramural athletics are open to academically qualified students regardless of their field of study. Others are activities or organizations in which participation is dependent upon enrollment in a particular curriculum. All may make meaningful contributions to the student's educational experience.

To encourage students to maintain proper balance between their curricular and co-curricular activities, and to protect the best interests of the University, the following code which determines eligibility for participation in all co-curricular activities and organizations has been adopted:

1. All members of University organizations must be students who are enrolled for twelve or more semester hours of credit.
2. Students who participate in co-curricular activities must maintain a cumulative grade point average of 2.00 or higher and must not be on disciplinary probation.
3. Additional eligibility requirements for members and officers in University organizations and co-curricular departmental activities may be established by the organization or department. Copies of these regulations shall be kept on file with the Office of Student Activities. The responsibility for enforcing eligibility regulations shall rest with the organization or department.
4. The Academic Vice President and the Director of Student Affairs shall review special cases or unusual circumstances regarding eligibility regulations and, with the approval of the President of the University, may make exceptions to the above rules.

Student Union Building—Dining, recreational, and co-curricular facilities are contained in *Constitution Hall*, the official name of the Student Union Building, which was completed in 1955. It was the site of the convention of Territorial delegates which drafted the Constitution for the State of Alaska. This modern, well-equipped building provides facilities for a variety of student services and activities. On the ground and main floors are a book store, game room, barber shop, coat room, and a lounge with television. The Snack Bar, which serves all members of the University community, occupies the entire second floor of Constitution Hall. Located on the third floor are offices of the student government, the student publications, the director of student activities, the speech, radio and drama facilities, and the alumni and graduate placement office.

STUDENT BEHAVIOR STANDARDS

Education at the University is conceived as training for citizenship as well as for personal self improvement and development. When a student enrolls he acquires a special status and prestige and assumes com-

mensurate responsibility as a citizen in the University community. As long as he remains a student, he represents the University—whether on or off the campus.

It is the University's policy to provide its students as much freedom of individual expression and action as is consistent with their maximum growth and with the welfare of the University. Students are expected, individually and collectively, to maintain this freedom by the exercise of that self-discipline which is imposed by a sense of social responsibility. Most students find it relatively easy to adjust to the privileges and responsibilities of the University citizenship. For those who find this process more difficult, the University attempts to provide such counsel as the student needs to gain insight and confidence in adjusting to his new environment. In some cases, when a student is unable or unwilling to assume his social responsibilities as a citizen in the University community, the institution may terminate his enrollment.

In order that new students become fully informed on the University's expectations, specific rules and regulations will be announced during the orientation sessions preceding registration for each semester. Printed copies of these rules and regulations are available for the guidance of students in the Office of Student Affairs. To those who live in University residence halls, manuals containing housing regulations will be distributed at the time rooms are occupied.

University regulations are designed to help the student work efficiently in his courses and develop a high standard of character and citizenship. They are not designed to ignore individuality, but rather encourage students to formulate rules for their own guidance and develop methods of enforcing the rules.

ALUMNI SERVICES

The University of Alaska Alumni Association promotes interest in the University and acquaintanceship among former students of the University to encourage continuing education among alumni; to advance the scholastic standing and the physical plant of the institution; and to preserve its history and traditions. There are branch chapters in Juneau, Seward, Anchorage, Fairbanks, the Matanuska Valley, California and Washington. The Association has an office on campus to which all correspondence should be addressed: Executive Secretary, University of Alaska Alumni Association, College, Alaska.

Former students who have taken credit courses at the University of Alaska, including any of its Community Colleges or other Centers, are eligible to belong to the Association. The Association publishes the "Alaska Alumnus" quarterly.

Graduate Placement Service is a division of the Office of Alumni Services. The essential aims of the office are to bring together in the most efficient manner employers and qualified applicants and to give the student encouragement and guidance in job selection and analysis.

All graduates of the University are eligible for graduate placement services. Seniors and graduate students who expect to complete work for degrees during the academic year are urged to visit the Placement Service and obtain registration forms at least one semester prior to graduation.

Refer to Graduate Placement Fee for cost of placement services.



Student residents of Ivar Skarland Hall practice before starting an annual evening of Caroling during Christmas week.

Admissions

REQUIREMENTS FOR ADMISSION

Admission as a Freshman

1. High School Graduates—Baccalaureate Programs

Residents—An Alaskan high school graduate with an academic average of "C", or higher, is eligible for admission. An Alaskan whose high school grades averaged less than "C" will be considered for admission to the University only if his performance on a qualifying test demonstrates that he has the capacity to undertake successfully college academic work. The test required in such cases is prepared by the American College Testing Program. The ACT test is administered at testing centers throughout the country in November, February, April and June of each year. Most Alaska high schools serve as ACT testing centers in November and/or February. Arrangements for taking the ACT test may be made through each high school's principal or guidance officer. The cost of the test to the student is \$4.00.

Non-Residents—A non-resident high school graduate with an academic average of "B", or higher, is eligible for admission. A non-resident whose high school grades averaged less than "B" will be considered for admission to the University only if his performance on a qualifying test demonstrates that he has the capacity to undertake successfully college academic work. The test required in such cases is prepared by the American College Testing Program. Information concerning ACT testing centers and dates may be obtained from most high schools throughout the nation and from the American College Testing Program, Post Office Box 168, Iowa City, Iowa.

High School Subject Requirements

A high school graduate offering the following pattern of studies will have no deficiencies in any program that he enters.

<i>Subject</i>	<i>Units</i>
English	3
Mathematics:	
Algebra	2
Geometry	1
Trigonometry	$\frac{1}{2}$
One Foreign Language	2
United States History	1
Physics or Chemistry	1
Natural or Social Science	1
Elective	4
TOTAL	15 $\frac{1}{2}$

The specific entrance requirements for a high school graduate of the six colleges of the University are given below:

<i>College</i>	<i>English</i>	<i>Mathematics</i>	<i>**Foreign Language</i>	<i>U.S. History</i>	<i>Natural or Social Science</i>	<i>Academic and Elective</i>
College of Arts and Letters	3	Algebra—1 Geom.—1	2	1	2	5
College of Behavioral Sciences and Education: Anthropology, and Geography, Psychology and Sociology	3	2	2	1	2	5
Education and Home Economics	3	*2	0	1	2	7
College of Biological Sciences and Renewable Resources	3	†Algebra—2 Geom.—1 Trigonom.—½	‡	1	Physics or Chemistry—1 Biology or Elective—1	7
College of Business, Economics and Government: Business Administration	3	2	‡	1	2	7
Economics, History & Political Science	3	2	2	1	2	5
College of Earth Sciences and Mineral Industry	3	Algebra—2 Geom.—1 Trigonom.—½	0	1	Physics or Chemistry—1	7½
College of Mathematics, Physical Sciences and Engineering	3	Algebra—2 Geom.—1 Trigonom.—½	0	1	Physics or Chemistry—1	7½

* Plane Geometry required of Education students who intend to select teaching majors and/or minors in mathematics, chemistry, and/or physics.

** Students who offer 2 units of a high school foreign language will enroll in second year language, and no credit will be allowed for first-year college courses in the same language.

† 1 year of algebra and 1 year of geometry will be acceptable for students in Agriculture and Biological Sciences not wishing to continue with advanced studies, such as graduate work, medicine, etc.

‡ Two years of French, German, or Russian language highly recommended. See departmental curricula.

Entering freshmen whose background of training in English and mathematics appears to be deficient when measured by placements tests may be required to take English I or Math A or both. Achievement of a certain level of excellence in these subjects is essential to success in other areas of study. These basic English and mathematics courses are especially designed to assist the student in achieving these competencies.

Courses completed at the junior high school level and certified on the official high school transcript by secondary school officials as being equivalent to courses normally offered at the high school level will be accepted as meeting college entrance requirements.

When a student is deficient in specific subjects, but offers a satisfactory general record, he may enter with an entrance deficiency. The student must remove deficiencies during the freshman year. All courses taken to remove deficiencies must satisfy the department head concerned, and must be in the subject in which the student is deficient.

2. Non-High School Graduates—Baccalaureate Programs

Mature students, at least 21 years of age, residing in Alaska, who have not graduated from high school, or been awarded a high school diploma on the basis of GED military tests, or have not completed any previous college level work, may be admitted. Such students may be converted to "regular" student status and become baccalaureate degree candidates after completion of not less than 30 collegiate semester hours of credit with at least a "C" average (2.00).

3. High School Graduates—Associate Programs

Any high school graduate is eligible for admission to all associate degree programs except electronics technology (see page 103).

Admission of a Transfer Student

Transfer students from other accredited institutions are considered for admission provided they have a 2.00 grade point average and honorable dismissal. The University will transfer credits from other accredited institutions when the grades of courses completed are "C" or above. Transfer credits are evaluated and equated by the Registrar and approved by the department head after a student is admitted to the University. The University reserves the right to reject work of doubtful quality or to require an examination before credit is allowed.

Transfer students with less than thirty acceptable credits are required to take the tests prepared by the American College Testing Program. Information concerning ACT testing centers and dates may be obtained from most high schools throughout the nation and from the American College Testing Program, Post Office Box 168, Iowa City, Iowa.

Members of the Armed Forces who have taken USAFI courses may, upon presentation of credentials to the University's Head of Evening Classes and Correspondence Study, receive credits as recommended in the Evaluation of Educational Experiences of the Armed Forces. College credit will not be allowed for the General Educational Development Tests.

Credit for military service may be substituted for the ROTC and/or physical education requirements.

Admission of Post Graduate and Graduate Students

Post Graduate—Students who hold a bachelor's degree but who have not defined their graduate program or declared the subject in which they wish to pursue their studies toward a higher degree may be admitted as "Post Graduates." Registering as a post graduate is satisfactory for those who hold a bachelor's degree and who have the following or similar purposes:

1. Students who plan to take "interest" courses.
2. Students completing work for a teaching certificate.
3. Students completing a second undergraduate major and/or a second bachelor's degree.
4. Students strengthening their preparation in order to be admitted to graduate study.
5. Transient students expecting to be at the University only briefly.
6. Students awaiting action on applications for graduate status.

Graduate—See page 51.

Admission of Others

Special Students—Mature students, at least 21 years of age, who have graduated from high school and/or attended college previously may be admitted without filing transcripts of high school or college work completed. Such students are limited to enrollment in two classes unless special permission is obtained. Special students are subject to the academic regulations of the University, but are not considered degree candidates until regular admission requirements are met and transcripts filed.

Auditors—Auditors are students who enroll for informational instruction only. They do not receive academic credit, have laboratory privileges or submit papers for correction and grading. They must apply for admission, register formally on the designated registration dates, obtain approval of class instructors and pay the required fees.

A course in which a student registered as an auditor may not be completed for credit by examination at a later date.

High School Students—To facilitate the transition and adjustment from high school to college the University has made special provisions for students of varied background and ability. Qualified Alaskan high school seniors of advanced academic standing and ability are permitted to enroll, while attending high school, in certain University of Alaska classes taught by University faculty and to enroll in college courses which may be offered at authorized high schools. To qualify for admission to college classes while still attending high school, a high school senior must have the recommendation of his high school principal, the approval of his parents, and a satisfactory score on the usual testing program required for entering students. Credits earned in such college classes may not be applied to high school graduation, but will apply toward graduation from the University and may be transferred to other universities following graduation from high school, provided the grades earned are satisfactory. Seniors who are interested in participating in this program should contact their high school principal.

After enrollment at the University, a student may receive credit in CEEB Advanced Placement Tests, or the equivalent, when test scores warrant it and may receive course credit by examination upon presentation of adequate justification.

APPLYING FOR ADMISSION

When to Apply

Seniors in high school should make application for admission during the last semester of their senior year, if they plan to enroll at the University during the next fall semester. Transfer students should apply after the completion of a semester or school year, so that a complete transcript can be sent. Graduate students should make application during their senior year of college. Applications for admission should be presented no later than August first for the fall semester and December 15th for the spring semester. Applications received after these closing dates may be considered for the following semester.

How to Apply—Read Carefully.

Application forms may be obtained from the Office of the Director of Admissions and Registrar. Applications for admission will be considered only when the following credentials have been received by the Office of the Director of Admissions and Registrar:

1. *Application for Admission.* The \$10 application fee must accompany the completed application for admission form.
2. *Scholastic records.* A secondary school record form completed by the high school where the applicant finished his high school work should be mailed by the high school. Applicants are required to submit complete official transcripts of all high school and college credits. If the work has been taken at two or more collegiate institutions, an original transcript from each college attended is required. These transcripts should be sent directly from the registrar of the college where the work was taken to the Director of Admissions and Registrar at the University of Alaska. The applicant is responsible for securing these scholastic records. An application for admission is not processed until all such records are on file. Any person who willfully refrains from transferring all of his scholastic records or giving full information concerning previous attendance at other institutions will not knowingly be accepted or retained as a student.
3. *Letters of recommendation* (graduate applicants only).

After receiving and processing the above materials, the Registrar's office will mail to the student a statement of acceptance or non-acceptance. After the acceptance statement is received, the following items, where applicable, should be completed and mailed to the proper offices within the time limits suggested.

1. *College catalogs* (transfer students only). Transfer students are responsible for having catalogs of colleges previously attended sent to the Director of Admissions and Registrar at least two months prior to the expected date of enrollment.
2. *Medical and Physical Examination.* Registration at the University is dependent upon the applicant's having completed a recent physical examination which will confirm that his health is sufficient to enable him to undertake successfully the course of study for which he is applying. This requirement applies to all new students enrolling in 7 credits or more, any students enrolling in 7 or more hours for the first time, and to former students returning to the University after an absence of two or more semesters enrolling in 7 or more credits. The physical examination is to be completed by the physician of the applicant's choice, and recorded on the University physical examination form, no earlier than five months before registration and no later than two weeks be-

fore registration. Evidence of smallpox vaccination within three years and results of a Tuberculin Test within the year (also of chest x-ray within the year if the test is positive) must be included. These must all be received by the University Nurse before registration may be completed.

3. *Residence Hall-Board contract and deposit.* All accepted single students will receive a residence hall-board contract with their acceptance notice from the Registrar's Office. In order to secure a room in the residence hall, this form should be completed immediately and mailed to the Director of Housing, University of Alaska, with a \$35.00 room deposit. For additional information on single student housing and/or married student housing, see the appropriate sections in this catalog.
4. *ACT results.* Entering freshmen and transfer students with less than 30 semester hours of transferrable credit who have taken the American College Testing Program should have their test results sent to the University prior to registration. If the University of Alaska was not indicated as an institution to receive the results when the candidate took the test, he should write to the American College Testing Program and have the results forwarded to the University. The request should be addressed to the American College Testing Program, Box 168, Iowa City, Iowa.

Conditional and Final Acceptance

Qualified applicants can be accepted for admission while currently enrolled in their last semester of high school or at another college. However, the acceptance is conditional upon receipt of an official transcript indicating the satisfactory completion of the work in progress at the time of acceptance and in the case of high school seniors and graduate applicants, the completion of graduation requirements.

Final acceptance to the University for the purpose of earning scholastic credit becomes complete only when all credentials have been received and accepted.

Degrees

DEGREES OFFERED

The University offers programs leading to the following:

Undergraduate Degrees

Associate of Arts, A.A.
Associate of Business Administration, A.B.A.
Associate of Engineering, A.E.
Associate of Science, A.S.
Bachelor of Arts, B.A.
Bachelor of Business Administration, B.B.A.
Bachelor of Education, B.Ed.
Bachelor of Engineering, B.E. (5 years)
Bachelor of Science, B.S.

Professional Degrees

Engineer of Mines, E.M.

Graduate Degrees

Master of Arts, M.A.
Master of Education, M.Ed.
Master of Fine Arts, M.F.A.
Master of Science, M.S.
Doctor of Philosophy, Ph.D.

GENERAL REQUIREMENTS FOR UNDERGRADUATE DEGREES

To receive a degree from the University, a student must have earned the required number of credits as well as satisfied the special requirements of his curriculum. He must attain an average grade of 2.00 (C) in all work, as well as in the major field and minor fields; transfer students must maintain a 2.00 (C) average in all work at the University of Alaska.

BACHELOR'S DEGREES

All regularly enrolled, physically fit male students without military training who are citizens of the United States, under 24 years, must complete the Basic Course, R.O.T.C. (See under Military Science).

All physically qualified women students under 24 years and all physically qualified men students under 24 years who are exempt from military training, entering the University for the first time, must enroll in physical education. Such students must complete two years of physical education, preferable during the first two years of attendance at the University.

Transfer students must meet the requirements of the University with respect to military science or physical education, unless they have completed the requirements of the schools previously attended.

Students must earn in residence at the University of Alaska at least 24 credits in upper division courses and at least 30 of the last 36 credits for the degree.

An upper division student showing a marked English deficiency may have to pass a remedial course in English.

A maximum of 32 semester hours of work completed by correspondence may be accepted toward a degree.

A student enrolled in a bachelor's degree program may elect to graduate under the requirements of the general catalog in effect during the year of graduation or in effect at the time he originally enrolled, providing there has not been a time elapse of more than seven years.

GENERAL REQUIREMENTS FOR A B.A. DEGREE

English Composition and Literature, including Engl. 101-2	12 credits
Foreign Language—Two years of collegiate work in one language.	12-16 ^a
Students offering 2 units of one language from a secondary school will enter the second year or begin a new language. 12 credits fulfill the requirement if all are above the 100 level.	
Social Science, including Hist. 117-8 and work in two other fields	15
Mathematics and/or Natural Science, Math. 106-200 or Math. 121-122 or a year sequence in a laboratory science plus enough credits to total 12.	
Major Specialty—(See Departmental Sections for specific requirements)	23-26
If the major specialty is a natural or social science, electives in English or foreign languages may be substituted for the general degree requirements, if the program includes a major and at least one minor in these areas.	
Minor Specialties—2 of 12-18 credits each, or a second major to be approved by petition.	23-24
Physical Education or Military Science	4-6
Electives—To bring total credit to 130 credits.	

MAJOR SPECIALTIES AVAILABLE FOR B.A. DEGREE—Anthropology, Art, Biological Sciences, Botany, Chemistry, Economics, English, French, Geography, Geology, German, History, Linguistics, Mathematics, Music, Physics, Philosophy, Political Science, Psychology, Russian, Spanish, Speech, Sociology, Zoology.

MINOR SPECIALTIES AVAILABLE FOR B.A. DEGREE—Anthropology, Art, Biological Sciences, Botany, Chemistry, Economics, Secondary Education, English, French, Geography, Geology, German, Home Economics, History, Journalism, Linguistics, Mathematics, Military Science, Music, Philosophy, Physics, Political Science, Psychology, Russian, Sociology, Spanish, Speech, Zoology.

GENERAL REQUIREMENTS FOR A B.B.A. DEGREE

English Composition and Literature, including Engl. 101-2, 213, 328 or 336 and 3 credits in another Literature Course.	15 credits
Behavioral Science—All in Psychology or All in Sociology/Anthropology	9
History and Political Science, including Hist. 131-2, P.S. 101-2	15
Economics, including Econ. 121-2, 232, 321, 324, 350, 429	21
Mathematics, including Math. 121, 122, and 204	14
Biological Science 105-106 or Chemistry 101-102 or Physics 103-104	8
Military Science/PE	4-6
General Requirements, including:	
Acc. 215-216—Principles of Accounting	6
B.A. 331-332—Business Law	6
Major Specialty (See Departmental Sections for Specific Requirements)	12-18
Approved Electives (8-20 credits) to total 130 credits.	

GENERAL REQUIREMENTS FOR A B.Ed. DEGREE

For requirements for a B.Ed. in Elementary Education, see page 78.
For requirements for a B.Ed. in Secondary Education, see page 79.

GENERAL REQUIREMENTS FOR A B.S. DEGREE (ENGINEERING SCIENCE)

English Composition and Literature, including Engl. 101, 102, 313	12 credits
Social Science, including Econ. 121	9
Engineering Science, including E.S. 101, 102, 111, 112, 207, 208, 331, 341, 346	27
Mathematics, including Math. 106, 200, 202, 302, 312	23
Chemistry, including Chem. 201, 202	8
Physics, including Phys. 211, 212	8
Military Science or Physical Education	6-4
Departmental requirements and Electives to bring total credits to 130.	

MAJOR SPECIALTIES AVAILABLE FOR B.S. (ENGINEERING SCIENCE) DEGREE—Chemical Engineering, Civil Engineering, Electrical Engineering, Mechanical Engineering.

GENERAL REQUIREMENTS FOR A B.S. DEGREE

English Composition and Literature, including Engl. 101-2	12 credits
Foreign Language—A first year (101-102) or a second year (201-202) of a Language approved by the Department Head. Students with two or three years of study of an approved language may petition to have this requirement removed by examination.	0-10
Social Science	9
Mathematics	9
Physics	8
Chemistry or Biology	8
Major Specialty (See Departmental Sections for specific requirements)	
Physical Education or Military Science	4-6
Departmental Requirements, Minor Specialties, and/or Electives—To bring total to 130 credits.	

MAJOR SPECIALTIES AVAILABLE FOR A B.S. DEGREE—Anthropology, Biological Sciences, Botany, Chemistry, Fisheries Biology, General Science, Geography, Geology, Geological Engineering, Home Economics, Mathematics, Medical Technology, Mining Engineering, Physics, Wildlife Management, Zoology.

MINOR SPECIALTIES AVAILABLE FOR A B.S. DEGREE—Refer to Departmental Section since some B.S. degree programs do not require minor specialties.

ASSOCIATE DEGREES

The associate degree is awarded upon the successful completion of a two-year technical or general program. The degree has its own integrity and for many people it will be their most advanced formal educational experience. For others, it will be the first undergraduate degree and a stepping stone to a baccalaureate program.

GENERAL REQUIREMENTS FOR AN ASSOCIATE DEGREE

English	6 credits
American Government or American History	6
At least 6 credits each in any three of the following areas:	18
(a) humanities, (b) social studies, (c) natural science, (d) mathematics, (e) other.	
Major specialty (See Department Sections for specific requirements)	20-30
Electives—To bring total credits to 60.	

GENERAL REQUIREMENTS FOR GRADUATE STUDY

Graduate study seeks to prepare the student for creative work—for all work that extends the bounds of knowledge, that cherishes and transmits knowledge, and that applies knowledge for the benefit of man. It seeks to give the student deeper insights and better understandings of fundamental principles. The graduate program is shaped to the needs of the individual student and is developed in terms of his experience, academic background, and aspirations. Earning an advanced degree entails more than the satisfactory completion of specified courses; the student must show promise and performance in productive scholarship.

MASTER'S DEGREES

As will be seen under departmental listings, programs leading to master's degrees are offered in the areas of botany, chemistry, civil engineering, creative writing, education, engineering management, English, fisheries, biology, general science, geology, geophysics, mathematics, mineral industry management, mineral preparation engineering, physics, wildlife management, and zoology. Students wishing to enroll for graduate study in any of these fields should obtain an application form from the Director of Admissions and Registrar's Office. The completed form and official transcripts of all previous college or university work should be returned to that office.

However, programs leading to master's degrees may be arranged on request in certain aspects of other subjects; for example, anthropology, business, economics, history, linguistics, etc. Students interested in pursuing studies in one of these or any other discipline not listed should write directly to the Vice President for Research and Advanced Study.

In general, a student may be admitted if he has a bachelor's degree from an accredited institution with at least a "B" average in his major and if his major is deemed suitable for continuation of studies in the field of his choice.

Department heads in fields of interest will determine the adequacy of the student's preparation and whether or not departmental facilities are sufficient for the student's aims. Applications from students whose projected programs do not fall within a department will be reviewed by a Committee for Admissions. Departmental or Committee recommendations will be transmitted to the student by the Director of Admissions.

As soon as the student is accepted, an Advisory Committee of not fewer than three faculty members will be set up to assist the student in planning and carrying out his program.

The requirement for a master's degree is a minimum of thirty semester credits, of which a maximum of twelve may be devoted to the thesis. At least nine semester credits, in addition to those earned for the thesis, must be at the 600 level. No lower division courses (100 or 200) are applicable. A maximum of nine semester credits from another institution may be transferred to the University of Alaska and applied toward a degree if approved by the Student's advisory committee and by the dean of the college in which the student is enrolled.

B is a minimum passing grade in courses not primarily for graduate students (300 or 400); C will be accepted in courses primarily for graduate students (600) provided a B average is obtained in graduate courses. Such standards are requisite for continuing study towards a master's degree.

A student may be admitted to candidacy for a specific master's degree after he has satisfied all the following requirements: 1) completed at least 8 credits of graduate study at the University of Alaska; 2) demonstrated a reading ability of a foreign language, if required; 3) received approval by the dean, if he is enrolled in a college, or by the Vice President for Research and Advanced Study, if not, of the provisional title of his thesis, if a thesis is required, and of his program of studies.

The candidate must pass a final examination, either written or oral; if a thesis is required, the examination will include a defense of the thesis. The Examining Committee shall consist of a candidate's Advisory Committee and one member of the faculty from a different college appointed by the Vice President for Research and Advanced Study.

All work toward the fulfillment of the requirements of a master's degree must be completed within seven years.

DOCTOR OF PHILOSOPHY DEGREE

No restrictions are placed on the disciplines that may be studied by students seeking doctoral degrees. There are established doctoral programs in certain aspects of geology, geophysics, oceanography, physics, and zoophysiology.

Prospective candidates in these, or other topics, should write to the Vice President for Research and Advanced Study outlining in some detail their previous training and interests for future study. Each application is reviewed by an Admissions Committee both in light of the applicant's qualifications and the faculty and facilities available on the campus relevant to the field of projected study.

The degree of Doctor of Philosophy is granted for proven ability and scholarly attainment. There are no fixed credit requirements for this degree at the University of Alaska. It is not the policy to confer this degree upon anyone whose entire academic experience has been at this University.

The student chooses a major line of study and, with the advice of his Advisory Committee, such lines of study in related fields as are necessary for achievement of a thorough and scholarly knowledge of his subject. With approval of his Advisory Committee, the student prepares a program for the degree, which, including applicable and acceptable work transferred from other institutions, shall represent approximately three full years of study beyond the bachelor's degree.

A grade average of B must be maintained in graduate course work.

Reading ability in two foreign languages is required for the doctorate. German, French, or Russian are usually taken, but alternatives may be substituted upon petition.

Admission to graduate study does not imply admission to candidacy for a degree. The student should seek admission to candidacy approximately one year before he, in consultation with his Advisory Committee, deems that he will have completed the requirements for his doctorate. A student may be accepted as a candidate by his Advisory Committee after 1) completing the equivalent of two academic years of graduate study, 2) completing at least one semester in residence at the University or Alaska, 3) meeting his foreign language requirement, 4) obtaining approval by his Advisory Committee of the title and synopsis of his dissertation, and 5) passing a qualifying examination set by his Advisory Committee.

The dissertation, which is expected to represent the equivalent of at least one full academic year's work at the University of Alaska, must be a contribution to knowledge.

After submitting the dissertation, the candidate must pass an oral examination supporting his dissertation. The examining committee will consist of a minimum of five members: the candidate's Advisory Committee supplemented by additional members appointed by the dean, when the student is enrolled in a college, and by the Vice President for Research and Advanced Study.

All work toward the fulfillment of a doctor's degree must be completed within ten years.

THESES AND DISSERTATIONS

Two copies of the thesis or dissertation, typed and bound (original and first carbon), must be filed in the University Library. Departments may require additional copies. All records of work done in connection with the preparation of theses and dissertations are the property of the University and can be released with the permission of the head of the department and the Vice President for Research and Advanced Study after having been reproduced by the University.

EXTENDED REGISTRATION FOR GRADUATE STUDENTS

A student who is working towards a higher degree must be registered. A student whose only remaining requirement is the removal of a deferred grade in Thesis or Special Topics must request the Registrar to allow him Extended Registration, at no cost, at the beginning of each semester until the deferred grade is removed. With the request, the student must state the approximate time at which he expects to complete the work. Upon receipt of such a request, the Registrar refers the request to the Chairman of the Student's Advisory Committee. With his approval, the student is considered as enrolled in the current semester.



Well-equipped laboratories are found in Colleges and Research Institutes.

Colleges of the University

Arts and Letters

**Behavioral Sciences
and Education**

**Biological Sciences and
Renewable Resources**

**Business, Economics
and Government**

**Earth Sciences and
Mineral Industry**

**Mathematics, Physical
Sciences and Engineering**



Language students "dial-a-lesson" in the modern, electronic language laboratory.

College of Arts and Letters

CHARLES J. KEIM—DEAN

The Humanities diversify the quest for knowledge in an era of specialization. Examining what men have thought and expressed, they keep knowledge current, expanding and general. Technique distinguishes them from subjects primarily using the empirical method of science, for there are truths which transcend verification. The study of languages breaks cultural fetters, directed reading builds appreciation, exposure to the fine arts quickens sensibility; and all, language, literature, and the arts, collaborate to make knowledge prevail and discovery imminent.

UNDERGRADUATE DEGREES—The College of Arts and Letters offers a Bachelor of Arts degree with majors in Art, English, French, German, Linguistics, Music, Philosophy, Russian, Spanish, and Speech (options in Public Address, Drama, and Broadcasting). The College offers minors for the Bachelor of Arts in these subjects and in Journalism. A major in Journalism is being planned for fall, 1966.

GRADUATE DEGREES—The College of Arts and Letters offers a Master of Arts degree in English and Master of Fine Arts degree in Creative Writing. Students also may earn both degrees in other fields through an interdisciplinary program.

ART DEPARTMENT

HELMUT G. VAN FLEIN—DEPARTMENT HEAD

DEGREE—BACHELOR OF ARTS

MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS

The program of the Art Department recognizes the responsibility of the Fine Arts within the Humanities. Courses in Art further and encourage independent, original and creative thinking. The language of art is universal and through it man's creative and intellectual endeavors become more meaningful.

REQUIREMENTS FOR A B.A. DEGREE WITH AN ART MAJOR

1. Complete general requirements for a B.A. degree as listed on page 50.
2. Complete a minimum of 37 hours of credit in Art courses. A maximum of 54 hours of credit in Art courses may be counted toward the degree.
3. Complete the following courses in Art:

Art 105-106—Freehand Drawing	4 credits
Art 207-208—Beginning Printmaking	4
Art 211-212—Beginning Sculpture	6
Art 213-214—Beginning Oil Painting	6
Art 261-262—History of World Art	6
Art 307—Intermediate Printmaking	2
Art 311—Intermediate Sculpture	3
Art 313—Intermediate Oil Painting	
and	
Art 407-408—Advanced Printmaking	4
or	
Art 411-412—Advanced Sculpture	6
or	
Art 413-414—Advanced Oil Painting	4
4. Transfer students who are candidates for the B.A. Degree with a major in Art must complete a minimum of 18 hours of credits in Art courses while in residence.
5. The Department of Art advises Art students to use French or German to meet their foreign language requirements.
A minor in Art requires 12 hours of approved Art courses.

ART PROGRAM FOR TEACHERS

Students who are preparing to teach Art must complete the requirements for an Education minor as required by the Department of Education.

For course descriptions, see page 109.

ENGLISH DEPARTMENT

JOSEPH W. MEEKER—DEPARTMENT HEAD

DEGREES—BACHELOR OF ARTS, MASTER OF ARTS, MASTER OF FINE ARTS

MINIMUM REQUIREMENTS FOR DEGREE: B.A.—130 CREDITS

M.A.—30 ADDITIONAL CREDITS

Writing and reading distribute ideas and make them available to all. Courses in the writing of English perfect expression, encourage creativity; the study of literature both delights and builds a regard for scholarship. Through its writing courses, its courses in language and literature, the department offers much to developing minds.

REQUIREMENTS FOR A B.A. DEGREE WITH AN ENGLISH MAJOR

1. Complete general requirements for a B.A. degree as listed on page 65.
 2. Complete 33 credits in English beyond English 101 and 102, including:

Engl. 239—Form and Technique of Poetry.....	3 credits
or	
Engl. 240—Form and Technique of Fiction.....	3
Not required of Junior and Senior transfer majors	
Engl. 423—Elizabethan Drama	3
or	
Engl. 424—Shakespeare	3
Engl. 421—Chaucer	3
Engl. 472—History of the English Language	3
- A minor in English requires 18 credits beyond English 101 and 102, including:
- | | |
|---|-----------|
| Engl. 421—Chaucer | 3 credits |
| or | |
| Engl. 472—History of the English Language | 3 |
| Engl. 423—Elizabethan Drama | 3 |
| or | |
| Engl. 424—Shakespeare | 3 |

For course description, see page 126.

REQUIREMENTS FOR A M.A. DEGREE IN ENGLISH

1. A minimum of 30 credits of approved courses including English 697-698, Thesis 6 credits.
 2. Completion of the general graduate degree requirements listed on page 51.
- For course descriptions, see page 126.

REQUIREMENTS FOR M.F.A. DEGREE IN CREATIVE WRITING

- | | |
|--|------------|
| 1. Graduate creative writing courses | 12 credits |
| 2. English electives | 15 |
| 3. Interdisciplinary electives | 12 |
| 4. Thesis | 9 |

JOURNALISM DEPARTMENT

JIMMY BEDFORD—DEPARTMENT HEAD

The complex world of today demands a tremendous corps of people with diverse backgrounds to write the material which appears in the rapidly expanding media of communication. Such writers inform, interpret, entertain and guide. The students may select courses which will enable them to communicate more effectively with the written word.

A major in Journalism is being planned for fall, 1966, but details were not available when the catalog went to press. For latest information write the department head. A Journalism minor is also offered.

For course descriptions, see page 135.

LINGUISTICS AND FOREIGN LANGUAGES DEPARTMENT**BRUCE R. GORDON—DEPARTMENT HEAD****DEGREE—BACHELOR OF ARTS****MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS**

In a shrinking world Americans increasingly need to communicate directly with other peoples in order to achieve mutual understanding. Whether it be Eskimo or English, the language of a people embodies its unique culture and way of thinking and feeling. Therefore, to know only one language is to think in only one way.

Linguistics is the science of language. The study of linguistics and of foreign languages and literatures liberates the student from the confines of his own culture and also makes his own culture more meaningful to him.

REQUIREMENTS FOR A B.A. DEGREE WITH A FOREIGN LANGUAGE OR LINGUISTICS MAJOR OR MINOR

Majors are offered in French, German, Linguistics, Russian, and Spanish.

1. Complete general requirements for a B.A. degree as listed on page 50, including foreign language requirement.
2. Complete 26 credits beyond first year in the major language.
3. Complete 3 credits in a Linguistics course.

A minor in a foreign language requires four semesters (12 credits) of study in that language beyond the 102 level.

For a major in Linguistics:

1. Complete general requirements for a B.A. degree as listed on page 50, including foreign language requirement.
2. Complete 4 semesters (12-16 credits) in language other than that offered as fulfillment of foreign language requirements towards the B.A. degree. Both languages must be chosen from French (or Latin or Spanish), Greek, German, or Russian.
3. Complete 15 credits in Linguistics courses.

A minor in Linguistics requires 12 credits in Linguistics.

Audio-lingual practice in the Language Laboratory is an integral part of all elementary and intermediate language courses.

MUSIC DEPARTMENT**CHARLES W. DAVIS—DEPARTMENT HEAD****DEGREE—BACHELOR OF ARTS****MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS**

The curriculums are designed to satisfy two principal objectives:

Culturally, to teach musical skills, knowledges, appreciations, and attitudes that in combination with the other arts and humanities contribute to an enriched life.

Professionally, to prepare teachers and musicians who, in addition to the above, are proficient in professional leadership. In the teaching of students as public school music teachers, the necessary specialization in the fields of music and education is adequately provided for in the curriculums leading to the B.A. degree.

The various music organizations maintained by the department offer participation experiences for students in all colleges of the University.

For course descriptions, see page 142.

REQUIREMENTS FOR A B.A. DEGREE WITH A MAJOR IN MUSIC OR MUSIC EDUCATION

For a major in Music:

1. Complete general requirements for a B.A. degree listed on page 50.
2. Complete 40 credits in Music including:

Music 131-132—Basic Theory	6 credits
Music 231-232—Advanced Theory	6
Music 321-322—History of Music	6
Music 331-332—Form and Analysis	4
Music 491-492—Senior Seminar	2
Applied Music, to include 8 credits of private lessons and 8 credits of ensemble participation	16

3. Prior to graduation, satisfy an examination in piano proficiency.

For a major in Music Education:

1. Complete general requirements for a B.A. degree listed on page 50.

2. Complete 40 credits in Music including:

Music 131-132—Basic Theory	6 credits
Music 231-232—Advanced Theory	6
Music 321-322—Music History	6

At least 6 credits from:

Music 315-316—Instrumental Methods	4
Music 415-416—Instrumental Methods	4
Applied Music, to include 6 credits of private lessons and 10 credits of ensemble participation, to include 2 semesters of a vocal ensemble.....	16

3. Complete a minor in Education, including either Music 343 or Music 344.

4. Prior to graduation, satisfy an examination in piano proficiency.

A minor in Music requires 12 credits in Music beyond Freshman courses.

MUSIC CURRICULUM

FALL SEMESTER

FIRST YEAR

15-17 CREDITS

Engl. 101—Comp. & Modes of Lit.....	3
Foreign Language 101 or 201	3-5
History 117	3
P. E. or Mil. Sci.	1 or 1½
Applied Music (Ensemble)	1
Applied Music (Private Lesson)	1
Music 131—Basic Theory	3

SPRING SEMESTER

15-17 CREDITS

Engl. 102—Comp. & Modes of Lit.....	3
Foreign Language 102 or 202	3-5
History 118	3
P. E. or Mil. Sci.	1 or 1½
Applied Music (Ensemble)	1
Applied Music (Private Lesson)	1
Music 132—Basic Theory	3

SECOND YEAR

16-17 CREDITS

English	3
Foreign Language 201 or 493	3
Lab. Science or Math.	4-5
P. E. or Mil. Sci.	1 or 1½
Applied Music (Ensemble)	1
Applied Music (Private Lesson)	1
Music 231—Advanced Theory	3

16-17 CREDITS

English	3
Foreign Language 202 or 494	3
Lab. Science or Math.	4-5
P. E. or Mil. Sci.	1 or 1½
Applied Music (Ensemble)	1
Applied Music (Private Lesson)	1
Music 232—Advanced Theory	3

THIRD YEAR

15-16 CREDITS

Humanities	3
Applied Music (Ensemble)	1
Applied Music (Private Lesson)	1
Music 321—History of Music	3
Music 307—Chamber Music	1
or	
Music 313—Opera Workshop	1-2
Elective (1st Minor)	3
Elective (2nd Minor)	3

15-16 CREDITS

Humanities	3
Applied Music (Ensemble)	1
Applied Music (Private Lesson)	1
Music 322—History of Music	3
Music 307—Chamber Music	1
or	
Music 313—Opera Workshop	1-2
Elective (1st Minor)	3
Elective (2nd Minor)	3

FOURTH YEAR

16-18 CREDITS

Music 331—Form and Analysis	2
Music 491—Senior Seminar	2
Applied Music (Ensemble)	1
Applied Music (Private Lesson)	1
Music 307—Chamber Music	1
Music 317—Collegium Musicum	1
or	
Music 313—Opera Workshop	2-3
Elective (1st Minor)	3
Elective (2nd Minor)	3
Elective (Social Science)	3

14-16 CREDITS

Music 332—Form and Analysis	2
Applied Music (Ensemble)	1
Applied Music (Private Lesson)	1
Music 307—Chamber Music	1
Music 317—Collegium Musicum	1
or	
Music 313—Opera Workshop	2-3
Elective (1st Minor)	3
Elective (2nd Minor)	3
Elective (Science)	3

MUSIC EDUCATION CURRICULUM

FALL SEMESTER

FIRST YEAR

15-17 CREDITS

Engl. 101—Comp. & Modes of Lit.	3
Foreign Language 101 or 201	3-5
History 117	3
P.E. or Mil. Sci.	1 or 1½
Applied Music (Ensemble)	1
Applied Music (Private Lesson)	1
Music 131—Basic Theory	3

Note: Music Education Majors who are instrumentalists must take at least two semesters of a vocal ensemble.

SPRING SEMESTER

15-17 CREDITS

Engl. 102—Comp. & Modes of Lit.	3
Foreign Language 102 or 202	3-5
History 118	3
P.E. or Mil. Sci.	1 or 1½
Applied Music (Ensemble)	1
Applied Music (Private Lesson)	1
Music 132—Basic Theory	3

SECOND YEAR

15 CREDITS

English	3
Foreign Language 201 or 493	3
Psy. 101—Intro. to Psychology	3
P.E. or Mil. Sci.	1 or 1½
Applied Music (Ensemble)	1
Applied Music (Private Lesson)	1
Music 231—Advanced Theory	3

15 CREDITS

English	3
Foreign Language 202 or 494	3
Psy. 252—Psych. of Adolescence	3
P.E. or Mil. Sci.	1 or 1½
Applied Music (Ensemble)	1
Applied Music (Private Lesson)	1
Music 232—Advanced Theory	3

THIRD YEAR

17-18 CREDITS

Humanities	3
Ed. 313—Educational Psych.	3
Lab. Science or Math.	4-5
Music 315—Instrumental Methods	2
Music 321—History of Music	3
Applied Music (Ensemble)	1
Applied Music (Private Lesson)	1

18-19 CREDITS

Humanities	3
Ed. 332—Tests & Measurements	3
Lab. Science or Math.	4-5
*Music 344—Educ. Music in Sec. School	3
Music 322—History of Music	3
Applied Music (Ensemble)	1
Applied Music (Private Lesson)	1

FOURTH YEAR

16-18 CREDITS

Music 343—Educ. Music in Elem. School	3
Ed. 421—Secondary School	3
Music 415—Instrumental Methods	2
Applied Music (Ensemble)	1
Music 307—Chamber Music	1
Music 317—Collegium Musicum	1
or	
Music 313—Opera Workshop	2-3
Elective (2nd Minor)	3
Elective (Social Science)	3

12-13 CREDITS

Ed. 452—Directed Teaching	6
Music 316—Instrumental Methods	2
Applied Music (Ensemble)	1
Music 307—Chamber Music	1
Music 317—Collegium Musicum	1
or	
Music 313—Opera Workshop	2-3
Elective (2nd Minor)	2

*Although the Music Department does not require that students include both Music 343 and 344 in the curriculum, both are recommended.

PHILOSOPHY DEPARTMENT

RUDOLPH W. KREJCI—DEPARTMENT HEAD

The courses in Philosophy are designed to confront the student with the fundamental problems of Western philosophical heritage and introduce him to independent reflection on them, thus broadening his perspectives for the various areas of specialization in science, the social sciences and humanities.

REQUIREMENTS FOR A B.A. DEGREE WITH A PHILOSOPHY

MAJOR OR MINOR

1. Complete general requirements for a B.A. degree.
2. Complete a year sequence in mathematics.
3. Complete 30 credits in Philosophy, including

Phil. 201—Introduction to Philosophy	3 credits
Phil. 204—Introduction to Logic	3

Choose 2 courses out of the following:

Phil. 21—Aesthetics	3 credits
Phil. 332—Ethics	3
Phil. 341—Epistemology	3
Phil. 342—Metaphysics	3
Complete Phil. 351-352—History of Philosophy	6
Complete Phil. 471—Contemporary Philosophical Problems	3
Choose two of the following:	
Phil. 481—Philosophy of Science	3
Phil. 482—Comparative Religion	3
Phil. 484—Philosophy of History	3
Complete one course Phil. 493 or 494—Special Topics	3

4. A minor in Philosophy requires 15 credits of approved Philosophy courses.
For course descriptions, see page 145.

SPEECH, DRAMA, AND RADIO DEPARTMENT

LEE H. SALISBURY—DEPARTMENT HEAD

DEGREE—BACHELOR OF ARTS

MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS

Throughout the ages man has made his thoughts and feelings known to others through the spoken word. At this time, perhaps more than ever before, it is recognized that if man is to take an active part in his society he must express himself clearly and effectively. The course offerings in Public Speaking are a means to this end.

The media of Theater and Broadcasting provide a more dramatic framework through which ideas and feelings may be expressed. Performance is the central means of study; individual development takes place within the framework of group activity.

The Speech, Drama, and Radio Department offers elective courses leading to a major or minor in Speech with options in Public Address, Drama, and Broadcasting.

REQUIREMENTS FOR A B.A. DEGREE WITH A SPEECH MAJOR

1. Complete general requirements for B.A. degree listed on page 50.
2. Complete 24 credits in Speech beyond Speech 211, including:

Speech 221—Introduction to Theater	3 credits
Speech 231—Introduction to Broadcasting	3
Speech 315—Phonetics	2
Speech 316—Voice and Diction	2
3. A Speech major may elect to take an option in Public Address by adding the following courses to those specifically required in 2. (Above)

Speech 212—Public Speaking II	2
Speech 313—Argumentation and Debate	2
Speech 314—Discussion	2
Speech 317—Oral Interpretation	3
4. A Speech major may elect to take an option in Drama by adding the following courses to those specifically required in 2. (Above)

Speech 223—Acting I	3
Speech 325—Theater Production	3
Speech 327—Makeup for Theater	2
Speech 425—Directing	
or	
Speech 323—Acting II	3
Psychology 101—Introduction to Psychology	3
5. A Speech major may elect to take an option in Broadcasting by adding the following courses to those specifically required in 2. (Above)

Speech 237—Announcing	2
Speech 333—Writing for Radio and Television	3
Speech 334—Radio-Television Advertising	
or	
Speech 433—Radio-Television News	3
Speech 335—Broadcast Production	3
6. A minor in Speech requires 12 credits of approved Speech electives.
For course descriptions, see page 155.

College of Behavioral Sciences and Education

CHARLES K. RAY—DEAN

The College of Behavioral Sciences and Education provides students an opportunity to develop an understanding of man in relation to his social, psychological and cultural background. Such knowledge serves to broaden the student's concept of life and conditions of society and to provide a foundation for service in specific professional fields.

UNDERGRADUATE DEGREES—The College has programs that lead to Bachelor of Arts degrees in Anthropology, Geography, Psychology, and Sociology. The Bachelor of Education degree is awarded to students majoring in Education.

GRADUATE DEGREES—A program leading to the Master of Education degree is offered to qualified students.

ANTHROPOLOGY AND GEOGRAPHY DEPARTMENT

DEGREES—BACHELOR OF ARTS AND BACHELOR OF SCIENCE

GRADUATE STUDY

See page 51.

MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS

The Department offers undergraduate level courses in Anthropology and Geography, and opportunities for research. A major can be obtained in both fields. Anthropology and Geography contribute to an understanding of the complex problems of human behavior; cultural and social organization and the relationship of man to the various environments. Archaeological and human ecological research carried out in the field and library provides information about past and present modes of living and of origins and distribution of peoples and cultures.

REQUIREMENTS FOR A B.A. DEGREE OR A B.S. DEGREE WITH AN ANTHROPOLOGY MAJOR

1. Complete general requirements for a B.A. or B.S. degree as listed on page 50.
2. Complete 20 credits beyond Anthropology 101 and 212, including:

Anth. 304—Africa	3 credits
Anth. 312—North American Archaeology	3
Anth. 331—Primitive Religion	3
Anth. 335—North American Ethnology	3
Anth. 336—Ethnology of Central and South America	3
Anth. 342—Alaska Natives	3
Anth. 423—Social Anthropology	3
3. Complete the following:

Soc. 101—Introduction to Sociology	3
Psy. 101—Introduction to Psychology	3
Geog. 201—Elements of Physical Geography	3
Geog. 316—Pleistocene Environment	3
Geog. 402—Man and Nature	3

A minor in Anthropology requires 12 hours of approved Anthropology courses.
For course descriptions, see page 108.

REQUIREMENTS FOR A B.A. DEGREE OR B.S. DEGREE WITH A GEOGRAPHY MAJOR

1. Complete general requirements for a B.A. or B.S. degree as listed on page
 2. Complete 20 credits in geography beyond Geography 101, including:

Geog. 201—Elements of Physical Geography	3
Geog. 316—Pleistocene Environment	3
Geog. 327—Cold Lands	3
Geog. 401—Weather and Climate	3
Geog. 402—Man and Nature	3
Geog. 491—Seminar	3
 3. Complete the following:

Land Res. 101—Conservation of Natural Resources	2
Biol. 303—Principles of Ecology	3
Geol. 101—General Geology	4
Geol. 102—Historical Geology	4
Anth. 101—The Study of Man	3
Anth. 212—Human Origins	3
- A minor in Geography requires 12 hours of approved Geography courses.
For course descriptions, see page 129.

EDUCATION DEPARTMENT

CHESTER E. YOUNGBLOOD—DEPARTMENT HEAD

DEGREES—BACHELOR OF EDUCATION AND MASTER OF EDUCATION

MINIMUM REQUIREMENTS FOR DEGREE: B.Ed.—130 CREDITS

M.Ed.—30 ADDITIONAL CREDITS

The Education Department offers curricula designed to prepare personnel for teaching in elementary and secondary schools. Students are introduced to fundamental problems of education in the contemporary world through courses designed to develop perspective and understanding of the relations of education to society. Courses provide information and practice in the development of instructional materials and the understanding of methods of instruction. Students are formally admitted to the program of teacher education on the basis of multiple criteria of their ability to make a positive contribution to the educational profession.

CERTIFICATION—Students may qualify for teaching certificates in various states only by planning their programs to meet specific requirements. Certificates are issued by the appropriate state department of education. In Alaska, certificates are granted by the Alaska Department of Education in Juneau. Students who obtain the B.Ed. degree will meet the current academic requirements for Alaskan certification. Any student minoring in Education must meet the Alaska certification requirements. Students seeking a minor in Education should consult with the Head of the Education Department during their freshman year to obtain specific requirements.

ADMISSION TO TEACHER EDUCATION—Any student wishing to prepare for teaching through the University of Alaska must formally apply for admission to teacher education. Students should consult with the Head of the Education Department at the beginning of his sophomore year to secure procedure for formal application for admission to the Teacher Education Program. Enrollment in education courses in no way implies admission to the Program of Teacher Education.

REQUIREMENTS FOR THE B.Ed. DEGREE WITH AN ELEMENTARY EDUCATION MAJOR

1. Military Science or Physical Education (2 years)..... 6-4 credits
2. Humanities (Art, English, Languages, Linguistics, Music, Philosophy, Speech) 20
 - a. Required Courses:

English 101 and 102—Composition & Modes of Literature	6
---	---
 - b. Recommended Courses:

English 213—Advanced Exposition	3
Music 243—Education, Music for the Classroom Teacher	3
Philosophy 201—Introduction to Philosophy	3
Speech 211—Public Speaking I OR Speech 316—Voice and Diction	2
3. Social Sciences (Anthropology, Economics, Geography, History, Home Economics 236, Political Science, Psychology, Sociology)..... 24
 - a. Required Courses:

History 117-118—European History OR History 131-132—History of the U.S.	6
Political Science 101-102—American Government	6
Psychology 101—Introduction to Psychology	3
Psychology 305—Child Development (formerly Psy. 251 and Psy. 301).....	5

- b. Recommended Courses:
- | | |
|---|---|
| Auth. 101—The Study of Man | 3 |
| Anth. 342—Alaska Natives | 3 |
| Economics 121-122—Principles of Economics | 6 |
| Geography 101—Introduction to Geography | 3 |
| History 341—History of Alaska | 3 |
| Sociology 101-102—Introduction to Sociology | 6 |
4. Mathematics
- The two following courses:
- | | |
|--|---|
| *Math 121—Introduction to Modern Algebra and Analysis | 4 |
| Math 205—Mathematics for Teachers | 3 |
| *Math 115—Foundations of Mathematics acceptable if completed previously. | |
5. Natural Sciences (Anthropology 302, Biological Sciences, Chemistry, Geography 201 & 401, Geology, Physics)
6. Education (students must maintain a 2.00 average in all education courses)
- a. Required Courses:
- | | |
|--|---|
| Ed. 313—Educational Psychology | 3 |
| Ed. 332—Tests and Measurements | 3 |
| Ed. 409—The Teaching of Reading | 3 |
| *Ed. 452—Student Teaching | 6 |
| *Candidates who have taught successfully three years in the public elementary schools may petition to be excused from Ed. 452. | |
- b. Nine credits from the following courses:
- | | |
|---|---|
| Ed. 301—Social Studies for Elementary Teachers | 3 |
| Ed. 302—Language Arts for Elementary Teachers | 3 |
| Ed. 304—Literature for Children | 3 |
| Ed. 306—Teaching of Science in Elementary Schools | 3 |
| Ed. 307—Teaching of Arithmetic (formerly Ed. 206) | 2 |
| Ed. 311—Audio-Visual Methods and Materials (formerly Ed. 202) | 3 |
| Ed. 323—Small Schools | 2 |
- c. Six credits from the following courses:
- | | |
|---|---|
| *Ed. 121—Introduction to Education | 2 |
| Ed. 345—Sociology of Education | 3 |
| Ed. 348—History of Education in the U. S. | 3 |
| Ed. 422—Philosophy of Education | 3 |
| Ed. 426—Principles and Practices of Guidance | 3 |
| *Ed. 441—School Law | 2 |
| Ed. 446—Public School Organization, Control & Support | 3 |
| *Ed. 121 and 441, if completed previously, are applicable to the above 6 credits. | |
| **Course has been eliminated. | |
7. A total of 36 credits (including 12 upper division credits) in any two of the following fields, with a minimum of 12 credits in either field:
- | | |
|---------------------|-------------------|
| Anthropology | Linguistics |
| Art | Mathematics |
| Biological Sciences | Music |
| Chemistry | Philosophy |
| *Classics | Physics |
| Economics | Political Science |
| English | Psychology |
| French | Russian |
| Geography | **Spanish |
| Geology | Speech |
| German | Sociology |
| History | |
- *No longer offered by the University.
 **Approved for a maximum of 18 credits.
 Credits earned in fulfillment of (2), (3), (4), and (5) above may be applied toward courses listed in (7) above.
8. Forty-eight credits of upper division courses, twenty-four of which must be completed at the University of Alaska.
9. Sufficient free electives to total 130 credits.

REQUIREMENTS FOR THE B.Ed. DEGREE WITH A SECONDARY EDUCATION MAJOR

1. Military Science or Physical Education (2 years) 6-4 credits
2. Humanities (Art, English, Languages, Linguistics, Music, Philosophy, Speech) - 20
- a. Required Courses:
- | | |
|---|---|
| English 101 and 102—Composition & Modes of Literature | 6 |
|---|---|
- b. Recommended Courses:
- | | |
|--|---|
| English 213—Advanced Exposition | 3 |
| Philosophy 201—Introduction to Philosophy | 3 |
| Speech 211—Public Speaking I OR Speech 316—Voice and Diction | 2 |

3. Social Sciences (Anthropology, Economics, Geography, History, Home Economics 236, Political Science, Psychology, Sociology) 24
- a. Required Courses:
- History 117-118—European History OR History 131-132—History of the U.S. 6
- Political Science 101 and 102—American Government 6
- Psychology 101—Introduction to Psychology 3
- Psychology 252—Psychology of Adolescence (formerly Psy. 302) 3
- b. Recommended Courses:
- Anth. 101—The Study of Man 3
- Anth. 342—Alaska Natives 3
- Economics 121 and 122—Principles of Economics 6
- History 341—History of Alaska 3
- Sociology 101 and 102—Introduction to Sociology 6
4. Mathematics and Natural Sciences (Anthropology 302, Biological Sciences, Chemistry, Geography 201 & 401, Geology, Physics) 8
5. Education (students must maintain at least a 2.00 average in all education courses) 24
- a. Required Courses:
- Ed. 313—Educational Psychology 3
- Ed. 332—Tests and Measurements 3
- Ed. 402 or 406 or 407 or 408—Methods 3
- *Ed. 452—Student Teaching 6
- *Candidates who have taught successfully three years in the public secondary schools may petition to be excused from Ed. 452.
- b. Six credits from the following courses:
- *Ed. 121—Introduction to Education 2
- Ed. 345—Sociology of Education 3
- Ed. 348—History of Education in the U.S. 3
- Ed. 421—Secondary Education (formerly Ed. 321) 3
- Ed. 422—Philosophy of Education 3
- Ed. 446—Public School Organization, Control, and Support 3
- *Students who took Ed. 121 before it was eliminated need only three other credits from (b) above.
- c. Three units of education electives selected from the following:
- Ed. 311—Audio Visual Methods and Materials (formerly Ed. 202) 3
- Ed. 323—Small Schools 2
- Ed. 426—Principles and Practices of Guidance 3
- *Ed. 431—Curriculum Development 3
- *Ed. 441—School Law 2
- *These courses have been eliminated but are applicable if completed previously.
6. Teaching Majors and Minors (students must maintain at least a 2.00 average in their teaching majors).
- Option A.
- Complete a teaching major of 24 to 36 approved credits and a teaching minor of 12 to 24 approved credits for a total of 48 credits of which at least 18 must be upper division. See advisor.
- Option B.
- Complete an integrated teaching major-minor of 48 approved credits. See advisor.

MAJOR OR MINOR (Option A)

Art
 Biological Sciences
 Business Education
 Chemistry
 English
 **Foreign Language
 History
 Home Economics
 Mathematics
 Music
 ***Physical Education
 Physics
 Speech

*Approved for History Major only.

**Confer with Head of the Department of Education.

***See page 50 for requirements for B.Ed. Degree with a major in Physical Education.

****No longer offered by the University.

*****Approved for History and Business Education Teaching Majors only.

MINOR ONLY (Option A)

****Classics
 *****Economics
 *Geography
 Journalism
 *Political Science
 *Sociology

INTEGRATED MAJOR-MINOR (Option B)

General Science
 Social Science
 Earth Sciences

- Credits earned in fulfillment of (2), (3), and (4) above may be applied toward the teaching major and teaching minor. The student is responsible for obtaining and keeping current his copy of the courses required for his teaching major and minor. Any deviations from the specified courses must be approved by written petition to the Head of the Education Department.
7. Forty-eight credits of upper division courses, twenty-four of which must be completed at the University of Alaska.
 8. Sufficient free electives to total 130 credits.

SECONDARY TEACHING CERTIFICATES FOR MAJORS IN OTHER DEPARTMENTS

All majors in other departments who wish to obtain an Alaskan secondary teaching certificate should confer with the Head of the Education Department in their freshman year to obtain course requirements and application procedure for admission to teacher education. It is essential that the student have the necessary prerequisites and admission to teacher education for placement in student teaching in the public schools. The following courses should be taken at the indicated times:

FALL SEMESTER		SPRING SEMESTER	
Sophomore	Psy. 101		*Psy. 252
Junior	*Ed. 313		*Ed. 332
Senior	*Ed. 421		*Ed. 452
	*Ed. 402 or 406 or 407 or 408		

*Students must maintain a 2.00 average in these courses.

REQUIREMENTS FOR ADMISSION TO STUDENT TEACHING

1. Elementary School—Kindergarten through Eighth Grade:
 - a. Prior and current full acceptance to Teacher Education.
 - b. A formal application on file with the Director of Student Teaching by November 1 for student teaching in the following spring semester and by March 15 for student teaching in the following fall semester.
 - c. A completed physical examination.
 - d. Completion of 100 credits leading to a bachelor's degree with a minimum G.P.A. of 2.00.
 - e. Completion of Psy. 101, Psy. 305, Math. 115 or Math. 121, Math. 205, Ed. 313, Ed. 332, Ed. 409, and two other elementary methods and materials courses.
 - f. A minimum G.P.A. of 2.00 in all required psychology and all education courses attempted, including a minimum G.P.A. of 2.00 in all elementary methods and materials courses attempted.
 - g. Approval of Committee on Admission to Teacher Education to enter student teaching.
2. Secondary Schools—Seventh Grade through Twelfth Grade:
 - a. Prior and current full acceptance to Teacher Education.
 - b. A formal application on file with the Director of Student Teaching by November 1 for student teaching in the following spring semester and by March 15 for student teaching in the following fall semester.
 - c. A completed physical examination.
 - d. Completion of 100 credits leading to a bachelor's degree with a minimum G.P.A. of 2.00.
 - e. Completion of a minimum of 24 approved credits in an approved teaching major with a G.P.A. of 2.00 or more.
 - f. Completion of Psy. 101, Psy. 252, Ed. 313, and Ed. 332 with a minimum G.P.A. of 2.00 in Psy. 252, Ed. 313, and Ed. 332.
 - g. A minimum G.P.A. of 2.00 in all education courses attempted.
 - h. Approval of Committee on Admission to Teacher Education to enter student teaching.

REQUIREMENTS FOR A M.Ed. DEGREE IN EDUCATION

1. A satisfactory score on a graduate entrance examination.
2. Completion of *minimum* of 30 credits of approved courses including methods of educational research and an independent project or thesis.
3. One year of satisfactory teaching experience or administrative experience or reasonable equivalency.
4. The equivalent of an undergraduate major in Education.
5. Passing a comprehensive examination.
6. Completion of the general graduate degree requirements listed on page 51. For course descriptions see page 120.

HEALTH, PHYSICAL EDUCATION AND RECREATION DEPARTMENT

FRANCIS F. PYNE—DEPARTMENT HEAD

The professional curriculum in physical education is designed to prepare qualified students to teach physical education, to coach athletic teams, and to direct recreational programs according to the needs of the State of Alaska. The curriculum provides for either a major or a minor in physical education to be coupled with the requirements of the Department of Education's teacher education program.

REQUIREMENTS FOR A B.Ed. DEGREE WITH A PHYSICAL EDUCATION MAJOR

1. Complete the general requirements for a B.Ed. degree as follows:
 - a. Military Science: 6 credits
 - b. Physical Education:
 - Women majoring in P.E. will complete P.E. 101 and P.E. 102.
 - Men majoring in P.E. are exempt from required physical education (P.E. 105, 106, 205, 206).
 - c. Humanities: 13 credits
 - Art 261 or Music 123; English 101, 102; Philosophy 201; Speech 211.
 - d. Social Sciences: 18 credits
 - Anthropology 342; Economics 121; History 341; Psychology 101, 252; Sociology 101.
 - e. Mathematics, Natural Science, Physical Science: 16 credits
 - Biology 105; Chemistry 104; Mathematics 121.
 - f. Education: 18 credits
 - Education 313, 332, 406, 426, 452.
2. Complete the following required professional courses:

P.E. 111—Principles of Physical Education	4 credits
P.E. 142—Personal and Community Health	3
P.E. 146—First Aid	2
P.E. 220—Physical Education for the Elementary School	3
P.E. 331—Sports Officiating	2
P.E. 358—History of Physical Education	3
P.E. 425—Organization and Administration of Physical Education	3
P.E. 440—Prevention and Care of Athletic Injuries	2
P.E. 103—Fundamentals of Sports—Tennis and Badminton	1
P.E. 211—Fundamentals of Sports—Volleyball and Soccer	1
P.E. 212—Fundamentals of Sports—Recreational Activities	1
P.E. 213—Fundamentals of Sports—Swimming	1
P.E. 214—Fundamentals of Sports—Skiing	1
P.E. 215—Fundamentals of Sports—Tumbling and Gymnastics	1
P.E. 216—Fundamentals of Sports—Rhythms	1
P.E. 301—Techniques in Physical Education—Basketball (Men)	2
P.E. 302—Techniques in Physical Education—Track & Field	2
P.E. 303—Techniques in Physical Education—Team Sports (Women)	2
P.E. 400—Techniques in Physical Education—Tumbling & Gymnastics	2
P.E. 401—Techniques in Physical Education—Aquatics & Rhythms	2
3. Teaching minor (will depend upon minor chosen.)
4. Electives to total 130 credits.
 Completion of the following courses is required for a MINOR in Physical Education.

P.E. 111—Principles of Physical Education	4 credits
P.E. 146—First Aid	2
P.E. 220—Physical Education for the Elementary School	3
P.E. 425—Organization and Administration of Physical Education	3
P.E. 440—Prevention & Care of Athletic Injuries—Required for MEN only ..	2
P.E. 103—Fundamentals of Sports—Tennis and Badminton	1
P.E. 211—Fundamentals of Sports—Volleyball and Soccer	1
P.E. 214—Fundamentals of Sports—Skiing	1
P.E. 215—Fundamentals of Sports—Tumbling & Gymnastics	1
P.E. 216—Fundamentals of Sports—Rhythms	1
P.E. 301—Techniques in Physical Education—Basketball (Men)	2
P.E. 302—Techniques in Physical Education—Track and Field	2
P.E. 303—Techniques in Physical Education—Team Sports (Women)	2

HOME ECONOMICS DEPARTMENT

LUCILE TROST—DEPARTMENT HEAD

DEGREE—BACHELOR OF SCIENCE

MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS

This curriculum strives to provide for preparation in professional careers in Home Economics and to offer students a sound background in nutrition, textiles, child development, foods and clothing as well as experience in the liberal arts.

HOME ECONOMICS CURRICULUM**FALL SEMESTER****FIRST YEAR****16 CREDITS**

Engl. 101—Comp. & Modes of Lit.	3
H.E. 102—Meal Management	3
H.E. 121—Related Art	2
Chem. 101—Gen. Chemistry	4
P.E. 101—Phys. Ed.	1
Electives	3

SECOND YEAR**16 CREDITS**

Psy. 101—Intro. to Psy.	3
P.E. 201—Phys. Ed.	1
H.E. 211—Textiles	3
English Elective	3
Biol. 105—Fund. of Biol.	4
Elective	2

THIRD YEAR**16 CREDITS**

Econ. 121—Prin. of Econ.	3
H.E. 312—Adv. Clothing	3
Electives	12

FOURTH YEAR**17 CREDITS**

H.E. 441—Family Health	2
H.E. 445—Home Mgt.	3
Electives	12

SPRING SEMESTER**15 CREDITS**

Engl. 102—Comp. & Modes of Lit.	3
H.E. 241—Home Mgt. Res.	3
H.E. 113—Cloth. Const. & Sel.	3
H.E. 122—Related Art	2
P.E. 102—Phys. Ed.	1
Soc. 101—Intro. to Soc.	3

16 CREDITS

H.E. 236—Marriage & Fam. Life	3
P.E. 202—Phys. Ed.	1
H.E. 302—Advanced Foods	3
English Elective	3
Speech 211—Public Speaking	3
Elective	3

17 CREDITS

H.E. 304—Nutrition	3
H.E. 305—Child Develop.	5
Electives	9

17 CREDITS

H.E. 446—House Plan. & Furn.	3
Electives	14

Science Requirement—A minimum of 12 credits in Natural or Physical Sciences is required.

All electives must be approved by the Head of the Department. Approximately sixty credit hours must be liberal, including natural and social sciences and the humanities.

TEACHING CERTIFICATES—Home Economics graduates may qualify for teaching Vocational Home Economics. They may obtain an Alaskan teaching certificate by completing Education 407, Methods of Teaching Home Economics, and meeting the other requirements of the State Department of Education.

A minor in Home Economics requires a minimum of 12 approved credits in Home Economics.

For course descriptions, see page 134.

MILITARY SCIENCE DEPARTMENT**LIEUTENANT COLONEL JOHN B. DeMARCUS—DEPARTMENT HEAD**

The mission of the Reserve Officers Training Corps is to produce junior officers who by their education, training, and inherent qualities are suitable for continued development as officers in the United States Army; to give students such basic military training as will be of benefit to themselves and to the military service; and to assist in qualifying students for positions of leadership in industries and professional careers.

The program of instruction prescribed by the Department of the Army for Senior Division R.O.T.C. is divided into the Basic Course for freshmen and sophomores, and the Advanced Course for juniors and seniors.

BASIC COURSE—Required. All regularly enrolled, physically fit male students, without previous military training, who are citizens of the United States and are between the ages of 14 and 23 years, are required to satisfactorily complete the Basic Course R.O.T.C.

ADVANCED COURSE—Elective. Those students who successfully complete the Basic Course may apply for enrollment in the Advanced Course. Candidates must be physically qualified, recommended by the PMS and approved by the University President. Veterans may be allowed credit for prior active Federal Service in lieu of the Basic Course for the purpose of admission in to the Advanced Course.

A contract, signed by the students who enroll in the Advanced R.O.T.C. courses, makes satisfactory completion of these courses a prerequisite for graduation.

FLIGHT TRAINING—Department of the Army sponsors an Army Flight Training program for senior R.O.T.C. cadets at the University of Alaska. This training program consists of 73 hours of instruction at a civilian flying school in the Fairbanks area. Successful completion of the course qualifies the student for a private pilot's license. Prerequisites: Completion of the Junior year of R.O.T.C. and approval of the PMS and Academic Vice-President. Applicants must also pass the Army Flight Training physical examination and aptitude test.

Necessary texts, flying clothes, cost of lessons and transportation are furnished by the Department of the Army.

UNIFORMS AND EQUIPMENT—Members of the Basic and Advanced Course are furnished uniforms and texts by the United States Army.

Regulation gymnasium shoes, available through the University Book Store, are required to be worn during Leadership Laboratory (drill). These shoes must be purchased by the individual student.

ALLOWANCE—Advanced Course students receive a subsistence payment that amounts to approximately \$1,000.00 for the two year period.

ACADEMIC MINOR—Eighteen credits in Military Science may be accepted by an academic advisor as fulfilling the graduation requirements for a minor.

AWARDS—Awards are made annually for outstanding achievement in R.O.T.C. band, drill team, rifle team, ski team; for best individual, squad, and platoon in drill; to the outstanding cadet in each class.

R.O.T.C. RIFLE TEAM—The R.O.T.C. rifle team competes in shoulder matches with both civilian and military teams in the state. Each year the team fires in Inter-collegiate Match in competition with west coast schools. Postal matches are fired against university and college teams throughout the United States. The finest target rifles, shooting coats and gloves, targets, and ammunition are available to all R.O.T.C. cadets at no cost. Varsity letters are awarded.

R.O.T.C. BAND AND DRILL TEAM—The R.O.T.C. band and drill team participate in the Annual Winter Carnival in Fairbanks, at formations of the R.O.T.C. Cadet Corps, and at functions on campus.

TRANSFER STUDENTS—Transfer students with less than sophomore standing are required to enroll in Military Science unless excused by the Professor of Military Science.

EXEMPTIONS FROM BASIC COURSE—Students who petition the Professor of Military Science for exemption from military training must enroll in the prescribed course and pursue the work of the course until they have been formally notified that they are exempt. Such petition must be filed with the Professor of Military Science not later than two weeks following date of registration.

DEFERMENT FROM DRAFT—Students, upon successful completion of the first semester Basic Course, and continued enrollment in R.O.T.C., may be deferred from induction under the provisions of the Universal Military Training and Service Act.

For course descriptions, see page 140.

PSYCHOLOGY AND SOCIOLOGY DEPARTMENT

FRANK Q. SESSIONS—DEPARTMENT HEAD

DEGREE—BACHELOR OF ARTS

MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS

Psychology seeks to guide the student in an understanding of himself and of others in the area of experience and reaction to the milieu.

The field of Psychology has relevance for students preparing for careers in law, medicine, social work, education, industrial relations, and government service.

Psychology majors are specifically prepared for graduate work in major universities throughout the United States.

Sociology is a field in social science concerned with the behavior of people in groups, particularly societies, culture, and institutional arrangements under which people live. It is concerned with contemporary civilization.

REQUIREMENTS FOR A B.A. DEGREE WITH A PSYCHOLOGY MAJOR

1. Complete general requirements for a B.A. degree as listed on page 50.
2. Complete 24 credits in psychology beyond Psy. 101, 102, including:

Psy. 205—Statistics for Behavioral Sciences	3 credits
Psy. 213, 214—Experimental Psychology	6
Psy. 304—Abnormal Psychology or	
Psy. 209—Social Psychology	3
Psy. 491—Seminar in Human Behavior	2
3. A minor in Psychology requires 12 approved credits in Psychology.

REQUIREMENTS FOR A B.A. DEGREE WITH A SOCIOLOGY MAJOR

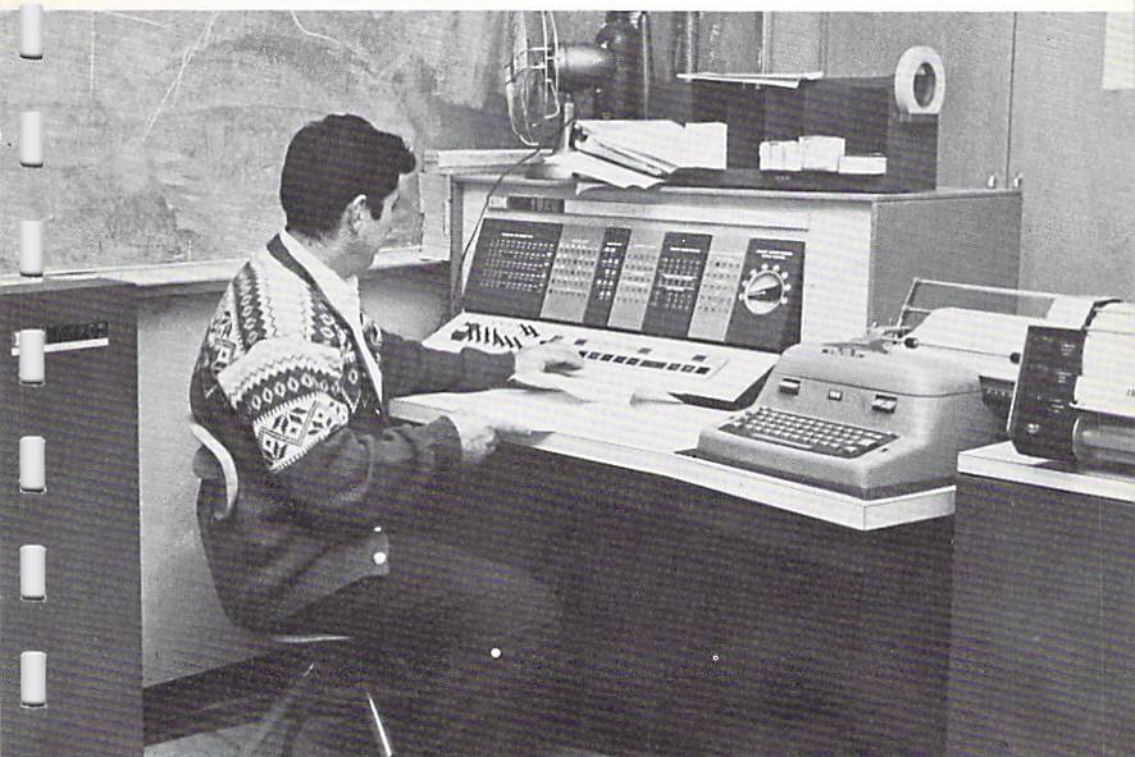
1. Complete general requirements for a B.A. degree as listed on page
2. Complete 24 credits in Sociology beyond Sociology 101, 102, eighteen units of which must be upper division and must include:

Soc. 434—Social Science Research Methods	3 credits
Soc. 491—Seminar in Human Behavior	2
3. Complete nine units chosen from the following:

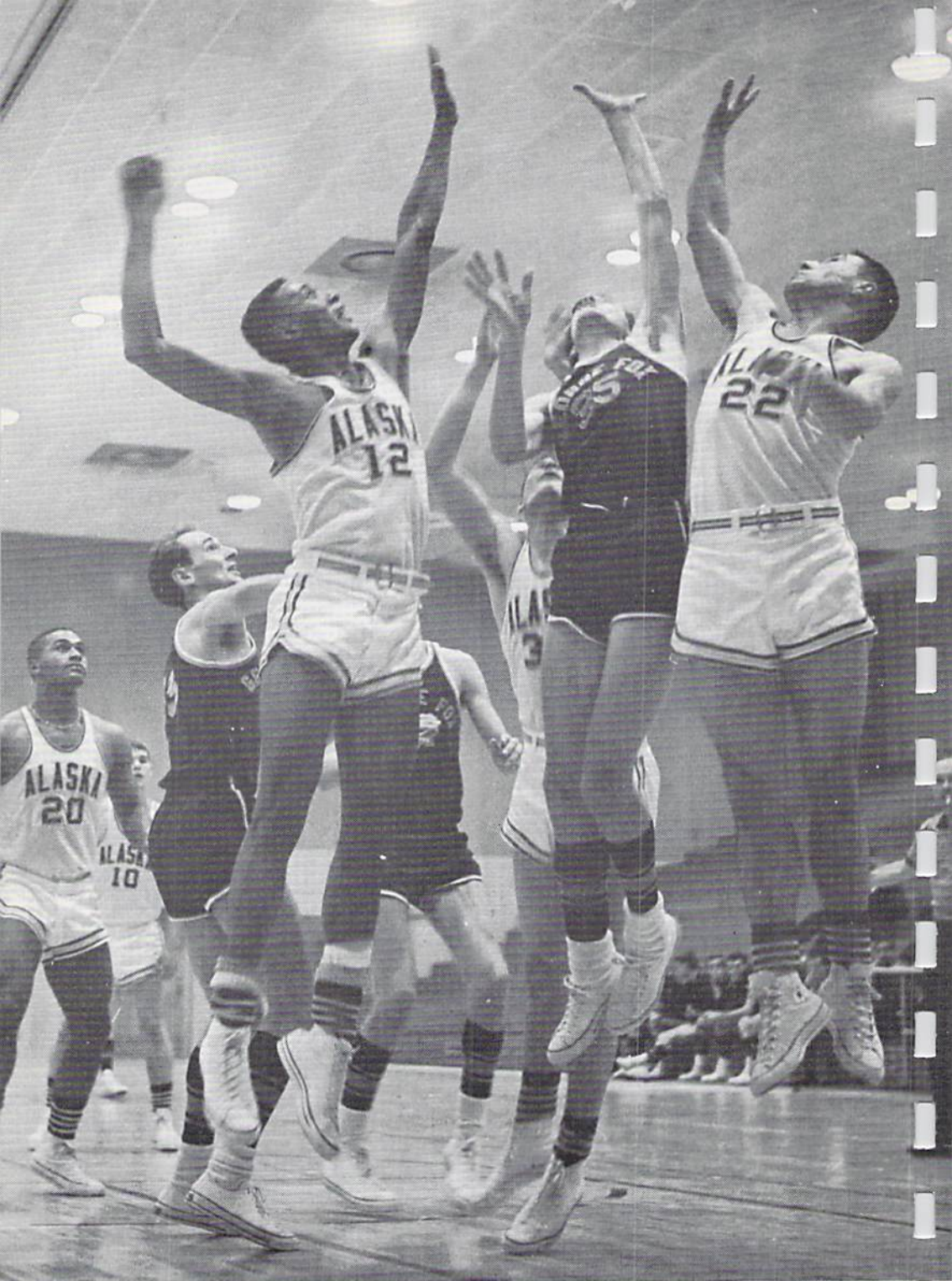
Psy. 209—Social Psychology	3
Soc. 304—Culture and Personality	3
Soc. 410—Social Theory	3
Soc. 209—Urban Sociology	3
Soc. 232—Family and Society	3
Soc. 205—Group Processes	3
4. Complete the following:

Anth. 101—The Study of Man	3
----------------------------------	---

 A minor in Sociology requires 12 elective credits in Sociology.
 For course descriptions, see page 154.



An IBM 1620 Data Processing System forms the core of a campus-wide computer center.



Basketball is a major sport, along with swimming, skiing, hockey and riflery.

College of Biological Sciences and Renewable Resources

BRINA KESSEL—DEAN

Biology is an area of science in which many disciplines come to bear; in fact, biology is in large part the summation of these various disciplines. A thorough knowledge of biology, in both its pure and applied phases, is fundamental to the welfare of mankind. With these axioms in mind, the programs in the College of Biological Sciences and Renewable Resources are designed to give students an introduction to the humanities and social sciences, a background in mathematics and the physical sciences, a firm foundation in basic biological sciences, and advanced training in specialized fields. For more details, students should read descriptive materials in the departmental sections below—Biological Sciences Department, Land Resources and Agricultural Science Department, and Wildlife Management Department.

DEGREES—Bachelor of Arts in Biological Sciences, Botany, Zoology; Bachelor of Science in Biological Sciences, Botany, Fisheries Biology, Medical Technology, Wildlife Management, Zoology; Master of Science in Botany, Fisheries Biology, Wildlife Management, Zoology.

LAND RESOURCES AND AGRICULTURAL SCIENCE DEPARTMENT

ARTHUR S. BUSWELL—DEPARTMENT HEAD

The curriculum for the first two years is designed to provide the basic science foundation on which advanced courses are based. The curriculum is intended for students who expect to prepare for careers in wildland utilization (watershed management, forest resources, range management, recreation and conservation, etc.) and in agriculture.

Opportunities for summer employment are available through various State and Federal Agencies and through the University's Agricultural Experiment Station.

CURRICULUM

FALL SEMESTER

FIRST YEAR 16 or 16½ CREDITS

Engl. 101—Comp. & Modes of Lit.	3
Biol. 105—Fund. of Biology	4
Mathematics	4
Chem. 101—General Chem.	4
P.E. or Mil. Sci.	1 or 1½

SECOND YEAR 17 or 17½ CREDITS

Phys. 103—Coll. Physics	4
Geol. 101—Gen. Geology	4
Econ. 121	3
Engl. 213—Adv. Comp.	3
Elective	2
P.E. or Mil. Sci.	1 or 1½

SPRING SEMESTER

16 or 16½ CREDITS

Engl. 102—Comp. & Modes of Lit.	3
Biol. 106—Fund. of Biology	4
Mathematics	4
Chem. 102—General Chem.	4
P.E. or Mil. Sci.	1 or 1½

16 or 17½ CREDITS

Phys. 104—Coll. Physics	4
Approved Biology Elective	4 or 3
Engl. Elective	3
Soc. Sci. Elective	3
Elective	2
P.E. or Mil. Sci.	1 or 1½

BIOLOGICAL SCIENCES DEPARTMENT

BRINA KESSEL—DEPARTMENT HEAD

DEGREES—BACHELOR OF ARTS, BACHELOR OF SCIENCE, MASTER OF SCIENCE

MINIMUM REQUIREMENTS FOR DEGREE: B.A.—130 CREDITS

B.S.—130 CREDITS

M.S.—30 ADDITIONAL CREDITS

The curricula in the Biological Sciences Department are designed to give the student a broad education as well as a sound foundation in the basic principles of biology. Students pursuing either a B.A. or a B.S. degree may have majors in botany, zoology, or biological sciences. A major in medical technology is also available for B.S. degree candidates. The B.A. degree requirements include fewer credits in the major field, but give greater emphasis in the fields of social sciences and humanities and allow a greater breadth of subject matter in the curricula. The requirements for the B.S. degree include a foundation in the basic sciences as well as a stronger major within the Biological Sciences Department. Candidates for a B.S. degree may select either the general biology program (Program I), a more specialized option in Zoology, Vertebrate Zoology, or Botany (Program II), or a major in Medical Technology. Candidates who expect to teach in public secondary schools must be sure that Education requirements are met.

REQUIREMENTS FOR A B.A. DEGREE WITH A MAJOR IN BIOLOGICAL SCIENCES

1. Complete general requirements for a B.A. degree as listed on page 50.
2. Complete the following foundation courses:

Biol. 105-106—Fund. of Biol.	8 credits
Mathematics, an approved year's sequence	6
3. Complete the following required courses:

Biol. 317-318—Comp. and Dev. Anatomy	10
Biol. 413—Cell Physiol., or Biol. 414—Comp. Physiol., or Biol. 416—Plant Physiol.	3-4
Biol. 302—Genetics	3
Biol. 303—Ecology, or one of the following:	
Biol. 233—Morph. Nonvasc. Plants	
Biol. 234—Morph. and Anat. Vasc. Plants	
Biol. 305—Invert. Zool.	
Biol. 331—Syst. Botany	3-4
4. Attend Biol. 491-492 (Seminar) during Junior and Senior years.
5. Complete requirements for an Education minor as required by the Department of Education.
A minor in Biological Sciences requires 14 credits, consisting of Biol. 105-106, 302, and 303.

REQUIREMENTS FOR A B.A. DEGREE WITH A MAJOR IN BOTANY

1. Complete the general requirements for a B.A. degree as listed on page 50.
2. Complete the following foundation courses:

Biol. 105-106—Fund. of Biol.	8 credits
Chem. 101-102—General Chemistry	8
Mathematics, an approved year's sequence	6
3. Complete 22 credits in Biology, including:

Biol. 233—Morph. Nonvasc. Plants	3
Biol. 234—Morph. and Anat. Vasc. Plants	4
Biol. 302—Genetics	3
Biol. 303—Ecology	3
Biol. 331—Systematic Botany	4
Biol. 416—Plant Physiology	3
4. Attend Biol. 491-492 (Seminar) during Junior and Senior years.
A minor in Botany requires Biol. 105-106 and 8 credits in Botany.

REQUIREMENTS FOR A B.A. DEGREE WITH A MAJOR IN ZOOLOGY

1. Complete the general requirements for a B.A. degree as listed on page 50.
2. Complete the following foundation courses:

Biol. 105-106—Fund. of Biol.	8 credits
Chem. 101-102—General Chemistry	8
Mathematics, an approved year's sequence	6
3. Complete 21 credits in Biology, including:

Biol. 302—Genetics	3
Biol. 317-318—Comp. and Dev. Anatomy	10
Biol. 413—Cell Physiol.	
or	
Biol. 305—Invert. Zool.	3-4
Biol. 414—Comp. Physiol.	4
4. Attend Biol. 491-492 (Seminar) during Junior and Senior years.
A minor in Zoology requires Biol. 105-106 and 8 credits in Zoology.

REQUIREMENTS AND CURRICULUM FOR A B.S. DEGREE WITH MAJORS IN BIOLOGICAL SCIENCES, BOTANY, OR ZOOLOGY

FALL SEMESTER

FIRST YEAR 16 or 16½ CREDITS

Engl. 101—Comp. & Modes of Lit.	3
Biol. 105—Fund. of Biology	4
*Mathematics	4
Chem. 101—General Chem.	4
P.E. or Mil. Sci.	1 or 1½

SECOND YEAR 17 or 18½ CREDITS

Phys. 103—Coll. Physics	4
Program I or II Requirement	4 or 5
Foreign Language 101	5
Soc. Sci. Elective	3
P.E. or Mil. Sci.	1 or 1½

SPRING SEMESTER

16 or 16½ CREDITS

Engl. 102—Comp. & Modes of Lit.	3
Biol. 106—Fund. of Biology	4
*Mathematics	4
Chem. 102—General Chem.	4
P.E. or Mil. Sci.	1 or 1½

17 or 18½ CREDITS

Phys. 104—Coll. Physics	4
Program I or II Requirement	4 or 5
Foreign Language 102	5
Soc. Sci. Elective	3
P.E. or Mil. Sci.	1 or 1½

*Acceptable mathematics sequences include Math. 121-122; Math. 107-108-109; Math. 106-200.

A proficiency equivalent to two college years of a foreign language is required for graduation. Students with two to four years of an approved language in high school may enter the third or fourth semester of a language or have the requirement waived, whichever is appropriate.

All electives must be approved by the Head of the Department of Biological Sciences.

THIRD & FOURTH YEARS 67 CREDITS

Foreign Language 201	3	Foreign Language 202	3
Geol. 101—General Geology	4	Engl. Elective	3
Engl. Elective	3	Biol. 492	0-1
Soc. Sci. Elective	3	Program I or Program II and	
Biol. 491	0-1	Electives	40-44

PROGRAM I REQUIREMENTS FOR A B.S. DEGREE WITH A MAJOR IN BIOLOGICAL SCIENCES

1. Biol. 302—Genetics	3 credits
2. Biol. 303—Ecology	3
3. Biol. 305—Invertebrate Zoology	4
4. Biol. 413—Cell. Physiol.	3
5. Biol. 414—Comp. Physiol. or Biol. 416—Plant Physiol.	4-3
6. Biol. 317-318—Comp. and Dev. Anatomy	10
7. Nine hours from the following:	
Biol. 233—Morph. of Nonvasc. Plants	
Biol. 234—Morph. and Anat. of Vasc. Plants	
Biol. 307—Parasitology	
Biol. 323—Mammalogy	
Biol. 324—Ornithology	
Biol. 326—Ichthyology	
Biol. 331—Systematic Botany	
Geol. 413—Vertebrate Paleontology	9

Program I must include a minimum of 6 hours each of botany and zoology, excluding Biol. 302, 303, and 413.

PROGRAM II REQUIREMENTS FOR A B.S. DEGREE WITH OPTION LEADING TO MAJORS IN ZOOLOGY, VERTEBRATE ZOOLOGY, AND BOTANY

Program II is designed for students desiring greater specialization in their junior and senior years.

REQUIREMENTS FOR AN OPTION IN ZOOLOGY

(Math. 101-102, Math. 121-122 or their equivalent must be completed to meet the mathematics requirement.)

Biol. 302—Genetics	3 credits
Biol. 305—Invert. Zool.	
or	
Biol. 307—Parasitology	4-3
Biol. 317-318—Comp. and Dev. Anatomy	10
Biol. 413—Cell Physiol.	3
Biol. 414—Comp. Physiol.	4
Chem. 212—Quantitative Analysis	4
Chem. 321-322—Organic Chem.	8

REQUIREMENTS FOR AN OPTION IN VERTEBRATE ZOOLOGY

Biol. 302—Genetics	3 credits
Biol. 303—Ecology	3
Biol. 305—Invert. Zool.	4
Biol. 317-318—Comp. and Dev. Anatomy	10
Biol. 414—Comp. Physiol.	4
Biol. 323—Mammalogy	3
Biol. 324—Ornithology	3
Biol. 326—Ichthyology	3
Biol. 331—Systematic Botany	4
Chem. 223—Organic Chem.	
or	
Biol. 413—Cell Physiol.	3-4

REQUIREMENTS FOR AN OPTION IN BOTANY

Biol. 233—Morph. Nonvascular Plants	3 credits
Biol. 234—Morph. and Anat. Vasc. Plants	4
Biol. 302—Genetics	3
Biol. 303—Ecology	3
Biol. 331—Systematic Botany	4
Biol. 413—Cell Physiol.	3
Biol. 416—Plant Physiol.	3
Upper division biology or chemistry course	3
Chem. 321-322—Organic Chem.	8

REQUIREMENTS AND CURRICULUM FOR A B.S. DEGREE WITH A MAJOR IN MEDICAL TECHNOLOGY

To receive a Bachelor of Science Degree in Medical Technology, a student must have six semesters of collegiate training at an accredited college or university, three of which must be at the University of Alaska with a G.P.A. of at least 2.0, and he must fulfill all requirements of the University for the Bachelor of Science degree, plus the basic requirements as set forth by the Registry of Medical Technologists. The student then becomes a candidate to enter an affiliated school of medical technology, and, if accepted, registers for Biol. 401 at the University of Alaska and spends a 12-month internship at the affiliated school. The University is affiliated with three ASCP-approved, non-denominational schools of medical technology—St. Luke's Hospital School of Medical Technology, Spokane, Washington; Tacoma General Hospital School of Medical Technology, Tacoma, Washington; and The Swedish Hospital School of Medical Technology, Seattle, Washington. Upon the satisfactory completion of Biol. 401 and the other above-mentioned University requirements, the student is eligible to receive a Bachelor of Science degree from the University of Alaska. He also is eligible to take the registry examination as a Medical Technologist under standards set by the Board of Registry of the American Society of Clinical Pathologists. Upon registration, the graduate is privileged to add the initials M.T. (ASCP) after his name.

FALL SEMESTER

FIRST YEAR	15 or 15½ CREDITS
Engl. 101—Comp. & Modes of Lit.	3
Mathematics	3
Chem. 101—General Chem.	4
Biol. 105—Fund. of Biology	4
P.E. or Mil. Sci.	1 or 1½

SECOND YEAR	16 or 16½ CREDITS
Biol. 317—Comp. & Dev. Anatomy	5
Engl. 213—Adv. Comp.	3
Soc. Sci. Elective	3
*Approved Chem. Elective	4
P.E. or Mil. Sci.	1 or 1½

THIRD YEAR	17 or 18 CREDITS
Phys. 103—Coll. Physics	4
Biol. 307—Parasitology	
or	
Biol. 413—Cell Physiology	3
Foreign Language 101	5
Biol. 491—Seminar	0-1
Engl. Elective	3
Soc. Sci. Elective	3

FOURTH YEAR	30 CREDITS
Biol. 401—Medical Technology	30

*Chem. 223—Intro. Organic Chem. recommended.

SPRING SEMESTER

	15 or 15½ CREDITS
Engl. 102—Comp. & Modes of Lit.	3
Mathematics	3
Chem. 102—General Chem.	4
Biol. 106—Fund. of Biology	4
P.E. or Mil. Sci.	1 or 1½

	17 or 17½ CREDITS
Biol. 318—Comp. & Dev. Anatomy	5
Chem. 212—Quant. Anal.	4
Biol. 214—Microbiology	4
Soc. Sci. Elective	3
P.E. or Mil. Sci.	1 or 1½

	16 or 18 CREDITS
Phys. 104—Coll. Physics	4
Biol. 302—Genetics	3
Biol. 414—Comp. Physiol.	4
Biol. 492—Seminar	0-1
Foreign Language 102	5
Elective	0-2

PREPARATORY CURRICULA—MEDICINE, DENTISTRY, NURSING, VETERINARY MEDICINE

Students planning to become medical doctors, dentists, nurses, or veterinarians may enroll in the Biological Sciences Department. Most of the professional schools in these fields require one to three or four years of collegiate work before a student will be admitted. These years of preliminary academic work are offered by the Biological Sciences Department, where the student will follow a sequence of courses planned to meet the requirements of the particular professional field in which he is interested.

Most pre-medical students plan on four preliminary years. Usually these students follow a curriculum leading to a Bachelor of Arts degree with a major in Zoology and/or Chemistry or a curriculum leading to a Bachelor of Science degree with a major in Zoology or Chemistry, earning a bachelor's degree at the end of four years. Adjustments may be made to meet varying requirements. Pre-medical students who are accepted in medical school prior to finishing their bachelor's requirements and who have earned at least 100 hours of pre-professional work with a G.P.A. of 3.0 or better, may, upon the completion of certain course requirements, and upon the satisfactory completion of a year of medical school, petition to receive a bachelor's degree from the University of Alaska.

Pre-nursing students register as non-majors in the College of Biological Sciences and Renewable Resources. Course work is selected to meet the specific needs of individual students. In general, high school students interested in nursing should apply directly to an institution offering a full curriculum in nursing; those wishing to attend the University of Alaska should plan to transfer to an institution with a nursing program after one year.

STUDENTS FROM OTHER DEPARTMENTS

Students who wish a minor in the Department of Biological Sciences must have courses approved in advance by the Head of the Department of Biological Sciences. A minor will normally have requirements similar to those listed on page 50 for the B.A. degree.

Candidates for the Bachelor of Science degree in General Science wishing a major in Zoology, Botany or Biological Sciences must satisfy both the requirements of their major curriculum and those listed for B.A. degree majors on page 50.

REQUIREMENTS FOR A M.S. DEGREE WITH A BOTANY OR ZOOLOGY MAJOR

1. A minimum of 30 credits of approved courses, including Biol. 697-698, Thesis.
2. An examination attesting a reading knowledge of French, German, or Russian.
3. Completion of the general requirements for a graduate degree as listed on page 51.

For course descriptions, see page 111.

WILDLIFE MANAGEMENT DEPARTMENT

FREDERICK C. DEAN—DEPARTMENT HEAD

DEGREES—BACHELOR OF SCIENCE AND MASTER OF SCIENCE

MINIMUM REQUIREMENTS FOR DEGREE: B.S.—135 CREDITS

M.S.—30 ADDITIONAL CREDITS

Both the wildlife management and fisheries biology curricula in the undergraduate program in the Department of Wildlife Management are intended to provide a broad basic education and training. Holders of the bachelor's degree will be qualified to enter the management, law enforcement, and public information-education phases of wildlife work. Students contemplating careers in research, administration, advanced management work or teaching will find the bachelor's curricula solid foundations for graduate study. A program for teachers interested in conservation education is also available.

The geographic location of the University is particularly advantageous for the study of wildlife management. Spruce forest, aspen-birch forest, alpine tundra, bogs, and several types of aquatic habitats are within easy reach. Studies can be made in many other habitats ranging from the dense forests of Southeastern Alaska to the Arctic Coast.

Adequate study collections of plants and animals are available, and a 2,000-acre study area is near the campus. Undergraduates have ample opportunity for close association with the personnel of the Alaska Cooperative Wildlife Research Unit and the several local offices of the federal and state conservation agencies. These agencies usually hire a number of students for summer field work. Thus, an unusually good opportunity is available for students to gain experience and to make job connections.

Wildlife plays an extremely important part in the economy and recreation of Alaskans. Because of this, some courses in the department will be of interest to non-major students.

UNDERGRADUATE DEGREES—The Department of Wildlife Management offers a Bachelor of Science Degree with majors in Wildlife Management and Fisheries Biology.

GRADUATE DEGREES—The Department of Wildlife Management offers a Master of Science Degree in Wildlife Management and in Fisheries Biology.

REQUIREMENTS AND CURRICULA FOR A B.S. DEGREE WITH MAJORS IN WILDLIFE MANAGEMENT AND FISHERIES BIOLOGY

FALL SEMESTER

FIRST YEAR	16 or 16½ CREDITS
Biol. 105—Fund. of Biology	4
Chem. 101—General Chem.	4
Engl. 101—Comp. & Modes of Lit.	3
Math. 121—Intro. Algebra & Anal.	4
P.E. or Mil. Sci.	1 or 1½

SECOND YEAR	16 or 16½ CREDITS
Land Res. 101—Cons. Natural Res.	2
Biol. 317—Comp. & Dev. Anatomy	5
Phys. 103—College Physics	4
Chem. 223—Intro. Organic Chem. (Fisheries Major)	
or	
Geol. 101—Gen. Geology (Wildlife Major)	4
P.E. or Mil. Sci.	1 or 1½

SPRING SEMESTER

	16 or 16½ CREDITS
Biol. 106—Fund. of Biology	4
Chem. 102—General Chem.	4
Engl. 102—Comp. & Modes of Lit.	3
Math. 122—Intro. Algebra & Anal.	4
P.E. or Mil. Sci.	1 or 1½

	16 or 16½ CREDITS
Engl. 213—Adv. Comp.	3
Biol. 318—Comp. & Dev. Anatomy	5
Phys. 104—College Physics	4
Math. 204—Elem. Statistics	3
P.E. or Mil. Sci.	1 or 1½

MAJOR IN FISHERIES BIOLOGY

THIRD YEAR	12+ CREDITS*		10+ CREDITS*
W.M. 325—Scientific Sampling	3	W.M. 304—Wildlife Mgmt. Prin.	3
Biol. 303—Ecology	3	Biol. 302—Genetics	3
Biol. 326—Ichthyology	3	Foreign Language 202†	3
Foreign Language 201†	3		
FOURTH YEAR	11+ CREDITS*		12+ CREDITS*
W.M. 421—Hydrobiology	3	W.M. 410—Wildlife Techniques	3
W.M. 491—Seminar		W.M. 424—Ecology of Fishes	3
or		Biol. 414—Comp. Physiol.	4
W.M. 493—Special Topics	1	Engl. 314—Research Writing	3
Biol. 305—Invert. Zool.	4		
Econ. 121—Prin. of Economics	3		

* In Fisheries Biology major, 24 credits of electives must be completed; 3 of these must be in Biol. 233 or Biol. 331 or Biol. 416; 6 more must be from courses which will satisfy the University's social science requirement.

MAJOR IN WILDLIFE MANAGEMENT

THIRD YEAR	15+ CREDITS**		15+ CREDITS**
Biol. 303—Ecology	3	W.M. 304—Wildlife Mgmt. Prin.	3
Biol. 323—Mammalogy	3	Biol. 324—Ornithology	3
Biol. 331—Systematic Botany	4	C.E. 116—Mapping	3
or		Econ. 121—Prin. of Econ.	3
Land Res. 311—Soils	3	Foreign Language 202†	3
Foreign Language 201†	3		
W.M. 325—Scientific Sampling	3		
FOURTH YEAR	9+ CREDITS**		14+ CREDITS**
W.M. 421—Hydrobiology	3	W.M. 410—Wildlife Techniques	3
Biol. 326—Ichthyology	3	W.M. 424—Ecology of Fishes	3
Biol. 331—Systematic Botany	4	W.M. 492—Seminar	1
or		Biol. 414—Comp. Physiol.	4
Land Res. 311—Soils	3	Engl. 314—Research Writing	3

**In Wildlife Management major, 15 credits of electives must be completed; 6 of these must be from the courses which will satisfy the University's social science requirement.

†A proficiency equivalent to two college years of French, German, or Russian is required for graduation. Students with two to four years of one of these languages in high school may enter the third or fourth semester of the language or have the requirement waived, whichever is appropriate. Students entering this department are expected to have two high school years of one of these languages; students lacking this preparation must take 10 credits of first year language in college, thereby reducing their college electives.

All electives must be approved by the Head of the Department of Wildlife Management. A minimum of two months must be spent in the employ of an approved conservation agency before a student will be eligible for a bachelor's degree. Two typewritten copies of a report on the work done and the experience gained during this time must be approved by the Head of the Department.

Demonstration of proficiency in swimming is required for graduation.

REQUIREMENTS FOR A M.S. DEGREE WITH A MAJOR IN WILDLIFE MANAGEMENT OR FISHERIES BIOLOGY

1. A minimum of 30 credits of approved courses, including Wildlife Management 697-698, Thesis, in the field of Fisheries Biology or Wildlife Management.
2. For Fisheries Biology, an examination attesting a reading knowledge of French, German, or Russian.
3. Complete general requirements for a graduate degree as listed on page 51.
For course descriptions, see page 157.

GRADUATE STUDY IN WILDLIFE MANAGEMENT

The Department of Wildlife Management and the Alaska Cooperative Wildlife Research Unit cooperate in offering graduate work leading to the Master of Science degree. Thesis work can be done in either Fisheries or Wildlife Management. Persons desiring detailed information on the graduate program in Wildlife Management may obtain this from the Head, Department of Wildlife Management. The procedure to be followed in applying for admission to graduate study is outlined in the section on Admission to Graduate Study in this catalog.

The Alaska Cooperative Wildlife Research Unit offers a limited number of research assistantships; information on these and the Unit's program can be obtained from the Leader, Alaska Cooperative Wildlife Research Unit, University of Alaska, College, Alaska. Applications for these assistantships should be sent to the Unit Leader; such applications are supplementary to the application for admission for graduate study.



On the campus' west ridge the first two buildings of an 11-building complex for Arctic Research are completed.



Aquatic instruction, recreation and competitive events have a new, intercollegiate size swimming pool for a home.

College of Business, Economics and Government

The primary objective of the College is to provide courses of study which will prepare young men and women for careers of responsibility in private and public organizations and which will acquaint them with the kind of society in which they will live and work when they leave the University.

Specifically, the aims of the College are: (1) To educate students for positions in industry, government and other organizations which require analytical ability; (2) to provide those who wish to prepare themselves for positions of responsibility in industry and government with a basic understanding of the economic, political and social environment; (3) to offer courses in the fields of business, economics, history and political science which meet the needs of students who wish to major in any of these disciplines with the intention of preparing themselves for advanced study or entering the teaching profession; (4) to acquaint the students with the problems of economic, political and social development in Alaska and in the Northern region of which it is a part; and (5) to instruct students in social science research techniques.

DEGREES—The College offers the following degrees: Bachelor of Business Administration, Associate in Business Administration, and Bachelor of Arts.

GRADUATE STUDY

See page 51.

ACCOUNTING DEPARTMENT

HORACE W. DOMIGAN—DEPARTMENT HEAD

**DEGREE—BACHELOR OF BUSINESS ADMINISTRATION WITH A MAJOR
IN ACCOUNTING**

MINIMUM REQUIREMENTS FOR DEGREE: 130 CREDITS

The Accounting Department offers an extensive program for those interested in the fields of general accounting, auditing, cost accounting and taxation. The objective of the program is to provide a strong business background through understanding of accounting and to train students for employment in accounting work.

GRADUATE STUDY

See page 51.

REQUIREMENTS FOR A B.B.A. DEGREE WITH A MAJOR IN ACCOUNTING

1. Complete requirements for a B.B.A. Degree listed on page 50.

2. Complete the following required courses:

Acc. 315—Intermediate Accounting	3 credits
Acc. 316—Analysis of Financial Statements	3
Acc. 413—Federal and State Tax Accounting	3
Acc. 416—Advanced Accounting	3
Acc. 417—Cost Accounting	3
Acc. 418—Auditing	3
Approved upper division electives	8-10

BUSINESS ADMINISTRATION DEPARTMENT

ROBERT C. HARING—DEPARTMENT HEAD

DEGREES—BACHELOR OF BUSINESS ADMINISTRATION WITH A MAJOR IN
ADMINISTRATIONBACHELOR OF BUSINESS ADMINISTRATION WITH A MAJOR IN
MARKETINGBACHELOR OF BUSINESS ADMINISTRATION WITH A MAJOR IN
FINANCE**MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS**

The Business Administration Department offers professional training in the fields of administration, finance, and marketing to those individuals interested in entering industry or government upon graduation. The objective of the program is to prepare men and women to meet the complex problems of the political, economic, and social environment and to enable them to give efficient service to industry and government on the basis of their academic training.

GRADUATE STUDY

See Page 51.

REQUIREMENTS FOR A B.B.A. WITH A MAJOR IN ADMINISTRATION

1. Complete requirements for a B.B.A. Degree listed on page 50.

2. Complete the following required courses:

B.A. 361—Industrial Relations	3 credits
B.A. 363—Production Management	3
B.A. 424—Managerial Economics	3
B.A. 480—Organization Theory	3
Approved Upper Division Electives	14-16

REQUIREMENTS FOR A B.B.A. DEGREE WITH A MAJOR IN MARKETING

1. Complete requirements for a B.B.A. Degree listed on page 50.

2. Complete the following required courses:

B.A. 343—Introduction to Marketing	3 credits
B.A. 442—Marketing Institutions & Channels	3
B.A. 443—Marketing Theory and Analysis of Market Change	3
B.A. 480—Organization Theory	3
Approved Upper Division Electives	14-16

For course descriptions, see page 113.

REQUIREMENTS FOR A B.B.A. DEGREE WITH A MAJOR IN FINANCE

1. Complete requirements for a B.B.A. Degree listed on page 50.

2. Complete the following required courses:

B.A. 323—Corporate Organization and Finance	3 credits
B.A. 422—Corporate Financial Problems	3
B.A. 423—Investment Management	3
B.A. 359—Regulation of Industry	3
Approved Upper Division Electives	14-16

For course descriptions, see page 113.

ECONOMICS DEPARTMENT

HOWARD A. CUTLER—ACTING DEPARTMENT HEAD

DEGREE—BACHELOR OF ARTS

MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS

Economics is the study of those social activities of man which are concerned with the production, distribution, and consumption of goods and services. In today's complex world, nearly all social phenomena and problems have economic aspects. Organized knowledge of the functioning of our economy and of its relations with other economic systems is therefore essential to an understanding of the world in which we live.

The Department considers its goal of teaching to be three-fold: (1) to provide students with basic tools of analysis; and factual, statistical and descriptive materials which will assist them in discharging their duties as citizens. (2) To introduce students majoring in this department to the various fields of economics in order to prepare them for positions in business, government and graduate study. (3) To offer a course of study suitable for a minor in economics.

GRADUATE STUDY

See page 51.

REQUIREMENTS FOR A B.A. DEGREE WITH AN ECONOMICS MAJOR

1. Complete general requirements for a B.A. Degree listed on page 50.
2. Complete the following foundation courses:

Econ. 121-122—Principles of Economics	6 credits
Hist. 131-132—History of the U.S.	6
Math. 121, 122, 204	11
P.S. 101-102—American Government	6
Philosophy Electives	6
Behavioral Science: all in Psy. or in Soc.	6
3. Complete 27 credits of Economics as follows:

Econ. 321—Price and Allocation Theory	3
Econ. 324—Income and Employment	3

A student may take six credits for each of two of the following fields:

Econ. 337—Economic Development: Principles, Problems, and Policies..	
Econ. 432—Economic History of the U. S.	
Econ. 435—Economics of Resources	6

Monetary and Fiscal Economics

Econ. 350—Financial and Monetary Theory and Policy	
Econ. 351—Public Finance and Taxation	
B.A. 359—Regulation of Industry	6

International Economics

Econ. 463—International Economics I	
Econ. 464—International Economics II	
4. Approved Upper Division Economic Electives 9

A minor in Economics requires 15 credits of approved Economics electives.
For course descriptions, see page 119.

HISTORY DEPARTMENT

HERMAN E. SLOTNICK—DEPARTMENT HEAD

DEGREE—BACHELOR OF ARTS**MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS**

The History Department seeks to make the student aware of the cultural heritage of mankind, the great problems that man has faced throughout history and how he has sought to solve them.

Through the study of history, a student may prepare himself for a career in teaching, in the public service, or for advanced work in history and the other social sciences.

GRADUATE STUDY

See page 51.

REQUIREMENTS FOR A B.A. DEGREE WITH A HISTORY MAJOR

1. Complete general requirements for a B.A. Degree listed on page 50.
2. Complete the following foundation courses:

Econ. 121—Principles of Economics	3 credits
Hist. 117—Formation of European Civilization	3
Hist. 118—Development of Modern Europe	3
Hist. 131-132—History of the U. S.	6
P.S. 101-102—American Government	6
3. Complete 20 credits in History, including:

Hist. 475—Introduction to Historical Method	3
Approved Upper Division American History Electives	6
Approved Upper Division European History Electives	6

A minor in History requires 12 credits of History electives, 6 of which must be upper division.
For course description, see page 132.

POLITICAL SCIENCE DEPARTMENT

DAVID E. CLARKE—DEPARTMENT HEAD

DEGREE—BACHELOR OF ARTS

MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS

The study of political science is the study of man's efforts to create social organizations and processes compatible with his environment. Political science is intimately related to all of the social science disciplines. It is the study of the dynamics of human behavior in the various cultural, national, and international spheres.

The student of political science may prepare for teaching or for advanced study in law and social science, or prepare himself for a career in public service.

GRADUATE STUDY

See page 51.

REQUIREMENTS FOR A B.A. DEGREE WITH A POLITICAL SCIENCE MAJOR

1. Complete the general requirements for a B.A. Degree listed on page 50.

English	12 credits
Foreign Language	12-16
Social Science:	
Hist. 117-118	6
Econ. 121-122	6
Phil. 201	3
Mathematics and Natural Science:	
Math. 121-122	8
Laboratory course in physics or chemistry	8
Physical Education or Military Science	4-6

2. Complete the following required courses:

Psy. 205—(or equivalent) Statistics for Behavioral Scientists	3
P.S. 101—American Government	3
P.S. 102—Introduction to Political Science	3
P.S. 201—Comparative Politics: The Political Process	3
P.S. 202—Comparative Politics: Case Studies	3
P.S. 321—International Affairs	3
P.S. 322—International Law and Organization	3
P.S. 401-402—Political Behavior	6
P.S. 411-412—Political Theory	6

3. Complete two approved minors.

Complete elective courses to bring total credits to 130.

OFFICE ADMINISTRATION DEPARTMENT

MELBA F. PELOSI—DEPARTMENT HEAD

DEGREES—BACHELOR OF ARTS WITH A MAJOR IN OFFICE ADMINISTRATION

MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS

ASSOCIATE IN BUSINESS ADMINISTRATION DEGREE WITH A MAJOR IN
OFFICE ADMINISTRATION

MINIMUM REQUIREMENTS FOR ASSOCIATE DEGREE—60 CREDITS

The Department offers three courses of study in order to meet the different needs of those who plan to specialize in the field of office operations: (1) An extensive four-year program leading to the degree of Bachelor of Arts with a major in office administration. The objective of the curriculum is to provide the students with the knowledge, skills and abilities required of the efficient office administrator or executive secretary. (2) A four-year course leading to the degree of Bachelor of Arts with a major in Business Education. The objective of the curriculum is to prepare young men and women for the teaching of business subjects in the secondary schools. (3) An intensive two-year program in office administration leading to an Associate in Office Administration Degree.

REQUIREMENTS FOR A B.A. DEGREE WITH A MAJOR IN OFFICE ADMINISTRATION OR BUSINESS EDUCATION

1. Complete requirements for the B.A. Degree listed on page 50.
2. Complete the following required courses:

Acc. 215-216—Principles of Accounting	6 credits
O.A. 101-102—Shorthand (or approved electives)	6
O.A. 105—Intermediate Typewriting	2
O.A. 106—Advanced Typewriting	2
O.A. 201—Intermediate Stenography	3
O.A. 202—Advanced Stenography	3
O.A. 203—Office Machines	3
O.A. 231—Business Correspondence	3
O.A. 302—Secretarial Training	3
3. Social Science must include:

Econ. 121-122—Principles of Economics	6
B.A. 331—Business Law	3
4. Approved Upper Division Electives
5. The Following courses are required for a minor in education:

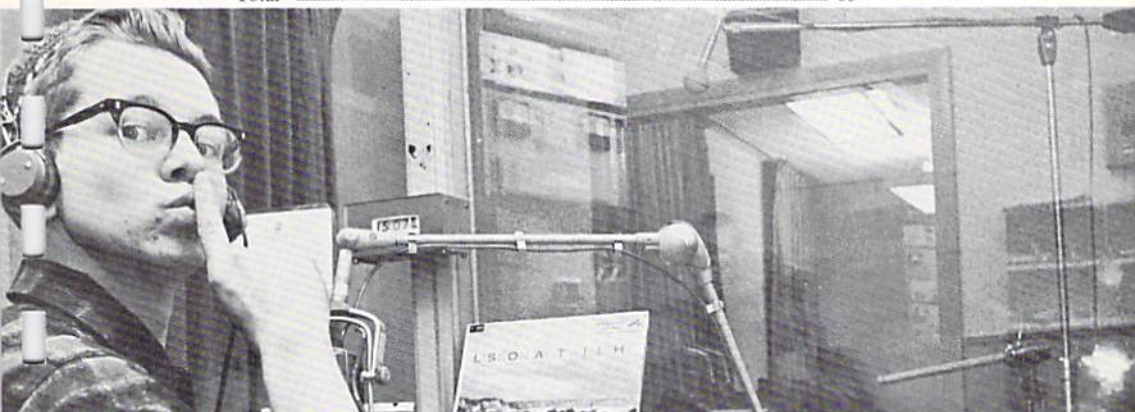
Psy. 101—General Psychology	3
Psy. 252—Psychology of Adolescence	3
Ed. 313—Educational Psychology	3
Ed. 421—Secondary Education	3
Ed. 332—Tests and Measurements	3
Ed. 408—Methods of Teaching Business Education Subjects	3
Ed. 452—Directed Teaching	6

REQUIREMENTS FOR AN A.B.A. DEGREE WITH A MAJOR IN OFFICE ADMINISTRATION

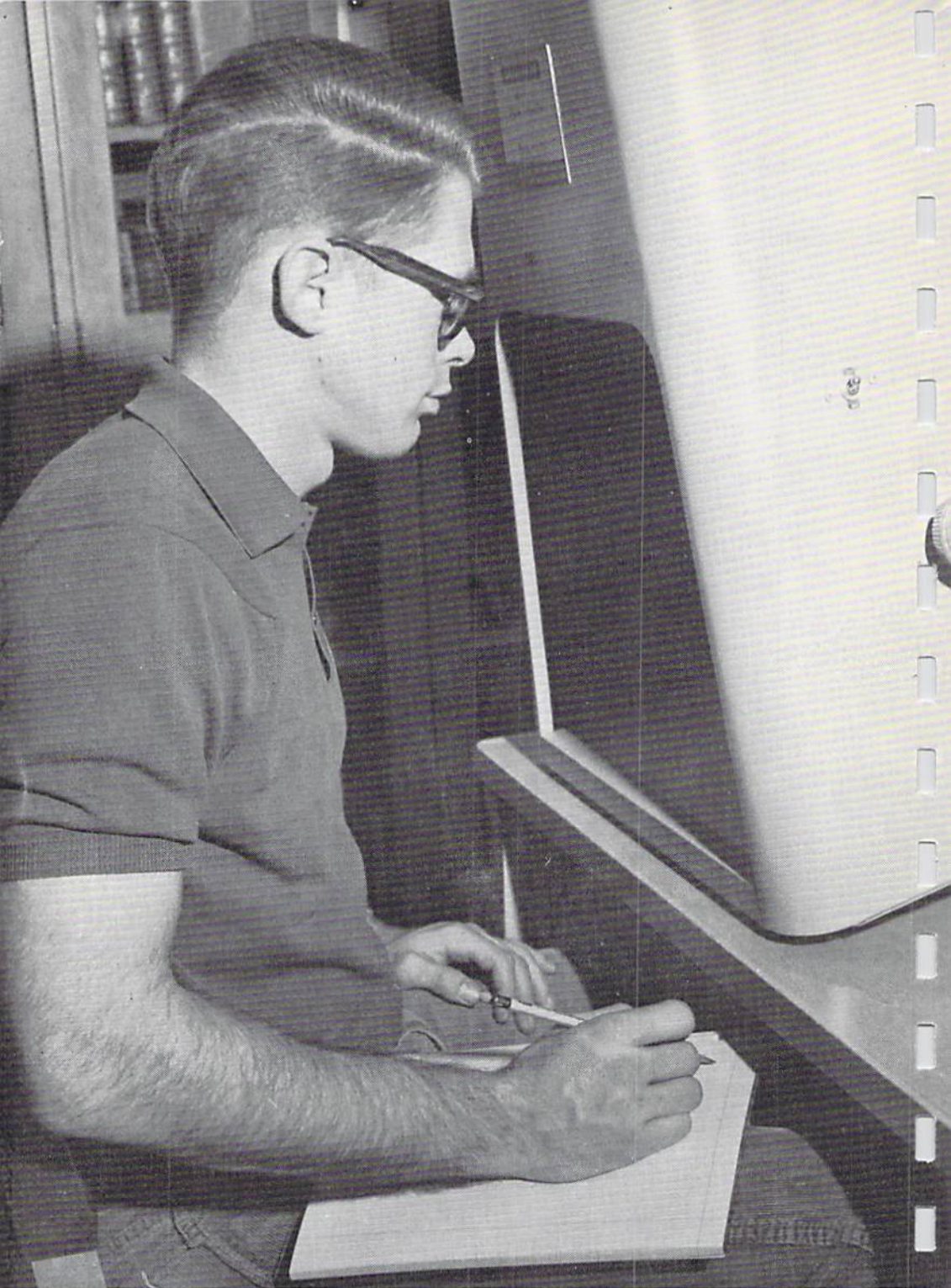
1. Complete the following general requirements:

Acc. 215-216—Principles of Accounting	6
Econ. 121—Principles of Economics	3
Econ. 122 or P.S. 101	3
Engl. 101-102—Composition and Modes of Literature	6
Math. 110—Math of Finance	3
Sp. 211—Public Speaking	2
Soc. 101 or Psy. 101	3
2. Complete the following required courses in Office Administration:

O.A. 101-102—Shorthand (or approved electives)	6
O.A. 105—Intermediate Typewriting	2
O.A. 106—Advanced Typewriting	2
O.A. 201—Intermediate Stenography	3
O.A. 202—Advanced Stenography	3
O.A. 203—Office Machines	3
O.A. 208—Specialized Secretarial Skills	3
O.A. 231—Business Correspondence	3
Approved Electives	6
Total	60



Shh! Student announcer at work. University radio station KUAC-FM serves the community as well as being a laboratory for speech, radio and drama students.



One of the modern pieces of equipment in the library is this "microfilm reader."

College of Earth Sciences and Mineral Industry

EARL H. BEISTLINE—DEAN

The objectives of the College of Earth Sciences and Mineral Industry are: to prepare students for their place in the profession, community, state, nation and world; to carry on research and development work that will add to basic knowledge as well as assist in the discovery, recovery and utilization of mineral resources, and to provide more generalized instruction to students on campus and to interested persons in various communities in Alaska.

UNDERGRADUATE DEGREES—The College has programs that lead to Bachelor of Science Degrees in Geology, Geological Engineering, and Mining Engineering. A Bachelor of Arts Degree with a major in Geology may be earned.

GRADUATE DEGREES—Programs leading to a Master of Science Degree are offered in Geology, Mineral Industry Management, and Mineral Preparation Engineering.

The professional degree Mining Engineer (E.M.) may be earned by engineering graduates of the College.

The Department of Geology also offers a Ph.D. program.

MINERAL INDUSTRY RESEARCH LABORATORY—The 1963 Alaska State Legislature authorized the establishment of a mineral industry research program at the University of Alaska. The purpose of the Laboratory is to conduct appropriate applied and basic research in various areas of the mineral industry that will aid in the further utilization of Alaska's mineral resources. Research is conducted in facilities of the College and coordinated with graduate student academic programs.

EARTH SCIENCES AND MINERAL INDUSTRY AGENCY—Housed in the Brooks Memorial Mines Building with the College of Earth Sciences and Mineral Industry is the College Office of the Alaskan Geology Branch of the U. S. Geological Survey. This arrangement, leading to close association and cooperation and sharing of some facilities, tends to give harmony and efficiency to the work of all for the benefit of the mineral industries of Alaska.

GEOLOGY DEPARTMENT

ROBERT B. FORBES—DEPARTMENT HEAD

DEGREES—BACHELOR OF ARTS, BACHELOR OF SCIENCE,
MASTER OF SCIENCE AND Ph.D.

MINIMUM REQUIREMENTS FOR DEGREES—

B.A. GEOLOGY MAJOR—130 CREDITS

B.S. GEOLOGY—130 CREDITS, PLUS 8 CREDIT SUMMER FIELD COURSE

M.S. GEOLOGY—30 ADDITIONAL CREDITS, INCLUDING THESIS

B.S. GEOLOGICAL ENGINEERING—135 CREDITS PLUS 8 CREDIT SUMMER
FIELD COURSE

Ph.D. (OPEN)

The bachelors degree curricula in geology provides broad training in the earth sciences and essential course work in mathematics and the physical sciences. The geological engineering curriculum is designed to prepare the student for professional work in the earth sciences, involving engineering problems. Graduate programs are tailored to the special research and study interests of the student.

REQUIREMENTS AND CURRICULUM FOR A B.S. DEGREE IN GEOLOGY

FALL SEMESTER

FIRST YEAR 17 or 17½ CREDITS

Engl. 101—Comp. & Modes of Lit.	3
Math. 106—Algebra & Trig.	5
Geol. 101—General Geology	4
Chem. 101—General Chemistry	4
P.E. or Mil. Sci.	1 or 1½

SECOND YEAR 16 or 16½ CREDITS

Geol. 213—Mineralogy	5
Math. 201—Calculus	4
Phys. 103—College Physics	4
E. S. 101—Graphics	2
P. E. or Mil. Sci.	1 or 1½

THIRD YEAR 17 CREDITS

Geology elective	4
Geol. 321—Sedimentation	3
Geol. 401—Invertebrate Paleo	4
English elective	3
Social Science elective	3

SUMMER

Geol. 351—Field Geology, 8 credits, 8 weeks.

FOURTH YEAR 15 CREDITS

Foreign Language	5
Geol. 400—Earth Sci. Jour. Cl.	0
Approved electives	7
Social Science elective	3

SPRING SEMESTER

16 or 16½ CREDITS

Engl. 102—Comp. & Modes of Lit.	3
Math. 200—Calculus	4
Geol. 102—Historical Geology	4
Chem. 102—General Chemistry	4
P.E. or Mil. Sci.	1 or 1½

17 or 17½ CREDITS

Geol. 214—Petrology	5
Math. 202—Calculus	4
Phys. 104—College Physics	4
E. S. 102—Graphics	2
Min. 102A—Min. Systems Engr.	1
P. E. or Mil. Sci.	1 or 1½

16 CREDITS

Geology elective	4
Geol. 304—Geomorphology	3
Geol. 314—Structural Geol.	3
Geol. 402—Stratigraphy	3
Social Science elective	3

One year of a modern foreign language is required for graduation. Students who have completed two years of formal instruction in a modern foreign language at the high school level may petition to fulfill this requirement by taking a first year college reading examination in the language concerned.

Geol. 400—Earth Sciences Journal Club is required of all upper division geology and graduate students every semester.

For course descriptions, see page 129.

REQUIREMENTS AND CURRICULUM FOR A B.S. DEGREE IN GEOLOGICAL ENGINEERING

FALL SEMESTER

FIRST YEAR 18 or 18½ CREDITS

Engl. 101—Comp. & Modes of Lit.	3
Math. 106—Algebra & Trig.	5
Chem. 101—General Chemistry	4
E. S. 101—Graphics	2
E. S. 111—Engr. Science	3
P. E. or Mil. Sci.	1 or 1½

SECOND YEAR 16 or 16½ CREDITS

Math. 201—Calculus	4
Geol. 101—General Geology	4
Phys. 211—Gen. Physics	4
E. S. 207—Measurements	3
P. E. or Mil. Sci.	1 or 1½

SPRING SEMESTER

17 or 17½ CREDITS

Engl. 102—Comp. & Modes of Lit.	3
Math. 200—Calculus	4
Chem. 102—General Chemistry	4
E. S. 102—Graphics	2
E. S. 112—Engr. Science	3
P. E. or Mil. Sci.	1 or 1½

17 or 17½ CREDITS

Math. 202—Calculus	4
Geol. 102—Historical Geology	4
Phys. 212—Gen. Physics	4
E. S. 208—Mechanics	4
P. E. or Mil. Sci.	1 or 1½

THIRD YEAR		18 CREDITS		16 CREDITS
Econ. 121—Prin. of Economics	3		Chem. 212—Quantitative Anal.	4
E. S. 331—Mech. of Materials	3		Geol. 214—Petrology	5
English elective	3		Geol. 314—Structural Geol.	3
Geol. 213—Mineralogy	5		Min. 102—Min. Systems Engr.	4
Chem. 331—Physical Chem.	4			

SUMMER

Geol. 351—Field Geology, 8 credits, 8 weeks.

FOURTH YEAR		18 CREDITS		14 CREDITS
Geol. 401—Invertebrate Paleol.	4		Engl. elective	3
Min. Pr. 313—Mineral Prep.	3		Geol. 406—Ore Deposits	3
Geol. 415—Geol. and Engr. Prob.			Social Science electives	6
of Frozen Ground	3		Electives	1
Geol. 400—Earth Sci. Jour. Club	0		Geol. 400—Earth Sci. Jour. Club	0
Geol. 321—Sedimentation	3			
E. S. 341—Fluid Mechanics	4			

Geol. 400—Earth Science Journal Club is required of all upper division Geological Engineering majors.

For course description, see page 129.

REQUIREMENTS FOR A B.A. DEGREE WITH A GEOLOGY MAJOR

1. Complete the general requirements for a B.A. Degree listed on page 50.
2. Complete required courses in Geology as planned in individual conference with the Head of the Geology Department.

A minor in Geology requires 12-16 credits of approved Geology courses.

REQUIREMENTS FOR A M.S. DEGREE IN GEOLOGY

1. A minimum of 30 credits, including a maximum of 12 credits in Geol. 693-694, Special Topics, and Geol. 697-698, Thesis.
2. An examination to demonstrate ability to read geological literature in an approved foreign language.
3. Completion of the general requirements for a graduate degree listed on page 65.

REQUIREMENTS FOR A Ph.D.

1. Program arranged by conference.
2. Completion of the general requirements for a Ph.D. listed on page 53.

MINERAL ENGINEERING DEPARTMENT

DONALD J. COOK—DEPARTMENT HEAD

DEGREES—BACHELOR OF SCIENCE, ENGINEER OF MINES, AND MASTER OF SCIENCE

MINIMUM REQUIREMENTS FOR DEGREE: B.S.—140 CREDITS

M.S.—30 ADDITIONAL CREDITS

In the Mining Engineering curriculum, particular emphasis is placed upon engineering as it applies to the development and exploitation of mineral resources and upon the economics of the business of mining. In addition, a student interested in Petroleum Engineering may complete the first two years of the Mining Engineering curriculum and then transfer to another university and complete the final two years of the curriculum without loss of time.

UNDERGRADUATE DEGREES—The Department of Mineral Engineering offers the Bachelor of Science Degree in Mining Engineering.

GRADUATE DEGREES—The graduate program allows for the awarding of Master of Science Degrees in Mineral Industry Management and Mineral Preparation Engineering. The curriculums consist of core courses in Engineering Management with electives in the field of Mineral Industries and advanced courses in Mineral Preparation, respectively. University policy pertaining to graduate study leading to a Master's Degree applies.

The graduate program also provides for the awarding of a professional degree, Mining Engineer (E.M.). This degree may be conferred upon engineering graduates who present satisfactory evidence of continuous engagement in responsible engineering work for not less than five years and a satisfactory thesis.

REQUIREMENTS AND CURRICULUM FOR A B.S. DEGREE IN MINING ENGINEERING

FALL SEMESTER

FIRST YEAR 18 or 18½ CREDITS

Engl. 101—Comp. & Modes of Lit.	3
Math. 106—Algebra & Trig.	5
E.S. 101—Graphics	2
E.S. 111—Engineering Science	3
Geol. 101—General Geology	4
P.E. or Mil. Sci.	1 or 1½

SPRING SEMESTER

17 or 17½ CREDITS

Engl. 102—Comp. & Modes of Lit.	3
Math. 200—Calculus	4
E.S. 102—Graphics	2
E.S. 112—Engineering Science	3
*Min. 102—Min. Systems Engr.	4
P.E. or Mil. Sci.	1 or 1½

*Course may be taken in increments, see course descriptions.

SECOND YEAR

17 or 17½ CREDITS

Math. 201—The Calculus	4
Phys. 211—General Physics	4
Geol. 213—Mineralogy	4
Chem. 201—Gen. & Quant. Chem.	4
P.E. or Mil. Sci.	1 or 1½

17 or 17½ CREDITS

Math. 202—The Calculus	4
Phys. 212—General Physics	4
E.S. 208—Mechanics	4
Chem. 202—Gen. & Quant. Chem.	4
P.E. or Mil. Sci.	1 or 1½

THIRD YEAR

18 CREDITS

Chem. 331—Phys. Chem.	4
Engl. elective (Lit. recomm.)	3
E.S. 313—Mechanics of Materials	3
E.S. 341—Fluid Mechanics	4
Min. 303—Min. Plant Engr.	4

18 CREDITS

Met. 304—Intro. to Met.	3
Min. 306—Rock Mechanics	3
Econ. 121—Prin. of Economics	3
Geol. 314—Structural Geol.	3
Min. 301—Mine Surveying	3
English elective	3

FOURTH YEAR

18 CREDITS

Min. 405—Geophys. and Geochem.	3
*B.A. 363—Production Mngt.	3
E.E. 313—Elem. Elec. Engr.	3
Math. elective	3
Min. Pr. 313—Intro. to Min. Prep.	3
Social Science elective	3

16 CREDITS

Min. 496—Min. or Mineral Res.	3
*Geol. 406—Ore Deposits	3
E.E. 314—Elem. Elec. Engr.	3
Min. 408—Mineral Val. & Econ.	4
Social Science elective	3

*Approved electives may be substituted.

The above program may be taken over a five-year period if a chemistry sequence of Chem. 101, 102, and 212 is followed and the student desires more time for electives of his choice.

For course descriptions, see page 141.

PETROLEUM ENGINEERING—Because of recent developments in the petroleum industry in Alaska, the Board of Regents has approved the initiation of a two-year basic program in Petroleum Engineering at the University of Alaska. Students enrolling in Petroleum Engineering will normally complete the first two years of basic engineering study listed in the mining engineering curriculum. This course of study may be altered to allow for specific requirements of individuals. Upon satisfactory completion of the two-year curriculum, students may transfer to one of a number of universities having petroleum engineering programs and complete their course of study without loss of time or course credit.

REQUIREMENTS FOR A M.S. DEGREE IN MINERAL INDUSTRY MANAGEMENT

Completion of the program listed below:

FALL SEMESTER

15 CREDITS

E.M. 611—Engr. Management	3
EM. 605—Adv. Engr. Economy	3
Min. 697—Thesis	3
Approved elective	3
Min. 621 Adv. Mineral Economics	3

SPRING SEMESTER

15 CREDITS

E.M. 612—Engr. Management	3
E.M. 613—Engr. Management	3
Min. 698—Thesis	3
Approved elective	6

Completion of the general requirements for a graduate degree as listed on page 51.

REQUIREMENTS FOR A M.S. DEGREE IN MINERAL PREPARATION ENGINEERING

Completion of the program listed below:

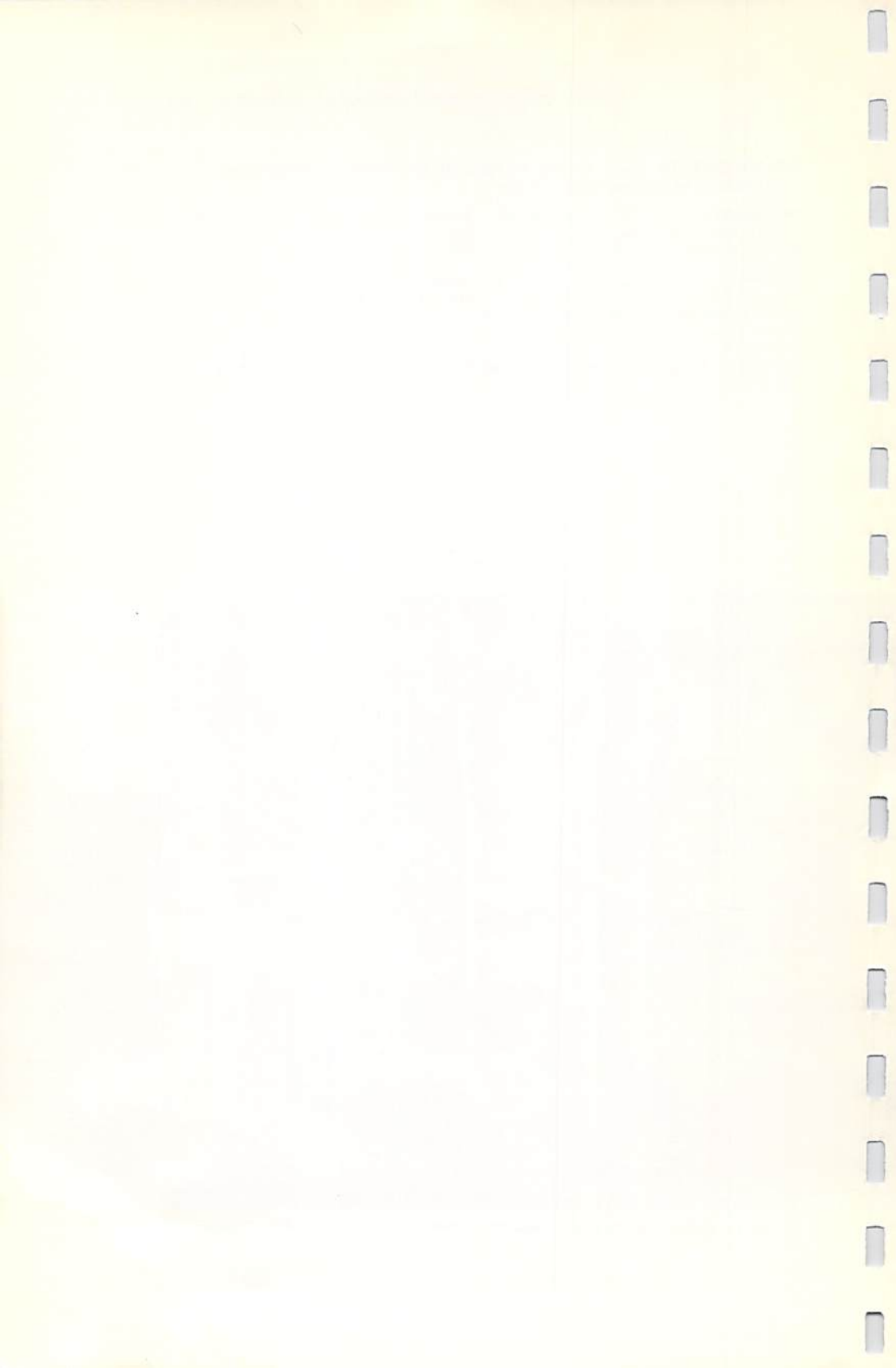
FALL SEMESTER	15 CREDITS	SPRING SEMESTER	15 CREDITS
Min. Pr. 601—Froth Flotation	3	Min. Pr. 696—Min. Prep. Res.	3
Min. Pr. 695—Min. Prep. Res.	3	Min. Pr. 606—Plant Design	3
Min. 621—Adv. Mineral Economy	3		
*Elective	3	*Elective	6
Min. Pr. 697—Thesis	3	Min. Pr. 698—Thesis	3

Completion of the general requirements for a graduate degree as listed on page 51.

*Electives will be in the field of chemistry, physics and mathematics and will be chosen to broaden the candidate's fundamental knowledge, depending upon his specific background and interest.



Students enjoy the "scramble system" cafeteria in the University Commons.



College of Mathematics, Physical Sciences and Engineering

CHARLES SARGENT—DEAN

Physical Science is based upon mathematical fundamentals, Engineering is founded upon mathematical and physical principles. The integration of the departments of this College provides the common ground for training in science and technology.

The primary mission of the College is to provide education to the baccalaureate level in its departments and to supplement the primary purpose with research and graduate training where necessary.

UNDERGRADUATE DEGREES—The College grants the following undergraduate degrees: Bachelor of Arts, Bachelor of Science, and Bachelor of Engineering (Chemical, Civil, Electrical, Mechanical).

GRADUATE DEGREES—The college offers the following graduate degrees: Master of Arts, Master of Science, and Doctor of Philosophy.

DEPARTMENTS—Departments in the College include: Chemistry and Chemical Engineering, Civil Engineering, Electrical Engineering, Engineering Management, Mathematics, Mechanical Engineering, and Physics.

ENGINEERING SCIENCE COURSES—The designation Engineering Science is given to courses which are common to all fields of Engineering. Each engineering curriculum specifies which of these courses are required and the semester in which it is advisable to take them.

FIRST-YEAR ENGINEERING STUDENTS—All first-year students intending to study engineering will be registered in Engineering Science. Before a student may be registered in a particular specialty of engineering, he must have an accumulated average of 2.00 and have completed all courses listed in the curriculum for the common first year of Engineering Science.

CHEMISTRY DEPARTMENT

GEORGE DAHLGREN—DEPARTMENT HEAD

DEGREES—BACHELOR OF ARTS, BACHELOR OF SCIENCE, MASTER OF ARTS,
MASTER OF SCIENCE

MINIMUM REQUIREMENTS FOR DEGREE: B.A., B.S.—130 CREDITS

M.A., M.S.—30 ADDITIONAL CREDITS

Graduates in chemistry qualify in many fields: as teachers of chemistry, as supervisors in industry, as technical sales personnel; as research chemists in federal, state, municipal, academic or industrial laboratories, in premedicine or as laboratory technicians. The rapid introduction of chemical techniques in all branches of commerce and industry and the creation of the many synthetic products has caused phenomenal growth in the profession since World War I. Specific mention may be made of the manufacture of plastics, glass, pigments, starch, explosives, dyes, gases, petroleum products, fine and heavy chemicals, perfumes, drugs, vitamins, hormones, solvents, specialized fuels including nuclear fuels, and the various metals and alloys.

The curriculum in chemistry offers an opportunity for broad scientific study. All students specializing in chemistry will meet basic requirements in general inorganic, analytical, organic, and physical chemistry, as well as mathematics and physics. These may be supplemented by courses in biology, education, engineering, geophysics, geology, metallurgy and advanced courses in biology, chemistry, mathematics and physics, according to the interest of the individual student.

The general offerings of the Chemistry Department are arranged to allow students in less specialized programs to meet requirements for the requisite majors and minors. Such service courses and programs are an outstanding feature in the department.

The field of chemistry is highly developed. Graduate study is a necessity for the better opportunities in this field. A prospective chemist should elect additional courses in mathematics and physics. Sufficient study in two foreign languages, preferably German and French, to gain a reading knowledge is recommended.

REQUIREMENTS FOR A B.A. DEGREE WITH A MAJOR IN CHEMISTRY

1. Complete the general requirements for a B.A. Degree listed on page 50.
 2. Complete the following foundation courses:
Chem. 101 and 102—General Chemistry
or
Chem. 201 and 202—General and Quantitative Chemistry 8 credits
Math. 106 and 200 9
Phys. 103 and 104—College Physics
or
Phys. 211-212—Engineering Physics 8
 3. Complete 20 additional credits in Chemistry, including:
Chem. 212—Introductory Quantitative Chemistry 4
Chem. 223—Introductory Organic Chemistry
or
Chem. 321—Organic Chemistry 4
- A minor in Chemistry requires Chem. 101-2 or Chem. 201-2; Chem. 212, Chem. 223 or 321.

REQUIREMENTS AND CURRICULUM FOR A B.S. DEGREE WITH A MAJOR IN CHEMISTRY

FALL SEMESTER		SPRING SEMESTER	
FIRST YEAR	17 or 17½ CREDITS		16 or 16½ credits
Chem. 101—General Chem. & Intro.		Chem. 102—General Chem. and Intro.	
Qualitative Analysis	4	Qualitative Analysis	4
Math. 106—Algebra & Trig.	5	Math. 200—Calculus	4
Biol. 105—Fund. of Biology	4	Biol. 106—Fund. of Biology	4
Eng. 101—Comp. & Modes of Lit.	3	Eng. 102—Comp. & Modes of Lit.	3
P.E. or Mil. Sci.	1 or 1½	P.E. or Mil. Sci.	1 or 1½
SECOND YEAR	16 or 16½ CREDITS		17 or 17½ CREDITS
Chem. 321—Organic Chem.	4	Chem. 322—Organic Chem.	4
Phys. 211—General Physics		Phys. 212—Gen. Physics	
or		or	
Phys. 103—College Physics	4	Phys. 104—College Physics	4
Math. 201—Calculus	4	Math. 202—Calculus	4
Social Science Elective	3	Chem. 212—Intro. Quant. Anal.	4
P.E. or Mil. Sci.	1 or 1½	P.E. or Mil. Sci.	1 or 1½
THIRD YEAR	16 CREDITS		16 CREDITS
Chem. 331—Physical Chemistry	4	Chem. 332—Physical Chemistry	4
Math. or Science Elective	3	Math. or Science Elective	3
Social Science Elective	3	Social Science Elective	3
Elective	6	Elective	6
FOURTH YEAR	15 CREDITS		15 CREDITS
Chemistry Elective	4	Chemistry or Science Elective	4
English Elective	3	English Elective	3
Elective	8	Elective	8

A minor in Chemistry requires Chem. 101-2 or Chem. 201-2; Chem. 212, Chem. 223 or 321.

Chem. 201-202 may be taken instead of Chem. 101-102.

All electives must have the approval of the Head of the Department.

Students seeking a pre-professional chemistry major must complete one year of organic chemistry, organic qualitative analysis, one year of physical chemistry and one year of advanced chemistry.

E.S. 111-112 may be taken instead of Biol. 105-106.

Students who did not offer two years of a foreign language for admissions, must take one year of a foreign language, preferably German.

REQUIREMENTS FOR A M.A. OR M.S. DEGREE IN CHEMISTRY

1. A minimum of 30 credits of approved courses, including Chemistry 697, Thesis.
 2. Completion of the general graduate degree requirements listed on page 51.
- Graduate students seeking a Master's Degree with a major in chemistry must develop a program in one of the four general divisions of chemistry: analytical, inorganic, organic or physical. A student entering without preparation to take these courses may require additional time to earn his degree.

For course descriptions, see page 115.

CHEMICAL ENGINEERING DEPARTMENT

GEORGE DAHLGREN—DEPARTMENT HEAD

DEGREES—BACHELOR OF SCIENCE (ENGINEERING SCIENCE) AND
BACHELOR OF ENGINEERING (CHEMICAL)

MINIMUM REQUIREMENTS FOR DEGREE: B.S.—130 CREDITS

B.E.—162 CREDITS

Chemical Engineering is concerned with the development and application of manufacturing processes in which physical or chemical changes of materials are involved. The chemical engineer is primarily concerned with the development, design, and operation of equipment and processes for bringing about those desired changes on an industrial scale and at a profit. Chemical engineers find opportunities with manufacturers of all the numerous chemical products of commerce such as the heavy and fine chemicals, pulp and paper, plastics, drugs, dyes, soap, and mineral products; with the atomic energy, missile and satellite programs; with petroleum refineries; with the mineral industry; with the food industries and with many other industries. These opportunities may involve research, design, control, operation and technical sales.

The curriculum provides a good foundation in basic chemical engineering and chemistry with a broad knowledge of general engineering. It provides an adequate foundation for graduate work or for entering specialized fields.

REQUIREMENTS AND CURRICULUM FOR A B.S. DEGREE (ENGINEERING SCIENCE) WITH A MAJOR IN CHEMICAL ENGINEERING

FALL SEMESTER

FIRST YEAR	17½ CREDITS
Engl. 101—Comp. & Modes of Lit.	3
Math. 106—Algebra & Trig.	5
E.S. 101—Graphics	2
E.S. 111—Engr. Science	3
Econ. 121—Prin. of Econ.	3
M.S. 101—Mil. Sci.	1½

SECOND YEAR	16½ CREDITS
Math. 201—Calculus	4
Phys. 211—Gen. Physics	4
E.S. 207—Measurements	3
Chem. 201—Gen. Chem. & Quant. Chem. 4	
M.S. 201—Mil. Sci.	1½

THIRD YEAR	17 CREDITS
E.S. 331—Mech. of Materials	3
Math. 302—Differential Equations	3
Chem. 321—Organic Chem.	4
Chem. 331—Physical Chemistry	4
E.E. 313—Elements of Elect. Engr.	3

FOURTH YEAR	14 CREDITS
E.S. 341—Fluid Mechanics	4
C.E. 441—Sanitary Engr.	3
Ch.E. 477—Unit Operations	3
Ch.E. 479—Unit Operations Lab.	1
Humanities or Social Science	3

SPRING SEMESTER

16½ CREDITS	
Engl. 102—Comp. & Modes of Lit.	3
Math. 200—Calculus	4
E.S. 102—Graphics	2
E.S. 112—Engr. Science	3
Soc. Sci. or Humanities	3
Mil. Sci.	1½

17½ CREDITS	
Math. 202—Calculus	4
Phys. 212—Gen. Physics	4
E.S. 208—Mechanics	4
Chem. 202—Gen. Chem. & Quant. Chem.	4
M.S. 202—Mil. Sci.	1½

17 CREDITS	
C.E. 334—Phys. Prop. of Mat.	3
Chem. 322—Organic Chem.	4
Chem. 332—Physical Chemistry	4
E.E. 314—Elements of Elect. Engr.	3
Math. 310—Numerical Analysis	3

15 CREDITS	
E.S. 450—Engr. Mgt. & Oper.	3
E.S. 491—Engr. Seminar	3
Ch.E. 486—Chem. Engr. Thermo.	3
Engl. 213—Advanced Exposition	3
Chem. or Engr. Elective	3

REQUIREMENTS FOR A B.E. DEGREE (CHEMICAL)

1. Complete four-year program for B.S. Degree
2. Complete the following program of courses:

FIFTH YEAR	16 CREDITS		16 CREDITS
Math. 611—Math. of Phys. & Engr.	3	Math. 612—Math. of Phys. & Engr.	3
Ch.E. 433—Applied Chem. Kinetics	3	Ch.E. 488—Unit Operations	3
Ch.E. 487—Adv. Unit Operations	3	Ch.E. 490—Unit Operations Lab.	2
Ch.E. 493—Special Topics	1	Ch.E. 494—Special Topics	2
Engineering Elective	3	Engineering Elective	3
Approved Elec. in Chem., Physics, Engineering or Metallurgy	3	Approved Elec. in Chem., Physics, Engineering or Metallurgy	3

For course descriptions see page 114.

CIVIL ENGINEERING DEPARTMENT

E. F. RICE—DEPARTMENT HEAD

BACHELOR OF SCIENCE (ENGINEERING SCIENCE)

MASTER OF CIVIL ENGINEERING AND MASTER OF SCIENCE

MINIMUM REQUIREMENTS FOR DEGREES: B.S.—130 CREDITS

M.S.—30 ADDITIONAL CREDITS

M.C.E.—162 CREDITS

Engineering embraces the wide range of cultural and professional subjects having to do with the planning, design, and construction of works necessary for civilization. Civil Engineering in particular deals with environmental control; bridges, buildings, dams, and harbor facilities; water resource development, and waste disposal; water power, irrigation works, and drainage; air, water, highway and railway transportation; construction and management; topographic surveying and geodesy; city management and developmental planning.

Candidates for the Bachelor of Science degree will pass a comprehensive examination in their general field.

Students will enter the fifth year in one of two programs: those whose goal is broad professional practice will ordinarily choose the curriculum leading to the degree Master of Civil Engineering; those whose interests or background favor a highly specialized program, with emphasis on research and/or advanced specialized study, will ordinarily select the degree Master of Science in Civil Engineering.

The first four years are common to each of these programs.

REQUIREMENTS AND CURRICULUM FOR A B.S. DEGREE (ENGINEERING SCIENCE) WITH A MAJOR IN CIVIL ENGINEERING

FALL SEMESTER		FIRST YEAR	17½ CREDITS	SPRING SEMESTER		FIRST YEAR	16½ CREDITS
Engr. 101—Comp. & Modes of Lit.	3	Engr. 101—Comp. & Modes of Lit.	3	Engr. 102—Comp. & Modes of Lit.	3		
Math. 106—Alge. & Trig.	5	Math. 106—Alge. & Trig.	5	Math. 200—Calculus	4		
E.S. 101—Graphics	2	E.S. 101—Graphics	2	E.S. 102—Graphics	2		
E.S. 111—Engineering Science	3	E.S. 111—Engineering Science	3	E.S. 112—Engineering Science	3		
Econ. 121—Principles of Econ.	3	Econ. 121—Principles of Econ.	3	Soc. Sci. or Humanities	3		
M.S. 101—Mil. Sci.	1½	M.S. 101—Mil. Sci.	1½	M.S. 102—Mil. Sci.	1½		
SECOND YEAR		SECOND YEAR	16½ CREDITS	SECOND YEAR		SECOND YEAR	17½ CREDITS
Math. 201—Calculus 1	4	Math. 201—Calculus 1	4	Math. 202—Calculus	4		
Phys. 211—Gen. Physics	4	Phys. 211—Gen. Physics	4	Phys. 212—Gen. Physics	4		
E.S. 207—Measurements	3	E.S. 207—Measurements	3	E.S. 208—Mechanics	4		
Chem. 201—Gen. & Quant. Chem.	4	Chem. 201—Gen. & Quant. Chem.	4	Chem. 202—Gen. & Quant. Chem.	4		
M.S. 201—Mil. Sci.	1½	M.S. 201—Mil. Sci.	1½	M.S. 202—Mil. Sci.	1½		
THIRD YEAR		THIRD YEAR	17 CREDITS	THIRD YEAR		THIRD YEAR	17 CREDITS
E.S. 331—Mech. of Materials	3	E.S. 331—Mech. of Materials	3	C.E. 334—Phys. Prop. of Materials	3		
Math. 302—Differential Equations	3	Math. 302—Differential Equations	3	E.S. 346—Basic Thermodynamics	3		
E.S. 341—Fluid Mechanics	4	E.S. 341—Fluid Mechanics	4	E.E. 314—Elem. of Elect. Engr.	3		
E.E. 313—Elem. of Elect. Engr.	3	E.E. 313—Elem. of Elect. Engr.	3	Engr. 213—Advanced Exposition	3		
Geol. 101—General Geology	4	Geol. 101—General Geology	4	C.E. 344—Hydrology	2		
				Math. 312—Numerical Methods for Engineers	3		

FOURTH YEAR		15 CREDITS			14 CREDITS
C.E. 435—Soil Mechanics	3		E.S. 450—Engr. Mgt. & Oper.	3	
C.E. 441—Sanitary Engineering	3		C.E. 432—Structural Design	4	
C.E. 431—Structural Analysis	4		C.E. 402—Transportation Engr.	2	
C.E. 415—Surveying	3		C.E. 422—Foundation Engineering	3	
Sp. 211—Public Speaking	2		Soc. Sci. or Humanities	3	

REQUIREMENTS FOR A M.C.E. DEGREE

Each fifth-year student under this program shall be guided by a personal advisor and shall accumulate 32 semester hours of approved courses.

REQUIREMENTS FOR THE M.S. DEGREE IN CIVIL ENGINEERING

A student selecting this program or the program for Master of Science (Engineering Management) will meet the general requirements for the Master's degree (page 51) plus the following:

32 semester hours of credit approved by his graduate committee, of which 6 to 12 semester hours will be C.E. 697, 698, Thesis.

ELECTRICAL ENGINEERING DEPARTMENT

JOHN G. TRYON—DEPARTMENT HEAD

DEGREES—BACHELOR OF SCIENCE (ENGINEERING SCIENCE) AND MASTER OF ELECTRICAL ENGINEERING

MINIMUM REQUIREMENTS FOR DEGREES: B.S.—130 CREDITS

Electrical Engineering treats of the useful applications of electricity and magnetism. Electrical engineers develop, design, and operate equipment for generating and utilizing power, for communication, for automatic control, and for information processing.

The program emphasizes the study of electronic devices and circuits, with particular reference to communication. Due attention is given to power, control, and information processing. A student who completes the M.E.E. is ready to work in industry or continue with graduate study.

In recognition of readiness for professional responsibility the Master of Engineering is accredited by the Engineers' Council for Professional Development.

The curriculum of the Bachelor of Science (Engineering Science) is preparation for graduate study. It is not a complete program for professional responsibilities and the B.S. (E.S.) is not accredited by the E.C.P.D.

REQUIREMENTS AND CURRICULUM FOR A B.S.E.S. DEGREE (DEGREE (ELECTRICAL))

FALL SEMESTER

FIRST YEAR		17 or 17½ CREDITS
Engl. 101—Comp. & Modes of Lit.	3	
Math. 106—Algebra & Trig.	5	
E.S. 101—Graphics	2	
E.S. 111—Engineering Science	3	
Econ. 121—Prin. of Econ.	3	
P.E. or Mil. Sci.	1 or 1½	

SECOND YEAR		16 or 16½ CREDITS
Math. 201—Calculus	4	
Phys. 211—Gen. Physics	4	
E.E. 203—Fund. of Elect. Engr.	4	
E.S. 207—Measurements	3	
P.E. or Mil. Sci.	1 or 1½	

THIRD YEAR		17 CREDITS
Math. 302—Diff. Equations	3	
Chem. 201—Gen. & Quant. Chem.	4	
E.S. 331—Mechanics of Materials	3	
*E.E. 333—Electronics	4	
English Elective	3	

FOURTH YEAR		15 or 16 CREDITS
E.S. 341—Fluid Mechanics	4	
*E.E. 403—Machines & Power	4	
E.E. 453—Circuit Theory		
or		
Phys. 331—Elect. & Magnetism	3 or 4	
Soc. Sci. or Humanities	3	
Elective	0 or 1 or 2	

SPRING SEMESTER

		16 or 16½ CREDITS
Engl. 102—Comp. & Modes of Lit.	3	
Math. 200—Calculus	4	
E.S. 102—Graphics	2	
E.S. 112—Engineering Science	3	
Soc. Sci. or Humanities	3	
P.E. or Mil. Sci.	1 or 1½	

		17 or 17½ CREDITS
Math. 202—Calculus	4	
Phys. 212—Gen. Physics	4	
E.E. 204—Fund. of Elect. Engr.	4	
E.S. 208—Mechanics	4	
P.E. or Mil. Sci.	1 or 1½	

		16 CREDITS
Math. 312—Numerical Methods	3	
Chem. 202—Gen. & Quant. Chem.	4	
Engl. 213—Advanced Exposition	3	
*E.E. 334—Electronics	4	
Elective	2	

		15 or 16 CREDITS
E.S. 346—Basic Thermodynamics	3	
*E.E. 404—Machines & Power	4	
E.E. 454—Circuit Theory		
or		
E.E. 432—Fields, Lines, Antennas	4	
E.S. 492—Engr. Seminar	3	
Electives	1 or 2	

Electives must have the approval of the department.

*Interchange of upper division courses that are not normally offered every year will be made by the department.

REQUIREMENTS FOR THE MASTER OF ELECTRICAL ENGINEERING

Each student will be guided by a committee, and should expect to:

1. Have met all requirements for the B.S. in Engineering Science with major in electrical engineering.
2. Meet all university requirements for the masters.
3. Take a total of 32 credits including EE 453-4, Circuit Theory, EE 471 Control, EE 462 Communication Systems, and ES 450 Engineering Management.
4. Do a project.

ENGINEERING MANAGEMENT

JOHN HILPERT—DEPARTMENT HEAD

DEGREE—MASTER OF SCIENCE

MINIMUM REQUIREMENTS FOR DEGREE—30 CREDITS (beyond a Bachelor's degree in one of the recognized branches of Engineering).

The Engineering Management curriculum is designed for graduate engineers who will hold executive or managerial positions in engineering, construction, or industrial organizations. It includes financial, legal, human relations, economic, and technical subjects which are useful to solve problems of management.

The curriculum will include graduate level core courses, business law, and additional course work either directed toward special problems such as Arctic Engineering, or work in one of the more general fields of engineering through projects or research in the application of engineering management principles.

FALL SEMESTER	15 CREDITS	SPRING SEMESTER	15 CREDITS
B.A. 331—Business Law	3	B.A. 332—Business Law	3
E.M. 611—Engineering Mgt.	3	E.M. 612—Engineering Mgt.	3
E.M. 605—Adv. Engr. Economy	3	E.M. 613—Engineering Mgt.	3
Electives	6	Project or Research	3
		Elective	3

Other courses may be substituted for Business Law if a student shows evidence of satisfactory completion of subject matter of B.A. 331 and 332 at the B grade level.

For course descriptions, see page 125.

Electives must have the approval of the department.

GENERAL SCIENCE CURRICULUM

WILLIAM S. WILSON—DEPARTMENT HEAD

DEGREES—BACHELOR OF SCIENCE AND MASTER OF SCIENCE

MINIMUM REQUIREMENTS FOR DEGREES: B.S.—130 CREDITS

M.S.—30 ADDITIONAL CREDITS

Man's insatiable curiosity and his desire to understand the world about him has led him to the study of natural science and to the scientific method. Progress in this study has been fruitful and is so rapid now that the new discoveries in science are affecting our everyday lives, and most certainly will continue to do so in our lifetime. Consequently, every educated citizen needs a knowledge and appreciation of the philosophy and structure of science. It is generally agreed that the best method for achieving this is by direct study of a natural science, and all the curricula at the University of Alaska reflect this fact in their requirements.

Traditionally, the role of mathematics has been to simplify, interpret, and extend the boundaries of science. The fact that mathematics still includes, as well as transcends, this function makes it a necessary study.

The major in General Science has been designed, as its name indicates, to provide an opportunity to become familiar with a considerable number of natural sciences and thus provide a firm background for specialization in any one of them as well as in certain technical professions. The fields lying on the border between the older sciences provide excellent opportunity for research. An acquaintance with the fundamentals of all of the natural sciences is of value in teaching science in high school and college and also in preparing for specialization in certain of the social sciences.

**REQUIREMENTS AND CURRICULUM FOR A B.S. DEGREE WITH
A MAJOR IN GENERAL SCIENCE**

FALL SEMESTER

FIRST YEAR 16 or 16½ CREDITS

Engl. 101—Comp. & Modes of Lit.	3
Biol. 105—Fund. of Biology	4
Math. 106—Algebra & Trig.	5
Chem. 101—General Chem.	
or	
Phys. 103—Coll. Physics	4
P.E. or Mil. Sci.	1 or 1½

SPRING SEMESTER

16 or 16½ CREDITS

Engl. 102—Comp. & Modes of Lit.	3
Biol. 106—Fund. of Biology	4
Math. 200—Calculus	4
Chem. 102—General Chem.	
or	
Phys. 104—Coll. Physics	4
P.E. or Mil. Sci.	1 or 1½

SECOND YEAR 17 to 18½ CREDITS

Econ. 121—Prin. of Economics	3
Phys. 103—Coll. Physics	
Chem. 101—General Chem.	4
Geol. 101—Gen. Geology	4
For. Lang. or Dept. Elec.	6 or 5
P.E. or Mil. Sci.	1 or 1½

17 to 18½ CREDITS

Phys. 104—Coll. Physics	
or	
Chem. 102—General Chem.	4
Anth. 101—The Study of Man	3
For. Lang. or Dept. Elec.	7 or 6
Elective	
P.E. or Mil. Sci.	1 or 1½

THIRD AND FOURTH YEARS

By the beginning of his junior year each student in General Science must decide upon his major field and, with the assistance of the person in charge of administering the curriculum in General Science, make out a program for his third and fourth years of study.

Directions for making out the program:

1. Include the following courses:
Dept. Elec. or For. Lang. 5
Engl. 213—Adv. Exposition or
selected literature 3
Social Science Elective 3
Dept. Elec. or For. Lang. 5
Engl. 314—Scholarly and Tech. 3
Writing or selected literature 3
2. The major field must comprise a minimum of 20 credits above the foundation courses included in this curriculum. The courses scheduled must be approved in writing by the head of the major department. A major may be elected in Anthropology, Biological Science (Zoology or Botany), Chemistry, Geology, Geophysics, Mathematics, or Physics.
3. The electives must include either two minors of at least 12 credits each above the foundation courses included in this curriculum, or a second major. Minors may be selected in any of the major departments listed or in the fields of Economics, Education (minimum 16 credits), English, French, German, Russian, History, or Political Science.
4. All prerequisites of courses elected must be met, preferably by inclusion in the major.
5. One year of German, French, or Russian is required in the General Science curriculum. If the foreign language is postponed to the third year, the program described under Third and Fourth Year must be made out at the beginning of the Second Year.
6. Advanced Exposition is required unless written work in all courses indicates a good writing technique.
7. Courses selected to complete the requirement in the social sciences must be chosen from the following: Anth. 212, 321, 324, 325, 331, 342, 423; Soc. 101, 102; any History; any Political Science.

REQUIREMENTS FOR A M.S. DEGREE IN GENERAL SCIENCE

1. A minimum of 30 credits of approved courses.
2. Completion of the General graduate degree requirements listed on page 51.

The Department of Mathematics, Physics, Chemistry, Biology, and Geology offer work toward the degree of Master of Science with a major in General Science. This degree may be described as a "breadth" rather than "depth" degree, and a candidate is ordinarily pursuing a course of study in which one of these departments is cooperating with at least one other department within the university. A prospective candidate must meet the general requirements for admission and for the awarding of the degree. At least 21 credits must be earned in science and mathematics. At least 12 credits must be earned in the department giving the degree. A thesis (maximum of three credits) or project (no credit) must be completed in the major department. It is not intended that the individual courses merely satisfy the credit requirements, but each course should contribute to the specific aim of the candidate, and the thesis or project should reflect this aim.

MATHEMATICS DEPARTMENT

RUSSELL E. CARR—DEPARTMENT HEAD

DEGREES—BACHELOR OF ARTS, BACHELOR OF SCIENCE, AND MASTER OF SCIENCE

MINIMUM REQUIREMENTS FOR DEGREES: B.A.—130 CREDITS

B.S.—130 CREDITS

M.S.—30 ADDITIONAL CREDITS

The Department of Mathematics offers service courses to all the colleges of the University. In addition, the Department offers courses for students who major in mathematics. The number of positions available for trained mathematicians grows annually, and currently exceeds the supply.

A digital computer, installed in October, 1961, has improved the department's capacity to train mathematicians, scientists, and engineers.

In addition to meeting all the general requirements for the specific degree, certain mathematics courses are required of all mathematics majors. All electives must be approved by the Mathematics Department. Students preparing to teach mathematics in secondary schools must take the education courses necessary to obtain an Alaska Teaching Certificate.

REQUIREMENTS FOR THE BACHELOR'S DEGREE WITH A MAJOR IN MATHEMATICS

Complete the following courses beyond Math. 202:

Math. 302—Differential Equations	3 credits
Math. 303—Introduction to Modern Algebra	3
Math. 314—Linear Algebra	3
Math. 371—Probability	3
Math. 401—Advanced Calculus	3
Math. 402—Advanced Calculus	3
Math 417—Differential Geometry	3

The B.A. degree requires completion of the above major requirements as well as the general requirements for the B.A. degree is listed on page 50.

A minor in Mathematics requires completion of Math. 200, Math. 201, Math. 202, and six additional credits in Mathematics at the 300 level or above.

REQUIREMENTS FOR THE BACHELOR'S DEGREE WITH A MAJOR IN MATHEMATICS

FALL SEMESTER

FIRST YEAR 17 or 17½ CREDITS

Engl. 101—Comp. & Modes of Lit.	3
E.S. 111—Engr. Sci.	3
*Math. 106—Algebra & Trig.	5
P.E. or Mil. Sci.	1 or 1½
Foreign Language	5

SECOND YEAR 16 or 16½ CREDITS

Math. 201—Calculus	4
Phys. 211—General Physics	4
Approved Electives	3
Chem. 201—Gen. Chem. & Quant. Chem.	4
P.E. or Mil. Sci.	1 or 1½

THIRD YEAR 17 CREDITS

Math. 302—Differential Equations	3
Math. 303—Intro. to Modern Alg.	3
Math. 371—Probability	3
English Elective	3
Approved Electives	5

FOURTH YEAR 17 CREDITS

Math. 401—Advanced Calculus	3
Social Sci. Electives	3
Approved Electives	11

*Math. 106 may be omitted if the student has adequate preparation.

SPRING SEMESTER

16 or 16½ CREDITS

Engl. 102—Comp. & Modes of Lit.	3
E.S. 112—Engr. Sci.	3
Math. 200—Calculus	4
P.E. or Mil. Sci.	1 or 1½
Foreign Language	5

16 or 16½ CREDITS

Math. 202—Calculus	4
Phys. 212—General Physics	4
Approved Electives	3
Chem. 202—Gen. Chem. & Quant. Chem.	4
P.E. or Mil. Sci.	1 or 1½

17 CREDITS

Math. 417—Differential Geometry	3
Math. 314—Linear Algebra	3
Social Sci. Elective	3
English Elective	3
Approved Electives	5

17 CREDITS

Math. 402—Advanced Calculus	3
Social Sci. Electives	3
Approved Electives	11

REQUIREMENTS FOR A M.S. DEGREE IN MATHEMATICS

1. A minimum of 30 credits of approved courses.
2. Satisfactory result of the final examination, including either the defense of a thesis if the candidate has elected to write one or a demonstration by other means by the candidate of proficiency at the graduate level in mathematics.
3. Completion of the general requirements for a graduate degree listed on page 51.

For course descriptions see page 137.

MECHANICAL ENGINEERING DEPARTMENT

E. F. RICE—DEPARTMENT HEAD

DEGREES—BACHELOR OF SCIENCE (ENGINEERING SCIENCE)

MASTER OF MECHANICAL ENGINEERING

MINIMUM REQUIREMENTS FOR DEGREES: B.S.—130 CREDITS

M.M.E.—162 CREDITS

Mechanical Engineering embraces professional disciplines concerned with the application of scientific principles to the design of mechanical equipment for the benefit of mankind. Emphasis is placed on the phases of Mechanical Engineering of special importance to Alaska; power, transportation, and environmental control.

Candidates for the Bachelor of Science degree will pass a comprehensive examination in their general field.

Students will enter the fifth year in one of two programs: those whose goal is broad professional practice will ordinarily choose the curriculum leading to the degree Master of Mechanical Engineering; those whose interests or background favor a highly specialized program with emphasis on research and/or advanced specialized study, will ordinarily select the degree Master of Science in Mechanical Engineering.

The first four years are common to each of these programs.

**REQUIREMENTS AND CURRICULUM FOR A B.S. DEGREE (ENGINEERING SCIENCE)
WITH A MAJOR IN MECHANICAL ENGINEERING**
FALL SEMESTER**FIRST YEAR 17½ CREDITS**

Engl. 101—Comp. & Modes of Lit.	3
Math. 106—Algebra & Trig.	5
E.S. 101—Graphics	2
E.S. 111—Engineering Science	3
Econ. 121—Prin. of Econ.	3
M.S. 101—Mil. Sci.	1½

SPRING SEMESTER**16½ CREDITS**

Engl. 102—Comp. & Modes of Lit.	3
Math. 200—Calculus	4
E.S. 102—Graphics	2
E.S. 112—Engineering Science	3
Social Science or Humanities	3
M.S. 102—Mil. Sci.	1½

SECOND YEAR**16½ CREDITS**

Math. 201—Calculus	4
Phys. 211—Gen. Physics	4
E.S. 207—Measurements	3
Chem. 201—Gen. & Quant. Chem.	4
M.S. 201—Mil. Sci.	1½

17½ CREDITS

Math. 202—Calculus	4
Phys. 212—Gen. Physics	4
E.S. 208—Mechanics	4
Chem. 202—Gen. & Quant. Chem.	4
M.S. 202—Mil. Sci.	1½

THIRD YEAR**16 CREDITS**

E.E. 313—Elem. of E.E.	3
Math. 302—Differential Equations	3
E.S. 331—Mech. of Materials	3
E.S. 341—Fluid Mechanics	4
M.E. 321—Industrial Processes	3

15 CREDITS

E.E. 314—Elem. of E.E.	3
Math. 312—Num. Methods	3
M.E. 302—Kinematics of Mach.	3
Engl. 213—Advanced Exposition	3
E.S. 346—Basic Thermodynamics	3

FOURTH YEAR**16 CREDITS**

M.E. 401—Machine Design	4
M.E. 413—M.E. Thermodynamics	3
M.E. 441—Introductory heat Transfer ...	3
Social Science or Humanities	3
Approved Technical Elective	3

16 CREDITS

M.E. 418—Power Analysis	4
M.E. 412—Space Conditioning	3
E.S. 450—Engr. Mgt. & Oper.	3
Met. 304—Intro. to Metallurgy	3
Approved Technical Elective	3

REQUIREMENTS FOR THE DEGREE OF MECHANICAL ENGINEERING

Each fifth year student under this program will be guided by a personal advisor and shall accumulate 32 semester hours of approved courses. M.E. students may alternatively enroll in Engineering Management under the requirements of that program.

PHYSICS DEPARTMENT

MANFRED H. REES—DEPARTMENT HEAD

DEGREES—BACHELOR OF ART, BACHELOR OF SCIENCE, MASTER OF SCIENCE, AND DOCTOR OF PHILOSOPHY

MINIMUM REQUIREMENTS FOR DEGREES: B.A.—130 CREDITS

B.S.—130 CREDITS

M.S.—30 ADDITIONAL CREDITS

Ph.D.—NO FIXED CREDITS

The science of physics is concerned with the nature of matter and energy and encompasses all phenomena in the physical world from elementary particles to the structure and origin of the universe. Physics provides, together with mathematics and chemistry, the foundation for work in all fields of physical science and engineering, and contributes to other fields such as biology, geology and marine science.

UNDERGRADUATE PROGRAM—The undergraduate curriculum aims at a good foundation in general physics with emphasis on the experimental aspects. It provides opportunities for careers in education and industry, and opens the door to advanced work in physics and related sciences.

GRADUATE PROGRAM—The graduate work is intimately connected with the research activities of the Geophysical Institute which offer ample thesis material in the fields of the atmospheric and space sciences and in solid earth physics. The research program of the Geophysical Institute currently emphasizes investigations of auroral and ionospheric physics, geomagnetism and earth currents, radio wave propagation and scattering, solar radio astronomy and solar-terrestrial relations, polar meteorology and glaciology, seismology and solid earth physics.

A graduate student may designate his major field as physics or geophysics. He will pursue his studies under the supervision of an Advisory Committee consisting of his major professor (chairman), two approved faculty members, and the department head (ex officio). The Committee advises on the course of study to be followed and determines the background courses (mathematics, physics, astronomy, chemistry, geophysics) necessary to support the major field.

The graduate course offerings include the basic material generally required for research and teaching in physics or related fields, and specialized courses in the research areas mentioned above.

REQUIREMENTS FOR A B.A. DEGREE WITH A MAJOR IN PHYSICS

1. Complete the general requirements for a B.A. Degree listed on page 50.
2. Complete the following foundation courses:
Phys. 103-104—College Physics 8 credits
3. Complete a minor in Mathematics, which includes Math. 200, 201, 202, and 6 credits at the 300 level or above.
4. Complete 20 credits of approved courses in Physics.

A minor in Physics requires 12-16 credits; or Physics 103, 104, 301 and 302.

REQUIREMENTS AND CURRICULUM FOR A B.S. DEGREE WITH A MAJOR IN PHYSICS

FALL SEMESTER

FIRST YEAR 15 or 15½ CREDITS

Engl. 101—Comp. & Modes of Lit.	3
Phys. 111—General Physics	3
Math. 106—Algebra and Trig.	5
P.E. or Mil. Sci.	1 or 1½
*Approved Electives	3

SECOND YEAR 16 or 16½ CREDITS

Math. 201—Calculus	4
Phys. 211—General Physics	4
Foreign Language	3 or 5
P.E. or Mil. Sci.	1 or 1½
*Approved Electives	4 or 2

THIRD YEAR 17 CREDITS

Math. 302—Differential Equations	3
Phys. 311—Classical Physics	4
Phys. 331—Electricity & Magnetism	3
*Approved Electives	5

SPRING SEMESTER

15 or 15½ CREDITS

Engl. 102—Comp. & Modes of Lit.	3
Phys. 112—General Physics	3
Math. 200—Calculus	4
P.E. or Mil. Sci.	1 or 1½
*Approved Electives	4

16 or 16½ CREDITS

Math. 202—Calculus	4
Phys. 212—General Physics	4
Foreign Language	3 or 5
P.E. or Mil. Sci.	1 or 1½
*Approved Electives	4 or 2

17 CREDITS

Math. 314—Linear Algebra	3
Phys. 312—Classical Physics	4
Phys. 332—Electricity & Magnetism	3
*Approved Electives	5

FOURTH YEAR		17 CREDITS			17 CREDITS
Math. 401—Advanced Calculus	3		Math. 402—Advanced Calculus	3	
Phys. 411—Modern Physics	4		Phys. 412—Modern Physics	4	
Phys. 481—Advanced Physics Lab.	2		Phys. 482—Advanced Physics Lab.	2	
*Approved Electives	8		Phys. 486—Experimental Physics		
			or		
			Phys. 494—Special Topics	3	
			*Approved Electives	5	

*9 credits of electives must be Social Science and 6 must be English.

REQUIREMENTS FOR A M.S. DEGREE IN PHYSICS OR GEOPHYSICS

1. A minimum of 30 credits of approved courses, including Phys. 697 or 698, Thesis.
2. Completion of the general requirements for a graduate degree listed on page 51.

REQUIREMENTS FOR A Ph.D. DEGREE IN PHYSICS OR GEOPHYSICS

1. Completion of the requirements for the doctoral degree set forth on page 53.
- For course descriptions, see page 147.

ELECTRONICS TECHNOLOGY PROGRAM

FOYLE L. GENTRY—DEPARTMENT HEAD

DEGREE—ASSOCIATE IN ELECTRONICS TECHNOLOGY

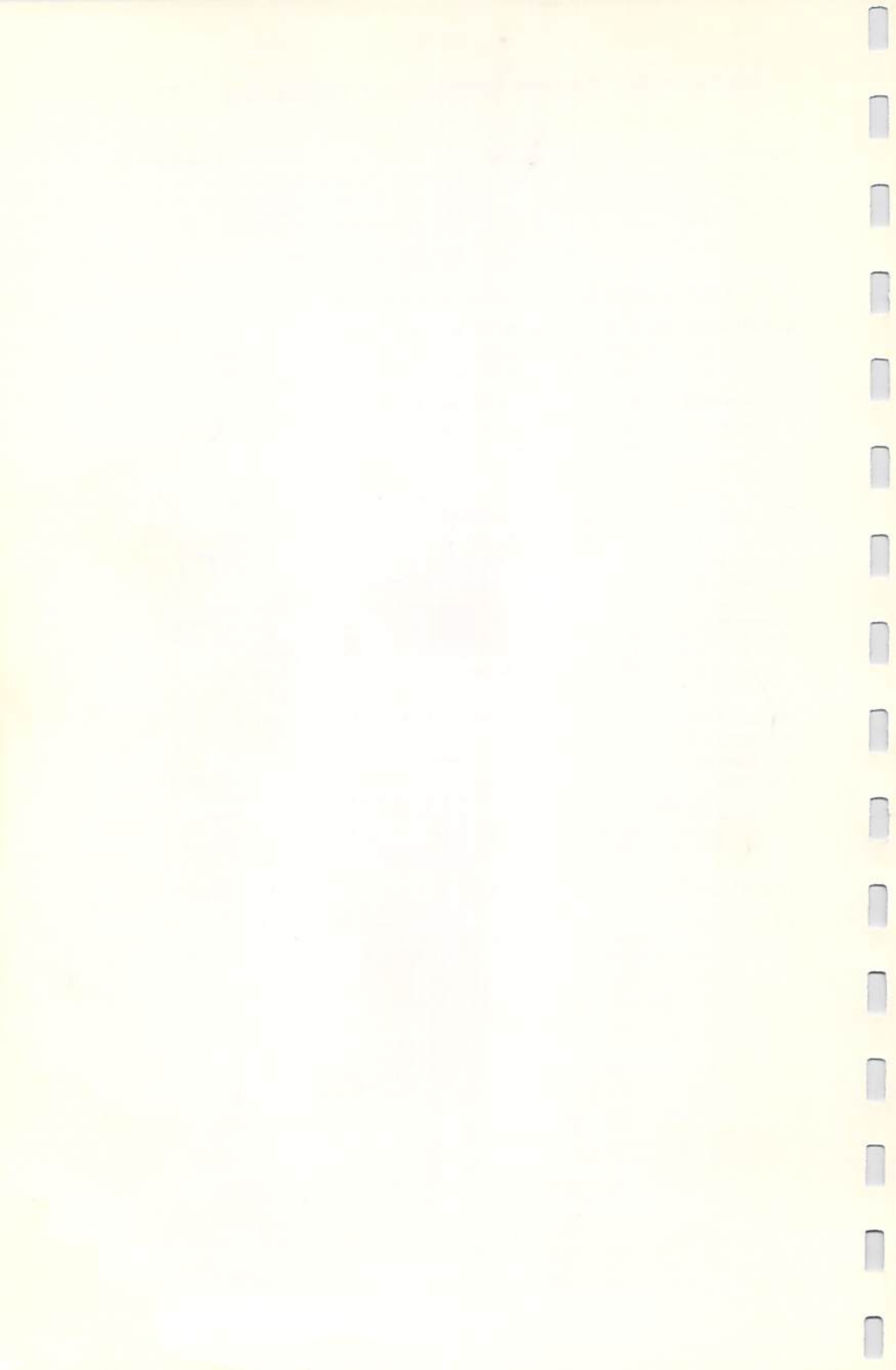
MINIMUM REQUIREMENTS FOR DEGREE: A.E.T.—65 CREDITS

The program in electronics technology prepares people to maintain, install, and operate complex electronic equipment, such as broadcast transmitters, airways beacons, carrier telephone systems, radars. The program is not introductory electrical engineering, which emphasizes design; it is electronics technology, which emphasizes maintenance.

Enrollment is limited. Write to the Department Head for information on admission to this program.

REQUIREMENTS AND CURRICULUM FOR AN ASSOCIATE DEGREE IN ELECTRONIC TECHNOLOGY

FALL SEMESTER		SPRING SEMESTER	
FIRST YEAR	16 CREDITS		17 CREDITS
E.T. 51—DC Circuits	4	E.T. 61—Tubes & Semiconductors	4
E.T. 52—AC Circuits	4	E.T. 62—Electronic Circuits I	3
E.T. 55—Electronics Practice I	3	E.T. 63—Electronic Systems I	4
E.T. 59—Math. for Electronics	5	E.T. 66—Electronics Practice II	3
		Engl. 68—Elementary Exposition	3
SECOND YEAR	17 CREDITS		16 CREDITS
E.T. 71—Electronic Circuits II	5	E.T. 83—Test Instruments	3
E.T. 72—Electronic Circuits III	4	E.T. 84—Electronic Systems II	5
E.T. 75—Microwave Electronics	4	B.A. 66—B.A. for Technicians	4
E.T. 77—System Maintenance	4	P.S. 68—Soc. Sci. for Tech.	4



Course Descriptions

Courses offered by the University are listed alphabetically by department.

COURSE NUMBERS—The first numeral of a course numbered in the hundreds indicates the year in which the course is normally offered in its own department. Odd numbers are assigned to courses given in the fall semester and even numbers to courses given in the spring semester. For example, English 101 is given for first-year students in the first or fall semester. English 342 is given for third-year students in the second or spring semester.

"1-49—Non-credit courses.

"50-99—Courses designed for associate degree or a technical certificate credit; they are not applicable to the baccalaureate requirements.

"300-499—Upper division courses. Freshmen and sophomores must petition the Academic Council for permission to take these groupings unless such courses are required in the first two years of their curriculum as printed in this catalog. ~~When marked with an asterisk (*321-492) such courses may be applied as graduate credit after approval by the head of the department offering the course and by the student's advisory committee.~~

"600-699—Graduate courses to which a few well qualified undergraduates may be admitted with the permission of the head of the department in which the course is offered.

"491-492 and 691-692 indicate Seminars, 493-494 and 693-694 indicate Special Topics, and 697-698 indicate Thesis or Dissertation in those departments where listed."

COURSE CREDITS—One credit (or one hour) represents satisfactory completion of one hour of work a week for one semester. This requirement may be met by attendance at one lecture, or by three fifty-minute periods of laboratory work a week, or the equivalent.

Following the title of each course, the figures in parenthesis indicate the number of lecture and laboratory hours the class meets, the first figure indicating lecture hours; the second, laboratory. For example (2+3) indicates that a class has 2 hours of lecture and 3 of laboratory work.

The number of credits listed is for each semester. Thus "Three Credits—Fall Semester" means three credits may be earned and the course is given in the fall or first semester.

COURSE CLASSIFICATIONS—Subjects and courses are classified as follows:

Natural Sciences
 Anthropology 302
 Biological Sciences
 Chemistry
 Geography 201, 401
 Geology
 Mathematics
 Physics

Social Sciences
 Anthropology
 Economics
 Geography
 History
 Home Economics 236, 301
 Law
 Political Science
 Psychology
 Sociology

Humanities
 Art
 English
 Foreign Language and Literature
 Journalism
 Linguistics
 Music
 Philosophy
 Speech and Drama

ACCOUNTING

Acc. 215 Accounting Principles (0+6)
 216

3 Credits Fall
 3 Credits Spring

Accounting as a factor in business management and control.

Fall semester: Accounting principles as they apply to the organization and conduct of business.

Spring semester: Application of accounting principles and practices to business situations; preparation of financial statements.

Prerequisite: Acc. 215—Sophomore standing or permission of the instructor. Acc. 216—Acc. 215 or equivalent.

Acc. 315 Intermediate Accounting (0+6)

3 Credits Fall

Advanced principles and techniques. Relation of accounting to business management and control; accounting practices and procedures designed to reflect the financial position of a business and the results of its operation. **Prerequisite** Acc. 216 or equivalent.

- Acc. 316 Analysis of Financial Statements (0+6)** 3 Credits Spring
Continuation of Acc. 315. Interpretation of financial statements and analysis of accounting data for business planning, investment and evaluation purposes. *Prerequisite:* Acc. 315 or equivalent.
- Acc. 318 Accounting Systems (0+6)** 3 Credits Spring
Function of commercially developed accounting systems; study and solution of procedural problems at the working level; use and adaptation of bookkeeping machines and electronic data processing to cash control, customer billings, payables, payrolls and payroll taxes, sales analyses and inventory and cost control. *Prerequisite:* Acc. 315 or equivalent. Offered in alternate years; next offered in 1966-67.
- Acc. 413 Federal and State Tax Accounting (0+6)** 3 Credits Fall
414 3 Credits Spring
Fall semester: Basic principles of the federal income tax; application of these principles to individual taxpayers; practice in the preparation of tax returns.
Spring semester: Application of income tax principles to business operations; state taxes and their operation; practice in the preparation of tax returns for business entities. *Prerequisite:* Acc. 413, 315 or equivalent. Acc. 414, 413 or equivalent.
- Acc. 416 Advanced Accounting (0+6)** 3 Credits Spring
Accounting problems involved in creation, operation and liquidation of business entities. Consideration of accounting problems most frequently encountered in partnerships, corporations, estates, trusts and receiverships. *Prerequisite:* Acc. 315 or equivalent. Offered in alternate years; next offered in 1967-68.
- Acc. 417 Cost Accounting (3+0)** 3 Credits Fall
Principles and procedures for determining production and operating costs; factors in reducing costs; interpretation and analysis of cost data. *Prerequisite:* Acc. 315 or equivalent.
- Acc. 418 Auditing (3+0)** 3 Credits Spring
Principles, standards and working procedures of audit verification and analysis; functions of public accountants and internal auditors. *Prerequisite:* Acc. 315 or equivalent.
- Acc. 493 Special Topics** Credits Arr. Fall
494 Credits Arr. Spring
An area in which the student has a special interest. Independent research, outside reading, and periodic reports are included. *Admission by arrangement.*
- Acc. 613 Accounting for Specific Industries** Credits Arr. Fall
For students wishing to make an intensive study of an industry; who have access to sufficient private accounting data to form the basis of analytical research; and written permission to use the data. Material developed cannot be used to fulfill the requirements to Acc. 697 or 698. *Prerequisite:* Graduate standing and 15 hours of accounting including Acc. 416, 417 and 418 or equivalent.
- Acc. 616 Advanced Tax Problems** Credits Arr. Spring
Problems in complex areas of Federal income tax including partnerships, corporations, fiduciaries, contractors, pensions, annuities, reorganizations and non-taxable exchanges. *Prerequisite:* Graduate standing and 15 hours of accounting including Acc. 413, 414, 416, or equivalent. Offered as demand warrants.
- Acc. 617 Advanced Auditing** Credits Arr. Fall
Advanced aspects of auditing including requirements of the Securities and Exchange Commission, state regulatory bodies, banking and credit agencies, stock exchanges, and the American Institute of Certified Public Accountants. The course will use an illustrative audit wherein working papers and a typical audit report must be prepared. *Prerequisite:* Graduate standing and 15 hours of accounting including Acc. 416 and 418, or equivalent. Offered as demand warrants.
- Acc. 618 Advanced Cost Accounting** Credits Arr. Spring
More complex areas of cost accounting, including standard costs, cost variations, analysis of manufacturing costs, and techniques and procedures of affecting economies in production and distribution. *Prerequisite:* Graduate standing and 15 hours of accounting including Acc. 417 and 418, or equivalent. Offered as demand warrants.
- Acc. 621 Advanced Accounting Problems (0+6)** 3 Credits Fall
622 3 Credits Spring
Analytical study of material covered in C.P.A. examinations and professional writings on accounting subjects. The course involves working problems under examination conditions and discussion of points involved. *Prerequisite:* Senior or graduate standing and 15 hours of accounting including Acc. 416, 417 and 418, or equivalent.
Fall semester: Consideration of timely questions as covered by the auditing and theory of accounts sections of recent C.P.A. examinations.
Spring semester: Analysis of current accounting developments as presented in recent examinations in accounting practice.

Acc. 627 Professional Accounting (0+6) 1, 2, or 3 Credits Fall
A study of accounting in specific areas of professional practice. Separate consideration and coverage is given to budgeting, controllership and public accounting. *Prerequisite: Senior or graduate standing and 15 hours of accounting. Offered as demand warrants.*

Acc. 628 Governmental and Institutional Accounting Credits Arr. Spring
Procedures and systems employed by states, municipalities and other governmental units. *Offered as demand warrants. Prerequisite: Senior or graduate standing and 15 hours of accounting.*

Acc. 629 Accounting Theory (3+0) 2 Credits Fall
Emphasis on current proposals and developments, to meet the needs of those preparing to take the C.P.A. examination or who expect to teach accounting. *Offered as demand warrants. Prerequisite: Senior or graduate standing or permission of instructor.*

Acc. 629 Accounting Seminar (3+0) 2 Credits Fall
630 2 Credits Spring
Discussion of areas such as new developments and proposals, problems in public practice, inter-professional relationships and similar topics. *Offered as demand warrants. Prerequisite: Graduate standing or permission of instructor.*

Acc. 631 Internship Credits Arr. Fall
Spring

For students with employment experience beyond the clerical level. Independent research and reading is required which will supplement knowledge and experience gained from the employment internship. Credit is not given for material used in Acc. 613. The work in this course may partially fulfill requirements for Acc. 697-698. *Prerequisite: Graduate standing, advance approval of the instructor and written permission of the employer that the private accounting material may be used for class purposes.*

Acc. 693 Special Topics Credits Arr. Fall
694 Credits Arr. Spring

Prerequisite: Graduate standing and permission of the instructor.

Acc. 697 Thesis Credits Arr. Fall
698 Credits Arr. Spring

AGRICULTURAL SCIENCE

Ag. 301 Agricultural Prices (3+0) 3 Credits Fall
Analysis and interpretation of factors affecting agricultural prices; study of price movements; price policy. *Prerequisites: Econ. 121, 122. Offered as demand warrants.*

Ag. 310 Animal Husbandry (2+3) 3 Credits Spring
Origin, history and economic significance of major breeds of dairy and beef cattle, swine, sheep and poultry. Introduction to management, with special reference to Alaska. *Offered as demand warrants.*

Ag. 382 Horticulture (2+3) 3 Credits Spring
Survey; principles of propagation, culture and use; soil, light and water requirements; planting and harvesting; insect, weed and disease control. *Prerequisite: Biol. 105, 106. Offered as demand warrants.*

Ag. 404 Agricultural Marketing (3+0) 3 Credits Spring
Principles and practices of agricultural marketing; prices and costs; case studies. *Prerequisite: Econ. 121. Offered as demand warrants.*

Ag. 491 Seminar (Arrange) Credits Arr. Fall
492 Credits Arr. Spring

Unique problems in agricultural development of Alaska, the role of agriculture in Alaska's economy, and recent research advances in the State. Subject matter fields: Economics, agronomy, animal industry, soils, horticulture and agricultural engineering. *Offered as demand warrants.*

Ag. 493 Special Topics (Arrange) Credits Arr. Fall
494 Credits Arr. Spring

Various subjects studied principally through directed reading and supervised projects. *Offered as demand warrants.*

ANTHROPOLOGY

- Anth. 101 The Study of Man (3+0)** 3 Credits Fall or Spring
Introductory anthropological and geographical studies, including a survey of the origin and development of culture, a study of human behavior and mechanics of cultural and social change.
- Anth. 202 Cultural Anthropology (3+0)** 3 Credits Fall or Spring
Ways of living among peoples of the world; includes basic theories and concepts of current cultural anthropology. *Prerequisite: Anth. 101 or by permission.*
- Anth. 212 Human Origins (3+0)** 3 Credits Spring
Old World prehistory from the Lower Palaeolithic to historical times.
- Anth. 302 Physical Anthropology (2+3)** 3 Credits Spring
Basic physical and constitutional anthropology, designed for students preparing for medical school or professional work in anthropology. *Prerequisite: Anth. 101, 212, or Biol. 105, 106.*
- Anth. 304 Africa (3+0)** 3 Credits Fall or Spring
Peoples and cultures of Africa. *Prerequisite: Anth. 101.*
- Anth. 306 Oceania (3+0)** 3 Credits Spring
Ethnic groups and cultures of Indonesia, Micronesia, Melanesia, Polynesia and Australia. *Prerequisite: Anth. 101.*
- Anth. 312 North American Archaeology (3+0)** 3 Credits Fall or Spring
Prehistoric cultures north of Mexico. Archaeological methods peculiar to America and problems related to the prehistory of the Arctic regions. *Prerequisite: Anth. 212.*
- Anth. 313 Archaeology of Central and South America (3+0)** 3 Credits Fall or Spring
Continuation of Anthropology 312. Development of civilization in the Valley of Mexico and in the Mayan and Andean areas. *Prerequisite: Anth. 312 or permission.*
- Anth. 325 Peoples of the Arctic (3+0)** 3 Credits Fall
Ethnic groups and cultures in circumpolar lands. *Prerequisite: Anth. 101 or 212.*
- Anth. 329 Peoples of Central and Northern Asia (3+0)** 3 Credits Fall
Native peoples of Siberia and adjoining regions. *Prerequisite: Anth. 101.*
- Anth. 331 Primitive Religion (3+0)** 3 Credits Fall
Comparing selected primitive religions and mythologies; their function in the cultural context. For advanced students in liberal arts and social sciences. *Prerequisite: Anth. 304 or 306 or Junior standing or by permission.*
- Anth. 335 North American Ethnology (3+0)** 3 Credits Fall
Racial distribution, material and social cultures of Indians of North America. *Recommended prerequisite: Anth. 101.*
- Anth. 336 Ethnology of Central and South America (3+0)** 3 Credits Spring
Racial distribution, material and social cultures of peoples of Central and South America. *Prerequisite: Anth. 101.*
- *Anth. 342 Alaska Natives (3+0)** 3 Credits Spring
Indians and Eskimos of Alaska. Social organization, social customs and problems of acculturation. Primarily for students who expect to teach in Alaska. *Prerequisite: Anth. 101, Hist. 341 or Junior Standing.*
- Anth. 351 Primitive Technology (2+3)** 3 Credits Fall
Material culture of primitive man with emphasis upon aspects of economic importance. (The laboratory will allow students to practice techniques, examine specimens, etc.) *Prerequisite: Anth. 101 and Anth. 312.*
- *Anth. 411 Arctic Archaeology (2+3)** 3 Credits Fall
Research problems of Arctic prehistory. Limited to students interested in archaeological materials in the University museum representing early culture in Arctic America. *Prerequisite: Anth. 312.*
- *Anth. 412 Arctic Archaeology (2+3)** 3 Credits Spring
Continuation of Anthropology 411, including a practical study of methods of field and laboratory research with emphasis on Eskimo prehistory. *Prerequisite: Anth. 312 and 411.*

Anth. 423 Social Anthropology (3+0) 3 Credits Fall
Basic course stressing social structure, acculturation, religion, and folklore of Arctic America.
Prerequisite: Anth. survey course on 300 level and Junior standing or permission.

Anth. 430 Anthropological Field Methods (1+3) 2 Credits Spring
Laboratory and demonstration to prepare the student for field work and inform him of recently developed techniques of collecting field data. Concentration on one of following: Archaeology, ethnography, physical anthropology. *Prerequisite: Junior standing and permission of instructor. As demand warrants.*

***Anth. 491 Seminar in American Archaeology (2+0)** 2 Credits Fall or Spring
Archaeological problems in America and prescribed research utilizing current literature.
Prerequisite: Anth. 312.

***Anth. 492 Seminar in American Ethnology (2+0)** 2 Credits Fall or Spring
Anthropological literature and research in selected problems. *Prerequisite: Anth. 335, 423, or permission.*

Anth. 493 Special Topics Credits Arr. Fall
494 Credits Arr. Spring
Various subjects studied in special fields in anthropology. *Prerequisite: Senior standing or permission.*

Anth. 497 Thesis or Project Credits Arr. Fall
498 Credits Arr. Spring
Advanced students who have shown special aptitude for individual study or research may elect thesis or project work, on approval of the Head of the Department.

Anth. 691 Seminar Credits Arr. Fall
692 Credits Arr. Spring
Topics include physical and social anthropology, comparative archaeology, ethnological theory. *Admission by arrangement.*

Anth. 693 Special Topics Credits Arr. Fall
694 Credits Arr. Spring
Various subjects studied, principally by directed study, discussion and research. *Admission by arrangement.*

ART

Art 105 Freehand Drawing (0+4) 2 Credits Fall
106 2 Credits Spring
Pictorial design, life drawing, landscape drawing, using varied techniques and media.

Art 161 Design and Color Theory (1+3) 2 Credits Fall
162 2 Credits Spring
Creative designing and rendering. Emphasis on mass-space relationships and composition, value transitions and hues, colorwheel, color and intensity movements.

Art 205 Life Drawing and Composition 2 Credits Fall
206 2 Credits Spring
Problems in drawing from life, exploring possibilities in pictorial design and composition, still life, anatomy and perspective. *Prerequisite: Art 106 or permission.*

Art 207 Beginning Printmaking (0+4) 2 Credits Fall
208 2 Credits Spring
Various intaglio and relief printing media, engraving, etching, woodcut and other graphic media. *Prerequisite: Art 106 or permission.*

Art 209 Beginning Metalcraft (0+4) 3 Credits Fall
210 3 Credits Spring
Material processes and techniques for silver jewelry and silversmithing. *Prerequisite: Art 161 or permission.*

Art 211 Beginning Sculpture (0+6) 3 Credits Fall
212 3 Credits Spring
Original, creative studies in clay, wood and stone sculpture. Emphasis on mastery of techniques and material processes.

Art 213 Beginning Oil Painting (0+6) 3 Credits Fall
214 3 Credits Spring
Basic investigation of materials and their use in expressing the students' ideas. *Prerequisite: Art 106 and 162 or permission.*

Art 261 History of World Art (3+0) 262	3 Credits 3 Credits	Fall Spring
Origins of art and its progressive development from the beginning to contemporary art; emphasis on change and progress. <i>Prerequisite: Sophomore standing. Term paper required each semester.</i>		
Art 305 Advanced Life Drawing and Anatomy (0+4) 306	2 Credits 2 Credits	Fall Spring
Creative approach, including a comprehensive study of functional human anatomy, with the human figure as an art motif. <i>Prerequisite: Art 206 or permission.</i>		
Art 307 Intermediate Printmaking (0+4) 308	2 Credits 2 Credits	Fall Spring
Additional study and experimentation in intaglio, relief and planographic printing techniques, including lithography, serigraphy and color printing. <i>Prerequisite: Art 208 or permission.</i>		
Art 309 Intermediate Metalcraft (0+4) 310	3 Credits 3 Credits	Fall Spring
Material processes and techniques for silver jewelry and silversmithing; creating problems in artistic design. <i>Prerequisite: Art 210 or permission.</i>		
Art 311 Intermediate Sculpture (0+4) 312	3 Credits 3 Credits	Fall Spring
Creative studies in welding, plaster casting, concrete casting, sandcasting, clay modeling, wood carving and stone carving. <i>Prerequisite: Art 212 or permission.</i>		
Art 313 Intermediate Oil Painting (0+4) 314	2 Credits 2 Credits	Fall Spring
Creating pictorial problems in oil painting techniques, still life, composition, and figure painting. <i>Prerequisite: Art 214 or permission.</i>		
Art 407 Advanced Printmaking (0+4) 408	2 Credits 2 Credits	Fall Spring
Advanced study in all printing media. <i>Prerequisite: Art 308 or permission.</i>		
Art 409 Advanced Metalcraft (0+4) 410	3 Credits 3 Credits	Fall Spring
Continued investigation and experimentation of Intermediate Metalcraft. <i>Prerequisite: Art 310 or permission.</i>		
Art 411 Advanced Sculpture (0+6) 412	3 Credits 3 Credits	Fall Spring
Styro-foam burn-out, aluminum, bronze casting, steel welding, repouse sculpture, plastics, inlay, and architectural sculpture. <i>Prerequisite: Art 312 or permission.</i>		
Art 413 Advanced Oil Painting (0+4) 414	2 Credits 2 Credits	Fall Spring
Exploration and development of the creative approach to various techniques involved in figure, landscape, abstract and non-objective painting and pictorial design. <i>Prerequisite: Art 314 or permission.</i>		
Art 415 History of Modern Art (2+0) 416	2 Credits 2 Credits	Fall Spring
The five major art movements of the 19th century and the major leaders of art movements in the 20th century.		
Art 419 History of Northern Renaissance Art (3+0) 420	3 Credits 3 Credits	Fall Spring
Pre-Renaissance Painting, sculpture, architecture and minor arts of the Netherlands through the Netherlands Renaissance; Renaissance Painting in France and Germany; the humanist and reformative influences on artistic developments.		
Art 493 Special Topics 494	Credits Arr. Credits Arr.	Fall Spring
Various subjects in art. <i>Admission by arrangement.</i>		

BIOLOGICAL SCIENCES

- Biol. 105 Fundamentals of Biology (3+3)** 4 Credits Fall
106 4 Credits Spring
Principles of living systems as illustrated in unicellular and multicellular organisms; mechanisms of growth, development, heredity and evolution; introduction to plant and animal kingdoms. An introductory course open to students in all curricula. *Prerequisite for Biol. 106: Biol. 105 or permission.*
Fall semester: Basic principles; structure and function of vertebrates and vascular plants.
Spring semester: Plant and animal kingdoms.
- Biol. 208 Organic Evolution (2+0)** 2 Credits Spring
Evidences, mechanisms, and directive forces. *Prerequisite:* Biol. 105, 106. *Offered alternate years; next offered 1967-68.*
- Biol. 214 Microbiology (2+6)** 4 Credits Spring
General microbiology. Micro-organisms, classification, morphology and physiology. Disease, sources and modes of infection, sterilization. Laboratory includes preparation of culture media; examinations of milk, water, air and soil. *Prerequisite:* Chem. 102, a laboratory course in elementary biology, or by permission.
- Biol. 233 Morphology of Nonvascular Plants (2+3)** 3 Credits Fall
Comparative study of the structure, reproduction, development, and phylogenetic relationships of the major groups of nonvascular plants. *Prerequisite:* Biol. 105, 106. *Offered alternate years; next offered 1966-67.*
- Biol. 234 Morphology and Anatomy of Vascular Plants (3+3)** 4 Credits Spring
Comparative study of morphology, developmental anatomy, phylogenetic trends, and life histories of the major groups of vascular plants. *Prerequisite:* Biol. 105, 106. *Offered alternate years; next offered 1966-67.*
- *Biol. 302 Genetics (3+0)** 3 Credits Spring
Principles of inheritance in plants and animals; the physico-chemical properties of genetic systems. *Prerequisite:* Biol. 105, 106.
- *Biol. 303 Principles of Ecology (3+0)** 3 Credits Fall
Relationships between organisms and their environments. Communities, environmental factors affecting plants and animals, population structure, and reaction of organisms. Several all day field trips. *Prerequisite:* Biol. 105, 106, or permission.
- *Biol. 305 Invertebrate Zoology (3+3)** 4 Credits Fall
Structure, function, classification, evolution, and life histories of invertebrate animals. Several all day field trips. *Prerequisite:* Biol. 105, 106.
- *Biol. 307 Parasitology (2+3)** 3 Credits Fall
Classification, morphology, life history, and ecology of parasites of animals. *Prerequisite:* Biol. 105, 106. *Offered alternate years; next offered 1967-68.*
- Biol. 317 Comparative and Developmental (2+9)** 5 Credits Fall
318 Anatomy of Vertebrates (3+6) 5 Credits Spring
Structure, development, and evolution of organs and organ systems of vertebrates, including histology. Laboratory studies of whole and sectioned embryos of amphioxus, frog, and chick; detailed anatomical studies of representative vertebrate types; and microscopic examinations of principal tissues and organs.
Fall semester: Comparative Anatomy.
Spring semester: Embryology and Histology.
Prerequisite: Biol. 105, 106 and Junior standing or a B grade in Biol. 105, 106.
- *Biol. 323 Mammalogy (2+3)** 3 Credits Fall
The mammals of the world—their origin, evolution, taxonomy, zoogeography, life history, and habits. *Prerequisite:* Biol. 105, 106, and a course in anatomy or permission.
- *Biol. 324 Ornithology (2+3)** 3 Credits Spring
Structure and adaptation, habits, life history, distribution, and classification of birds. Early morning field trips. *Prerequisite:* Biol. 105, 106, and a course in anatomy or permission.
- *Biol. 326 Ichthyology (2+3)** 3 Credits Fall
Classification, evolution, anatomy, and special modifications of fishes. *Prerequisite:* Biol. 105, 106, and a course in anatomy or permission.

- *Biol. 331 Systematic Botany (2+6)** 4 Credits Fall
Identification, nomenclature, and classification of vascular plants emphasizing taxonomic principles, mechanism of variation, classical and newer methods of taxonomic research and characteristics of major plant families. Several all day field trips. *Prerequisite:* Biol. 105, 106.
- Biol. 401 Medical Technology** 30 Credits Fall
Twelve-month medical technology internship at an affiliated hospital school, including work in clinical chemistry, hematology, microbiology, serology, parasitology, and histologic technique. *Prerequisite:* Senior standing in medical technology curriculum with the prior two semesters having been in residence at the University of Alaska; acceptance by an affiliated school of medical technology.
- *Biol. 413 Cell Physiology (2+3)** 3 Credits Fall
Physical and chemical properties of protoplasm; morphology and function of the cell in relation to the life of the organism. Major topics: Passive and active transport, photosynthesis, respiration, enzymes, metabolism. *Prerequisites:* Chem. 101, 102, and Biol. 105, 106; Chem. 321 or 223 recommended.
- *Biol. 414 Comparative Physiology (3+3)** 4 Credits Spring
Water, ion, and nitrogen balance; temperature regulation; and circulatory, muscle, hormone, and nervous systems in the various animal phyla. *Prerequisite:* Chem. 101, 102, and Biol. 105, 106; Chem. 223 or 321 and Biol. 413 recommended.
- *Biol. 416 Plant Physiology (2+3)** 3 Credits Spring
Metabolic processes in higher plants. *Prerequisite:* Chem. 101, 102; Biol. 105; Biol. 413 recommended. Offered alternate years; next offered 1967-68.
- Biol. 491 Seminar (Arrange)** Credits Arr. Fall
492 Credits Arr. Spring
Topics in Biological Sciences
- Biol. 493 Special Topics (Arrange)** Credits Arr. Fall
494 Credits Arr. Spring
Special fields in Biological Sciences. *Prerequisite:* Senior standing or permission. Offered as demand warrants.
- Biol. 495 Research** Credits Arr. Fall
496 Credits Arr. Spring
Guided investigation, either laboratory or field, for qualified Seniors. Admission by arrangement.
- Biol. 616 Principles and Methods of Taxonomy (2+3)** 3 Credits Spring
Modern taxonomic ideas and their application to zoological and botanical problems. Offered alternate years; next offered 1966-67.
- Biol. 618 Biogeography (2+0)** 2 Credits Spring
Spatial and temporal geography of plant and animal groups; emphasis on environmental and historical features and controlling present patterns of distribution. Offered alternate years; next offered 1967-68.
- Biol. 627 Physiological Ecology (2+3)** 3 Credits Fall
Interaction between organisms and their environment with emphasis on the function of the organism as affected by physical stimuli such as light, heat, water, ions, and biotic stimuli such as competition. Each environmental factor is considered at the molecular, cellular, organismic, population, and community levels. Offered alternate years; next offered 1966-67.
- Biol. 637 Modern Evolutionary Theory (2+0)** 2 Credits Fall
Contemporary ideas and problems of the mechanics of evolution. Offered alternate years; next offered 1967-68.
- Biol. 691 Seminar** Credits Arr. Fall
692 Credits Arr. Spring
Topics in Biological Sciences. Offered as demand warrants.
- Biol. 693 Special Topics** Credits Arr. Fall
694 Credits Arr. Spring
Various subjects, including advanced studies in ecology, evolution, taxonomy, biogeography, physiology, animal behavior, etc. Admission by arrangement.

- Biol. 695 Research** Credits Arr. Fall
696 Credits Arr. Spring
Investigation, either field or laboratory, of a problem of lesser scope than the thesis, or supplementary to the thesis. *Admission by arrangement.*
- Biol. 697 Thesis** Credits Arr. Fall
698 Credits Arr. Spring
Admission by arrangement.

BUSINESS ADMINISTRATION

- B.A. 323 Corporate Organization and Finance** 3 Credits Fall
Principles in organizing and capitalizing a modern American business. Legal formation of corporations, factors determining capital requirements; various methods used in providing corporate capital.
- B.A. 331 Business Law (3+0)** 3 Credits Fall
332 3 Credits Spring
Survey of the legal aspects of business problems; basic principles, institutions, and administration of law.
Fall semester: Contracts, agency, employment, negotiable instruments, personal property sales.
Spring semester: Insurance, suretyship, partnerships, corporations, real property, trusts and wills, bankruptcy, torts and business crimes. *Prerequisite:* Third-year standing.
- B.A. 343 Marketing (3+0)** 3 Credits Fall
Fundamental problems; simulation exercises; interrelations of marketing with other business activities; conceptual and quantitative sciences in marketing. *Prerequisite:* Econ. 121-122.
- B.A. 359 Regulation of Industry (3+0)** 3 Credits Fall or Spring
Effects of government regulation, economic policy and executive policy on private and public enterprise.
- *B.A. 361 Industrial Relations (3+0)** 3 Credits Fall
Personnel practice in industry; analysis of labor-management problems; methods and administration of recruiting, selecting, training and compensating employees; labor laws and their applications.
- *B.A. 363 Production Management (3+0)** 3 Credits
Practices and principles of scientific management of all business enterprises; principles of organization and techniques of management relating to planning organization, policies, controls, and methods improvement. *Prerequisite:* Econ. 121, or permission.
- *B.A. 422 Corporate Financial Problems (3+0)** 3 Credits Spring
Financial problems frequently confronting the modern U.S. Corporation and proposed solutions. Topics include earnings retention and dividend policy, expansion and combination, refinancing and recapitalization, and treatment for financial failure.
- *B.A. 423 Investment Management (3+0)** 3 Credits Fall or Spring
Management securities, portfolios of individuals and institutions; basic security analysis; investment policies of banks, insurance companies, investment companies, and fiduciaries.
- *B.A. 424 Managerial Economics (3+0)** 3 Credits Spring
The use of economic analysis in the operation of businesses and industries; application of the approach of economics to executive decisions with emphasis on concepts that can be measured and applied to problems of management. *Prerequisite:* Econ. 321.
- *B.A. 442 Marketing Institutions and Channels (3+0)** 3 Credits Spring
Analysis of industry and firm operations as marketing institutions; evolution of distribution channels; and contemporary marketing problems.
- *B.A. 443 Marketing Theory and Analysis of Market Change (3+0)** 3 Credits Fall or Spring
Economic, sociological, psychological and anthropological factors influencing behavior of consumer and business units; long-run and short-run behavior change. The construction and use of mathematical models in marketing; application of digital computers in marketing systems analysis and control. *Prerequisite:* Math. 121, 122, 204, B.A. 343, and completion of behavioral science requirements.

B.A. 462 Administrative Policy (3+0)	3 Credits	Spring
Organization role in a dynamic society; decision problems in varying social, economic and political environments.		
B.A. 480 Organization Theory (3+0)	3 Credits	Fall or Spring
Literature or organizational theory; emphasis on theoretical concepts, social science research techniques and organizational behavior. <i>Prerequisite: Upper Division standing, completion of behavioral science requirements, or permission of instructor.</i>		
B.A. 493 Special Topics	Arr.	Fall
494	Arr.	Spring
B.A. 693 Special Topics	Arr.	Fall
694	Arr.	Spring
B.A. 648 Mathematical Method and Computers Workshop (3+0)	3 Credits	Fall or Spring
Selected topics in the use of mathematical models, econometric techniques and computers in marketing; individual research projects. <i>Prerequisite: permission of instructor.</i>		
B.A. 691 Seminar on Market Analysis (3+0)	3 Credits	Fall or Spring
Analysis of factors affecting consumer trial and adoption of product innovation. Emphasis on current behavioral science research. <i>Prerequisite: permission of instructor.</i>		
B.A. 697 Thesis	Credits Arr.	Fall
698	Credits Arr.	Spring

CHEMICAL ENGINEERING

*CH.E. 433 Applied Chemical Kinetics (3+0)	3 Credits	Fall
Kinetics of various reactions. Prediction of course of reactions. <i>Prerequisite: Chem. 332 or 532, Ch.E. 477, 479 and 486.</i>		
CH.E. 477 Unit Operations (3+0)	3 Credits	Fall
Fundamental unit operations; principles of fluid film theory, flow of fluids, flow meters, heat transmission, evaporation, crushing grinding size separation, filtration, crystallization, vaporization, diffusion, adsorption, extraction, distillation, humidity, air conditioning, drying. <i>Prerequisite: Chem. 202, Math. 202, Phys. 212, and E.S. 346 or Chem. 331.</i>		
CH.E. 479 Unit Operation Laboratory (0+3)	1 Credit	Fall
Experiments on unit operations. Concurrent: Ch.E. 477.		
CH.E. 486 Chemical Engineering Thermodynamics (3+0)	3 Credits	Spring
Application of thermodynamics and principles of physical chemistry to physical and chemical equilibria encountered in Chemical Engineering processes. <i>Prerequisite: Chem. 332, Math. 310, E.S. 346 or Chem. 331, and Ch.E. 477 recommended.</i>		
CH.E. 491 Seminar (1+0)	1 Credit	Spring
Current Topics in Chemical Engineering		
*Ch.E. 487 Advanced Unit Operations (3+0)	3 Credits	Fall
488	3 Credits	Spring
Advanced treatment of flow of fluids, flow of heat, crystallizations, diffusion, distillation, adsorption, fuels and combustion. <i>Prerequisite: Ch.E. 477.</i>		
*CH.E. 490 Unit Operations Laboratory (0+6)	2 Credits	Spring
Experiments on unit operations. <i>Prerequisites: Ch.E. 486, Ch.E. 587, Ch.E. and 588 concurrent.</i>		
*CH.E. 493 Special Topics	Credits Arranged	Fall
494	Credits Arranged	Spring
Subjects include chemical engineering thermodynamics, unit processes in organic synthesis, industrial chemistry, inorganic chemical technology, nuclear chemical catalysis. <i>Prerequisite: Appropriate for subject given.</i>		

CHEMISTRY

- Chem. 101 General Chemistry (3+3)** 4 Credits Fall
102 General Chemistry & Introductory Qual. Analysis (3+3) 4 Credits Spring
 General chemistry and introductory qualitative analysis. *Fall semester:* General principles, chemistry of the non-metals. *Spring Semester:* Chemistry of the metals, and qualitative analysis.
- Chem. 103 Introductory Chemico-Physical Science (3+0)** 3 or 4 Credits Fall
 or (3+3)
104 3 or 4 Credits Spring
 Descriptive course in Chemico-Physical Science. Either semester may be taken separately. One 3-hr. laboratory period may be elected but must be concurrent with lecture program.
- Chem. 201 General and Quantitative Chemistry (3+3)** 4 Credits Fall
202 4 Credits Spring
Fall Semester: Classical principles of chemistry, atomic structures and the periodic table, molecular structure, the states of matter. For students in engineering. *Prerequisite:* Math. 102, E.S. 112, high school chemistry or Chem. 104 or Chem. 101 recommended.
- Chem. 207 Problems in Chemistry (Arrange)** 1 or 2 Credits Fall
208 1 or 2 Credits Spring
 Supplementary work, problems or topics in chemistry, designed for those especially interested in chemistry. *Prerequisite or concurrent:* Chem. 101 or 201.
- Chem. 212 Introductory Quantitative Analysis (2+6)** 4 Credits Spring
 General principles of chemical analysis; introduction to volumetric and gravimetric methods. Theory, problems and laboratory. *Prerequisite:* Chem. 102 or 202, Math. 102 or 104.
- Chem. 217 Elemental Qualitative Analysis (2+6)** 4 Credits Fall
 Qualitative Analysis including rarer elements. The theoretical basis of equilibria and its applications, etc., lectures, laboratories, problems. *Prerequisite:* Chem. 102 or Chem. 201, Math. 101 or 103 or equivalent.
- *Chem. 223 Introductory Organic Chemistry (3+3)** 4 Credits Fall
 For students in curricula requiring a one-semester terminal course in Organic Chemistry. *Prerequisite:* Chem. 102 or Chem. 202.
- Chem. 224 Introductory Biochemistry (2+3)** 3 Credits Spring
 For students in curricula requiring a one-semester terminal course in Biochemistry. *Prerequisite:* Chem. 223 or Chem. 321.
- *Chem. 321 Organic Chemistry (3+3)** 4 Credits Fall
322 4 Credits Spring
 Organic chemistry; preparation and properties of simple aliphatic and aromatic compounds. For Chemistry, Chemical Engineering, Premedical, Biochemistry, Science, etc. *Prerequisite:* Chem. 102 or 202 for Chem. 321; Chem. 321 for Chem. 322.
- *Chem. 331 Physical Chemistry (3+3)** 4 or 5 Credits Fall
332 4 or 5 Credits Spring
Fall Semester: Three states of matter, principles of heat and thermodynamics and applications; solutions, colloids.
Spring Semester: Thermochemistry, second and third laws of thermodynamics, equilibria, chemical kinetics, electrical phenomena, atomic structure, molecular structure, photochemistry. *Prerequisite:* For Chem. 331, Chem. 202 or 212, Math. 102, Phys. 104 or 212. For Chem. 332, Chem. 331.
- *Chem. 401 Inorganic Chemistry (3+0) or (3+3)** 3 or 4 Credits Fall
402 3 or 4 Credits Spring
 Systematic presentation of inorganic chemistry emphasizing properties of various families of the periodic system. *Prerequisite:* Chem. 102 or Chem. 202 with grade of C or better. Offered as demand warrants.
- *Chem. 416 Chemical Analysis (1+6)** 3 Credits Spring
 Analysis of mixtures illustrating principles of chemical separations, potentiometric and conductometric titrations; colorimetric methods; chromatographic methods; organic reagents for metals and their use in trace analysis. *Prerequisite:* Chem. 212, or 202 with permission.

- *Chem. 425 Organic Qualitative Analysis (1+6)** 3 Credits Fall
Identification of pure organic compounds and mixtures. *Prerequisite:* Chem. 222. *Offered as demand warrants.*
- *Chem. 451 General Biochemistry (3+3)** 4 Credits Fall
452 4 Credits Spring
General principles of biochemistry. Chemistry and metabolism of carbohydrates, lipids, and proteins together with a consideration of enzymes, vitamins, hormones and other biocatalysts; chemistry and physiology of living tissues, blood, and urine. *Prerequisite:* Chem. 321 (but not concurrent), Chem. 212 with Chem. 331 recommended.
- *Chem. 486 Chemical Thermodynamics (3+3)** 3 Credits Spring
Classical thermodynamics as applied to chemistry with brief introduction to statistical thermodynamics. *Prerequisite:* Chem. 332 or E.S. 346, Math. 302.
- Chem. 491 Seminar (1+0)** 0 or 1 Credit Fall
492 0 or 1 Credit Spring
Discussion of current literature.
- *Chem. 493 Special Topics** Credits Arranged Fall
494 Credits Arranged Spring
Various subjects studied including advanced organic chemistry, advanced physical chemistry, advanced analytical chemistry, history and literature of chemistry, industrial chemistry, instrumental analysis, chemistry of radioactivity and isotopes, petroleum chemistry, spectroscopy. *Prerequisite:* At least junior standing and three semesters (or 12 credits) of college chemistry with grade of C or better.
- Chem. 495 Research** Credits Arranged Fall
496 Credits Arranged Spring
Introduction to research at the undergraduate level. Admission is by arrangement with an individual faculty member and with the approval of the Department Head.
- Chem. 601 Inorganic Chemistry (3+0)** 3 Credits Fall
602 3 Credits Spring
Techniques of study in inorganic chemistry. Periodic relationships among the elements, theories of valence, complex inorganic compounds, chemistry of typical elements and groups of elements. *Offered as demand warrants.*
- Chem. 609 Advanced General Chemistry (3+3)** 3 or 4 Credits Fall
610 3 or 4 Credits Spring
First Semester: Intensive review of general chemistry, classical and modern atomic theory, applications to periodic classification; modern theories of valence, molecular structure, etc.; kinetic molecular theory change of state, theory of solutions, etc; chemical reactivity and its interpretations; energy of chemical reactions, cells, oxidation-reduction reactions, reaction velocity, ionic reactions.
Second Semester: Applications of theory and principles to typical groups of elements, acid-base theory, complex ions, radio-chemistry. Organic chemistry and biochemistry (8 weeks), emphasizing structure determination and structural formulae with some treatment of systematic nomenclature, synthesis and biochemical processes. Laboratory work (optional) will include experiments on special techniques, qualitative and quantitative analysis, organic and biochemical preparations and qualitative tests. *Prerequisite:* One year or equivalent of general chemistry. *Offered as demand warrants.*
- Chem. 611 Analytical Chemistry (1+6)** 3 Credits Fall
612 3 Credits Spring
Emphasis on the theoretical interpretation of structure and reactions. One year of analytical chemistry. *Offered as demand warrants.*
- Chem. 621 Organic Chemistry (3+0)** 3 Credits Fall
622 3 Credits Spring
Emphasis on the theoretical interpretation of structure and reactions. *Prerequisite:* One year of organic chemistry. *Offered in alternative years; next offered 1966-67.*
- Chem. 631 Physical Chemistry (3+0)** 3 Credits Fall
632 3 Credits Spring
Fundamental physico-chemical principles with special emphasis on thermodynamics and chemical kinetics. *Prerequisite:* One year course in undergraduate physical chemistry. *Offered as demand warrants.*

- Chem. 647 The Nature of the Chemical Bond (3+0)** Fall
Electronic structure of molecules and its correlation with the chemical and physical properties of substances, non-mathematical.
- Chem. 648 Quantum Mechanics with Chemical Applications (3+0)** Spring
Quantitative introduction to quantum mechanics. Theoretical and experimental aspects of the electronic wave functions of molecules.
- Chem. 651 Selected Topics in Biochemistry (2+0)** 2 Credits Fall
652 2 Credits Spring
Topic areas: vitamins and hormones, carbohydrates, physical biochemistry, nucleic acids, lipids, enzymes, protein chemistry; intermediary metabolism, oxidate enzyme systems, pathways of metabolism, biochemistry of the cell nucleus, etc. *Prerequisite: One year of biochemistry or one year of organic chemistry or permission.*
- Chem. 691 Seminar (1+0)** 1 Credit Fall
692 1 Credit Spring
Reviews of current research.
- Chem. 693 Special Topics** Credits Arranged Fall
694 Credits Arranged Spring
Various subjects, including kinetics, thermodynamics, statistical mechanics, photochemistry, colloid chemistry, nuclear chemistry, etc.
- Chem. 695 Research** Credits Arranged Fall
696 Credits Arranged Spring
Research which is not directly connected with thesis work. Admission is by arrangement with an individual faculty member and with the approval of the Department Head.
- Chem. 697 Thesis** Credits Arranged Fall
698 Credits Arranged Spring

CIVIL ENGINEERING

- C.E. 116 Mapping (2+3)** 3 Credits Spring
Maps and scales, projections, U.S. Public Land System, aerial photos with special applications to forestry and wildlife management, plane tables, compasses, stadia, levels, transits, traverses. Intended primarily for students in Wildlife Management. *Prerequisite: Junior standing or permission of instructor. Offered in alternate years, 1967, 1969, 1971.*
- C.E. 334 Properties of Materials (1+6)** 3 Credits Spring
Properties, manufacture and testing of engineering materials. Design of concrete mixes. *Prerequisite: E.S. 331.*
- C.E. 344 Hydrology (2+0)** 2 Credits Spring
Relationship between precipitation and runoff. Infiltration, evaporation, aufeis, permafrost. Flood hydrographs and unit hydrographs. Flood routing. Statistical analyses. *Prerequisite: E.S. 341.*
- C.E. 402 Transportation Engineering (2+0)** 2 Credits Spring
Administration, economics, location, design, construction and maintenance of highways, railways, airports and other transportation facilities. *Prerequisite: C.E. 344.*
- C.E. 412 Elements of Photogrammetry (2+3)** 3 Credits Spring
Elementary study of aerial and terrestrial photographs as applied to surveying and mapping. *Prerequisite: E.S. 207.*
- C.E. 415 Surveying (1+6)** 3 Credits Fall
Traverses, curves, field astronomy, state coordinate systems, adjustments. *Prerequisite: E.S. 207.*
- C.E. 422 Foundation Engineering (2+0)** 2 Credits Spring
Principles of foundation action. Spread footings, mats, pile foundations, retaining walls and bulkheads, bridge piers, cofferdams and abutments. *Prerequisite: C.E. 435.*

- C.E. 431 Structural Analysis (3+3)** 4 Credits Spring
Statically determinate structures. Loadings. Graphical and analytical solutions for stresses and deflections. Indeterminate frames. Influence lines. *Prerequisite: E.S. 331.*
- C.E. 432 Structural Design (3+3)** 4 Credits Spring
Planning of structural systems, details connections. Reinforced concrete. Introduction to ultimate load theory. Prestressing. Composite action. *Prerequisite: C.E. 431.*
- C.E. 435 Soil Mechanics (2+3)** 3 Credits Fall
Identification, description, and physical properties of soils. Subsurface exploration, frost action. Entire soil mass surveyed for effect on substructure design. *Prerequisite: E.S. 311.*
- C.E. 441 Sanitary Engineering (2+3)** 3 Credits Fall
Sources of water supply. Design of works for the conservation, collection, treatment and distribution of water for domestic and industrial use and waste water disposal. Arctic water supplies. *Prerequisite: C.E. 344.*
- C.E. 491 Seminar** Credits Arr. Fall or Spr.
- C.E. 493 Special Topics** Credits Arr. Fall
494 Credits Arr. Spring
- C.E. 499 Advanced Engineering Problems (1+0)** 2 Credits Fall
or 2+0
General problems drawn from science and engineering. This course is preparation for registration in Professional-Engineer-in-Training.
- C.E. 603 Arctic Engineering (3+0)** 3 Credits Fall
Application of engineering fundamentals or problems of advancing civilization in Polar regions. Logistics, foundations on frozen ground and ice, thermal aspects of structures and materials; transport and communications; heating and ventilating.
- C.E. 620 Civil Engineering Construction (3+0)** 3 Credits Fall
Construction equipment and methods, construction management and accounting, construction estimates and costs. *Prerequisite: E.S. 450 or equivalent and graduate standing.*
- C.E. 631 Advanced Structural Analysis (3+0)** 3 Credits Fall
Continuation of C.E. 431. Continuity in structure. Elastic and plastic theories. Arches and shells. Tall frames. *Prerequisite: C.E. 431.*
- C.E. 632 Advanced Structural Design (2+3)** 3 Credits Spring
Design of complex structures and frames. Live, dead, and earthquake loadings. Structural joints, columns, connectors, ties and struts. Application of modern materials and techniques to design. *Prerequisite: C.E. 631.*
- C.E. 644 Hydraulic Engineering (2+3)** 3 Credits Spring
Study and design of hydraulic power projects, structures, and machines; reclamation and drainage; canals and reservoirs. *Prerequisite: E.S. 341.*
- C.E. 645 Advanced Sanitary Engineering (3+0)** 3 Credits Fall
646 3 Credits Spring
Continuation of C.E. 441; emphasizes Polar problems involving water supply, sanitation, waste disposal, water and air pollution abatement.
- C.E. 649 City and Regional Planning (3+0)** 3 Credits Fall or Spring
Elements of city and regional planning for engineers. Demography, land use, physical planning techniques.
- C.E. 691 Graduate Seminar (1+0)** 1 Credit Fall
692 1 Credit Spring
Reports and papers on engineering topics. Practice in public speaking. *Prerequisite: Permission of instructor.*
- C.E. 693 Special Topics** Credits Arranged Fall
694 Credits Arranged Spring
Various subjects. *Prerequisite: Permission of Instructor.*
- C.E. 697 Thesis** Credits Arranged Fall
698 Credits Arranged Spring
Individual study or research for students of special aptitude.

ECONOMICS

- Econ. 121 Principles of Economics I (3+0)** 3 Credits Fall
Introduction to economics; analysis and theory of national income; money and banking; public finance and taxation; economic systems.
- Econ. 122 Principles of Economics II (3+0)** 3 Credits Spring
Theory of prices and markets; income distribution; contemporary problems of labor, agriculture, public utilities, international economic relations.
- Econ. 321 Price and Allocation Theory (3+0)** 3 Credits Fall
Analysis of demand and supply under various market forms; cost and theory of production; factor pricing and theory of distribution; survey of welfare economics. *Prerequisite: Econ. 121, Econ. 122.*
- Econ. 324 Income and Employment (3+0)** 3 Credits Spring
Concepts of income; underconsumption and underinvestment theories; theory of economic maturity; implications of full employment and full investment. *Prerequisite: Econ. 121, Econ. 122, Econ. 350 or Econ. 429.*
- Econ. 337 Economic Development (3+0)** 3 Credits Fall or Spring
Theories of growth and development; problems of economic development illustrated with case studies; analysis of major policy issues. *Prerequisite: Econ. 121, Econ. 122 and three additional hours of economics or other social sciences. Offered as demand warrants.*
- Econ. 350 Financial and Monetary Theory and Policy (3+0)** 3 Credits Spring
Sources and uses of money and credit in modern society; regulation of money and credit and their impact on the economic welfare of the United States.
- Econ. 351 Public Finance and Taxation (3+0)** 3 Credits Fall or Spring
Government taxation, borrowing and spending; economic effects of taxation; influence of fiscal policy on economic activity. *Prerequisite: Econ. 121, Econ. 122. Offered in alternate years; next offered 1967-8.*
- *Econ. 425 History of Economic Thought (3+0)** 3 Credits Fall or Spring
Economic thought from the physiocrats to the present, classical and neoclassical theory, exponents and critics; contemporary development in economic theory. *Prerequisite: Econ. 121, Econ. 122 and three credits of upper division courses in economic or other social sciences. Offered as demand warrants.*
- Econ. 429 Business Fluctuations (3+0)** 3 Credits Fall
Analysis of fluctuations in economic activity; theories of business fluctuation; methods of control and forecasting. *Prerequisite: Econ. 121, Econ. 122.*
- *Econ. 432 Economic History of the United States (3+0)** 3 Credits Spring
Economic developments in American history with emphasis on impact of industrialization since 1840. *Prerequisite: Econ. 121, Econ. 122, History 132.*
- *Econ. 435 Economics of Resources (3+0)** 3 Credits Fall
Concepts of resources; interaction among resources, industrialization and economic development; theories and problems of conservation; emphasis on Alaska. *Prerequisite: Econ. 121, Econ. 122 or permission.*
- *Econ. 463 International Economics I (3+0)** 3 Credits Fall
Theories of international trade; international payments and the balance of payments; public and private control of trade international economic cooperation. *Prerequisite: Econ. 121, Econ. 122.*
- Econ. 464 International Economics II (3+0)** 3 Credits Spring
Analysis of international disequilibrium; capital flow and foreign investment; international liquidity creation and mutual assistance plans; problems and international aspects of policies of underdeveloped areas. *Prerequisite: Econ. 463.*
- Econ. 493 Special Topics** Arr. Fall
494 Arr. Spring
- Econ. 693 Special Topics** Arr. Fall
694 Arr. Spring

Econ. 691	Seminar in Economic Theory
692	
Econ. 697	Thesis
698	

Credits Arr.	Fall
Credits Arr.	Spring
Credits Arr.	
Credits Arr.	

EDUCATION

*Ed. 301	Social Studies for Elementary Teachers (3+0)	3 Credits	Fall
Methods and materials adaptable to modern curriculum in elementary social studies. Prerequisite: Ed. 313 and prerequisites thereto.			
*Ed. 302	Language Arts for Elementary Teachers (3+0)	3 Credits	Spring
Definition; role of language in children's learning; specific language skills to be taught in grades 1 through 8; methods and materials for effective teaching; organization for instruction; all aspects of the language arts, except reading. Prerequisite: Ed. 313 and prerequisites thereto.			
*Ed. 304	Literature for Children (3+0)	3 Credits	Spring
Criteria for evaluating children's books and application of criteria to books selected by student; history of children's literature; study of outstanding authors, illustrators and content of specific categories of literature; book selection aids and effective use of literature to promote learning. Prerequisite: Psy. 305 or permission of instructor.			
*Ed. 306	Teaching of Science in Elementary Schools (3+0)	3 Credits	Fall
Modern concepts, methods and materials of teaching science. Prerequisite: Ed. 313 and prerequisites thereto.			
*Ed. 307	Teaching of Arithmetic (2+0)	2 Credits	Spring
Present day concepts, methods and materials. Prerequisite: Math. 115 or Math. 121, Math. 205, and Ed. 313 and prerequisites thereto. In-service teachers may substitute Math. 345 for the math. prerequisites.			
*Ed. 311	Audio-Visual Methods and Materials (3+2)	3 Credits	Spring
Selection and use of audio-visual materials in teaching and learning at all levels of education. Prerequisite: Ed. 313 and prerequisites thereto.			
Ed. 313	Educational Psychology (3+0)	3 Credits	Fall & Spring
Application of principles of psychology to classroom teaching and learning. Prerequisite: Psy. 101 and Psy. 305 or Psy. 252.			
*Ed. 323	Small Schools (2+0)	2 Credits	
As demand warrants			
Basic for students planning to teach in small schools; special problems in organization and methods; small schools in Alaska serve as the focal point for discussion and instruction. Prerequisite: Ed. 313 and prerequisites thereto.			
*Ed. 332	Tests and Measurements (3+0)	3 Credits	Fall & Spring
Theory and practice of educational evaluation; emphasis on testing aspects most applicable for classroom teachers; construction of teacher-made tests; interpretation of teacher-made and standardized instruments emphasized. Not open to students having credit in Psy. 321. Prerequisite: Ed. 313 and prerequisites thereto.			
*Ed. 345	Sociology of Education (3+0)	3 Credits	Fall
Impact of culture on schools. Examination of contemporary social trends and relationships among church, school, government and family. Prerequisite: Soc. 101.			
*Ed. 348	History of Education in the United States (3+0)	3 Credits	Spring
Development of American Education as a facet of social and intellectual history. Prerequisite: Hist. 131 and 132.			
Ed. 402	Methods of Teaching (3+0)	3 Credits	Fall & Spring
Principles and methods of teaching management, routine, daily programs, etc. Prerequisite: 100 collegiate credits, Ed. 332 and prerequisites thereto.			
Ed. 406	Methods of Teaching Physical Education (3+0)	3 Credits	
As demand warrants			
Selection of materials and presentation methods for secondary school physical education. Prerequisite: 100 collegiate credits, Ed. 332 and prerequisites thereto.			

Ed. 407 Methods of Teaching Home Economics (3+0)

3 Credits

As demand warrants

Problems and methods in selecting and organizing materials for instruction; comparison and evaluation of methods, laboratory techniques, supplies, equipment; economy of time and materials. Admission by arrangement. *Prerequisite: 100 collegiate credits, Ed. 332 and prerequisites thereto.*

Ed. 408 Methods of Teaching Business Education (3+0)

3 Credits

As demand warrants

Organization and content of high school business education courses; equipping a business education department, including selection, care and maintenance; methods in teaching bookkeeping, typewriting, shorthand and transcription. Admission by arrangement. *Prerequisite: 100 collegiate credits, Ed. 332 and prerequisites thereto.*

***Ed. 409 The Teaching of Reading (3+0)**

3 Credits

Fall

Importance and nature of reading. Specific steps involved in the teaching of reading, word analysis, comprehension, interpretation, reading rate; new developments in reading instruction emphasizing appropriate materials. *Prerequisite: Ed. 313 and prerequisites thereto.*

***Ed. 421 Secondary Education (3+0)**

3 Credits

Fall

Development of a working concept of secondary education in the U.S., its history, objectives, curriculum, organization, practices and consideration of current issues. *Prerequisite: Ed. 313 and prerequisites thereto.*

***Ed. 422 Philosophy of Education (3+0)**

3 Credits

Fall

Basic philosophic concepts and their historical development; philosophy applied to education and related issues and problems; examinations of contributions of outstanding educators. *Prerequisite: Phil. 101.*

***Ed. 426 Principles and Practices of Guidance (3+0)**

3 Credits

Fall

Introduction to the philosophies, organization, patterns and tools and techniques that aid teachers and guidance personnel in preparing students for responsible decision making in modern society. *Prerequisite: Ed. 332 and prerequisites thereto.*

***Ed. 428 Occupational Information (3+0)**

3 Credits

As Demand Warrants

Principles and practices of vocational guidance; emphasis on sources of vocational information, its evaluation and use in educational and counseling situations. *Prerequisite: Ed. 426 and prerequisites thereto.*

Ed. 446 Public School Organization, Control, and Support (3+0)

3 Credits

As Demand Warrants

Fundamentals of public school organization, control and support. Relation of Federal, State, and local agencies. Problems incident to public school organization, control, and support in Alaska. *Prerequisite: Senior standing in education. Not open to students who took Ed. 442/542 before it was abolished.*

Ed. 452 Student Teaching (0+18)

6 Credits

Fall & Spring

Supervised teaching in elementary or secondary schools of Fairbanks or in a school approved by the Department of Education. The Department may limit registration, determine assignments, prescribe the number of teaching hours required and cancel the registration of students doing unsatisfactory work. *Prerequisite: See page for requirements for admission to student teaching. May be taken concurrently with Ed. 402.*

Ed. 461 Research

Credits Arr.

As demand warrants

On approval of the Head of the Education Department, fourth year students who show outstanding ability for individual study in education may undertake research during their final year.

Ed. 491 Seminar

Credits Arr.

As demand warrants

492

Credits Arr.

As demand warrants

Current topics in Education. Admission by permission of Head of the Department.

Ed. 493 Special Topics

Credits Arr.

Fall

494

Credits Arr.

Spring

Various subjects; principally directed study, discussion and research.

- Ed. 604 Diagnosis and Correction of Reading Deficiencies (3+0)** 3 Credits
As demand warrants
Nature of the reading process; emphasis on psychology involved in teaching reading difficulties; testing programs to ascertain specific disabilities in readiness, vocabulary, word-attack, comprehension, speed and accuracy; specific suggestions for their correction; newer approaches to teaching reading. *Prerequisite: Ed. 409 plus experience in the teaching of reading.*
- Ed. 620 Curriculum Development (3+0)** 3 Credits
As demand warrants
Basic definition of curriculum. Present need for curriculum improvement. Criteria for selection of broad goals. Types of curriculum framework examined. Consideration of the organization of specific learning experiences as part of the curriculum structure. *Prerequisite: Ed. 313 and graduate standing in education.*
- Ed. 623 Principles of Individual Counseling (3+0)** 3 Credits
As demand warrants
Counseling techniques and procedures in education, social work, and on a limited basis, clinical psychology; their applications by the classroom teacher and guidance specialist in assisting students with adjustment problems within a normal range. *Prerequisite: Ed. 426, Psy. 304 or 406 and permission of instructor.*
- Ed. 624 Group Counseling (3+0)** 3 Credits
As demand warrants
Kinds and types of groups with emphasis on methods, problems and needed skills in working with groups in a counseling situation. *Prerequisite: Ed. 426 and 623.*
- Ed. 627 Education Research (2+0)** 2 Credits Fall
Techniques on education research; selection topics and problems, data gathering, interpretation and preparation of reports.
- Ed. 629 Individual Tests of Intelligence (2+0)** 2 Credits
As demand warrants
Individual intelligence tests with emphasis on the revised Stanford-Binet Intelligence Scale and the Wechsler Intelligence Scales. *Prerequisite: Ed. 332 and permission of instructor.*
- Ed. 630 Laboratory in Individual Tests of Intelligence (0+6)** 2 Credits
As demand warrants
Provides laboratory experience in administration of the Revised Stanford-Binet Intelligence Scale or the Wechsler Intelligence Scales. *Prerequisite: Ed. 629 and permission of instructor.*
- Ed. 631 Advanced Educational Psychology: Developmental (3+0)** 3 Credits
As demand warrants
Stresses understanding of human emotional, mental, physical, and social development. Emphasis on individual differences. Assumes one previous course in human development, educational psychology, and teaching experience. *Prerequisite: Graduate standing.*
- Ed. 633 Organization, Administration and Supervision of Guidance of Guidance** 2 Credits
As demand warrants
For administrators, guidance personnel and others interested in developing or evaluating a guidance program; selection procedures and supervision of guidance personnel are considered. *Prerequisite: Ed. 426.*
- Ed. 634 Counseling Practicum (1+4)** 3 Credits Arr.
Provides supervised field experience, including preparatory activities in an educational setting. *Prerequisite: Approval of Head of Education Department; Ed. 426, Ed. 623, Psy. 304 or 406, Psy. 321.*
- Ed. 636 Advanced Public School Administration: Cases and Concepts (2+0)** 2 Credits
As demand warrants
Case study approach to public school administration; identification and analysis of basic issues and problems; identification of pertinent data and possible solutions. *Prerequisite: First course in public school administration.*
- Ed. 637 Public School Administration (3+0)** 3 Credits
As demand warrants
Responsibility pertaining to the organization of a school and the direction of personnel. Functions of instructional leadership. Public school administration as a career. Problems incident to public school administration in Alaska. *Prerequisite: Ed. 446 and graduate standing in Education.*

- Ed. 638 Supervision and Improvement of Instruction (3+0)** 3 Credits
As demand warrants
Development, purpose, organization of supervisory programs; special attention to current in-service education programs.
- Ed. 639 Public School Finance (3+0)** 3 Credits
As demand warrants
Contemporary basis for raising and distributing Federal, State and Local education funds; problems of school financing in Alaska. Open only to advanced students in education.
- Ed. 641 School Law (2+0)** 2 Credits
As demand warrants
Rights and responsibilities of teachers and pupils; rulings of the Attorney General; decisions of the courts, regulations of the State Board of Education. *Prerequisite: Graduate standing in education.*
- Ed. 691 Education Seminar** Credits Arr.
As demand warrants
692 Credits Arr.
As demand warrants
Current topics in education. Maximum credit allowed toward advanced degrees: 4 credits. *Admission by arrangement.*
- Ed. 693 Special Topics** Credits Arr. Fall
694 Credits Arr. Spring
Various subjects, principally by directed study, discussion and research. *Admission by arrangement. Prerequisite: Ed. 627 when taken as independent project in lieu of thesis.*
- Ed. 695 Research Education** Credits Arr. Fall
696 Credits Arr. Spring
Independent project in lieu of theses. *Admission by arrangement. Prerequisite: Ed. 627.*
- Ed. 697 Thesis** Credits Arr. Fall
698 Credits Arr. Spring
Offered as demand warrants. *Prerequisite: Ed. 627.*

ELECTRICAL ENGINEERING

- E.E. 102 Electrical Engineering Shop Practice (0+6)** 2 Credits Spring
Essentials of metal-working, use of hand and machine tools; chassis construction; wiring and soldering; construction of electronic equipment. Enrollment limited. *Prerequisite: Registration in electrical engineering or consent of the instructor.*
- E.E. 203 Electrical Engineering Fundamentals (3+3)** 4 Credits Fall
204 4 Credits Spring
Analysis of Alternating-current circuits using complex notation and phasor diagrams; resonance; transformers; Fourier analysis; the complex frequency plane; three-phase circuits. *Prerequisite: Math. 200.*
- E.E. 313 Elements of Electrical Engineering (2+3)** 3 Credits Fall
314 3 Credits Spring
Primarily for students of Civil, Mining, Mechanical and Chemical Engineering. Circuits, machines, electronics, instrumentation. *Prerequisite: Phys. 212.*
- E.E. 333 Electronics (3+3)** 4 Credits Fall
334 4 Credits Spring
Characterization of electronic devices including semiconductors and vacuum tubes. Theory and design of basic circuits including amplifiers, oscillators, rectifiers and detectors. *Prerequisite: E.E. 204. Offered in alternate years; next offered 1967-68.*
- E.E. 403 Machines and Power (3+3)** 4 Credits Fall
404 4 Credits Spring
Electrical machines, with introduction to power systems: D.C. and A.C. machines, including motors, generators, transformers, alternators, and selsyns; laboratory study of typical machine characteristics. *Prerequisite: E.E. 204. Offered in alternate years; next offered 1966-67.*

E.E. 432 Fields, Lines, and Antennas (3+3)	4 Credits	Spring
Use of Maxwell's equations in the analysis of waveguides, cavity resonators, and transmission lines; retarded potentials; antennas for radio and microwave frequencies. <i>Prerequisite: Math. 302, Phys. 331. Offered in alternate years; next offered 1966-67.</i>		
E.E. 435 Advances in Electronics (3+3)	4 Credits	Fall
Additional topics in electronics to extend and broaden the student's background; new developments. <i>Prerequisite: E.E. 334. Offered in alternate years; next offered 1966-67.</i>		
E.E. 442 Digital Computers (4+0)	4 Credits	Fall
Design and functioning of digital computers; system organization, programming, computer arithmetic, combinational and sequential circuits, methods of control, electronic circuitry. <i>Prerequisite: Upper-division standing in electrical engineering, mathematics, or physics, or consent of instructor. Offered in alternate years; next offered 1967-68.</i>		
E.E. 453 Circuit Theory (4+0)	4 Credits	Fall
454	4 Credits	Spring
Transient analysis, Fourier Analysis, network theorems, transmission lines, filters; circuit analysis by the Laplace Transform; theory of servomechanisms. <i>Prerequisite: E.E. 204, credit or registration in Math. 302. Offered in alternate years; next offered 1967-68.</i>		
E.E. 462 Communication Systems (3+3)	4 Credits	Spring
Theory and practice of communications systems; essentials of information theory; operation and maintenance of typical equipment. <i>Prerequisite: Credit or registration in E.E. 334 and E.E. 432.</i>		
E.E. 471 Control (3+3)	4 Credits	Fall
Theory and practice of automatic control systems. Characterization and stability of feedback systems. Root locus, Nyquist and Bode diagrams. Transducers. <i>Prerequisite: E.E. 204, 454. Offered in alternate years; next offered 1966-67.</i>		
E.E. 484 Design of Electrical Systems (1+6)	3 Credits	Spring
The design process; class will design a simple system with attention to capability, reliability, cost. <i>Prerequisite: Upper-division standing. Offered in alternate years; next offered 1967-68.</i>		
E.E. 491 Seminar (1+0)	1 Credit	Fall
492	1 Credit	Spring
Current topics. Students will have an opportunity to present papers. <i>Prerequisite: Senior standing in electrical engineering.</i>		
E.E. 493 Special Topics	Credits Arranged	Fall
494	Credits Arranged	Spring
Various subjects studied.		
E.E. 693 Special Topics	Credits Arranged	Fall
694	Credits Arranged	Spring

ELECTRONICS TECHNOLOGY

The first course in electricity for electronics technicians. Basic physics, electrical terms and units, meters and their use, resistance, Ohm's law, simple circuits, magnetic fundamentals, batteries, Kirchhoff's laws, DC circuit analysis, inductance, capacitance. Principles of alternating current, vectors, phase relationships, inductive and capacitive reactance and impedance, AC circuit analysis, series and parallel resonant circuits, transformers, Thevenin's equivalent circuit.

E.T. 51 DC Circuits (5+12)	4 Credits	Fall
E.T. 52 DC Circuits (5+12)	4 Credits	Fall
E.T. 55 Electronics Practice I (0+12)	3 Credits	Fall
Electronic drawings, soldering, electrical connections, use of hand tools, preparation for license examinations, layout and assembly of audio-frequency equipment, operation of transmitters and receivers, troubleshooting, practical aspects of electronics.		
E.T. 59 Mathematics for Electronics (5+3)	5 Credits	Fall
Review of arithmetic. Selected topics in algebra, trigonometry, slide-rule, computation, graphs, analytical geometry, waveform analysis, decibel calculations. Applications to electronics. <i>Prerequisite: High school mathematics.</i>		

- E.T. 61 Tubes and Semiconductors** 4 Credits Spring
62 Electronic Circuits I (8+15) 3 Credits Spring
63 Electronic Systems I 4 Credits Spring
- Vacuum tubes, semiconductors, transistors. Fundamentals, construction, characteristics, parameters, specifications.
 Power supplies, basic amplifiers, loudspeakers, microphones and pickups, basic oscillators. The radio transmitter; transmission, reception and detection of radio waves; antennas and transmission lines; the radio receiver; special receiver circuits; frequency-modulated transmitters and receivers; transistor applications; single-sideband communications. *Prerequisites: E.T. 51, 52, 59.*
- E.T. 66 Electronics Practice II (0+12)** 3 Credits Spring
 Layout and assembly of radio-frequency equipment, practical aspects of electronics, alignment and repair procedures, practical experience in electronics, use of test equipment, preparation for license examinations. *Prerequisite: E.T. 55.*
- E.T. 71 Electronic Circuits II** 5 Credits Summer
72 Electronic Circuits III (10+15) 4 Credits Summer
75 Microwave Electronics 4 Credits Summer
- Nonsinusoidal waveshapes, multivibrators, blocking and shock-excited oscillators, wave-shaping, circuits, limiters, clippers, counters, sweep-generator circuits, special power supplies, systems, transistor applications, television transmitters and receivers.
 Microwaves; microwave oscillators, transmitters, duplexers, antennas, amplifiers, mixers, receivers; multiplexing. *Prerequisites: E.T. 61, 62, 63.*
- E.T. 77 System Maintenance (0+12)** 4 Credits Summer
 Principles and practice of system maintenance. Experience with a system, such as a transmitter or carrier communications system, including work with system drawings, the logbook, routine maintenance, and repair of troubles. *Prerequisite: Registration or credit in E. T. 71, 72, 75.*
- E.T. 83 Test Instruments (3+3)** 3 Credits Fall
 Use, theory, and limitations of electronic test instruments including multimeter, vacuum-tube voltmeter, oscilloscope, bridges, swept-frequency RF generator, digital voltmeter, counter. Procedures for VSWR, noise figure, gain, band width. *Prerequisite: E.T. 72, 75.*
- E.T. 84 Electronic Systems II (5+3)** 5 Credits Fall
 Organization, functioning and maintenance of large electronic systems such as radars and computers. *Prerequisite: E.T. 72, 75.*

ENGINEERING MANAGEMENT

- E.M. 401 Construction Cost Estimating and Bid Preparation (3+0)** 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. May be offered for graduate credit.
- E.M. 604 Arctic Engineering (3+0)** 3 Credits Spring
 Application of engineering, scientific and mathematic fundamentals to problems of advancing civilization in Arctic regions. Logistics for Arctic operations, foundations on ice and frozen ground, thermal aspects of structures and materials, Arctic transport and communication, heating and ventilating Arctic installations. Specialty will be guest lecturers.
- E.M. 605 Advanced Engineering Economy (3+0)** 3 Credits Fall
 The science of fiscal decision making. Graduate level studies in problems of replacement, economic selections, income tax accounting, engineering evaluation and introduction to the problems of depreciation.
- E.M. 611 Engineering Management (3+0)** 3 Credits Fall
 Review of accounting principles; industrial accounting including cost accounting; business organization; business finance; emphasis on use of data in management rather than its generation.
- E.M. 612 Engineering Management (3+0)** 3 Credits Spring
 Development of ability to seek out needed information, analyze it, and make recommendations over a wide range of managerial problems involving fiscal matters; cases involving capital acquisitions, profit maximization, methods improvement, pricing, modification of controls, and other management problems. *Prerequisite: E.M. 611 and E.M. 605.*

- E.M. 613 Engineering Management (3+0)** 3 Credits Spring
Human element in management; labor relations, human relations, personnel administration, industrial psychology, employee relations, and labor economics from the viewpoint of needs of a manager.

ENGINEERING SCIENCES

- E.S. 101 Graphics (0+6)** 2 Credits Fall
102 2 Credits Spring
Fall Semester: Orthographic projection, pictorial drawing, sketching, lettering, geometric construction. Charts, graphs and diagrams.
Spring Semester: Descriptive geometry; graphic solution of 3 dimensional problems.
- E.S. 111 Engineering Science (2+3)** 3 Credits Fall
112 3 Credits Spring
Engineering problem solving with emphasis on the statics, kinematics and dynamics of engineering systems. Conservation laws, fluid mechanics and heat. *Prerequisite:* Credit or registration in Math. 106 (fall) and Math. 200 (spring).
- E.S. 207 Measurements (2+3)** 4 Credits Fall
Theory of measurement, precision, dispersion, distribution of error; with practice problems taken from various fields of engineering. *Prerequisite:* E.S. 112.
- E.S. 208 Mechanics (3+3)** 4 Credits Spring
Statics, kinematics, dynamics. Both classical and vector methods are used. Graphical solutions, work and energy, impulse and momentum, virtual work. *Prerequisites:* E.S. 122 and Math 200.
- E.S. 331 Mechanics of Materials (2+3)** 3 Credits Fall
Stress-strain relationships, shear and moment diagrams, design of beams, columns, rivet, bolt, and weld connections, indeterminate beams. *Prerequisites:* E.S. 208, Math. 201.
- E.S. 341 Fluid Mechanics (3+3)** 4 Credits Fall
Statics and dynamics of fluids. Basic equations of hydrodynamics, dimensional analysis, simple hydraulic machinery. *Prerequisite:* E.S. 208, Math. 201.
- E.S. 346 Basic Thermodynamics (3+0)** 3 Credits Spring
Systems, properties, processes and cycles. Fundamental principles of thermodynamics (first and second laws), elementary applications. *Prerequisite:* Math. 202, Phys. 212.
- E.S. 450 Engineering Management and Operations (3+0)** 3 Credits Spring
Fundamentals of Engineering Economy; contracts, specifications, legal and ethical principles, management. *Prerequisite:* Senior standing or permission.
- E.S. 491 Engineering Seminar** Credits Arr. Fall or Spr.
492 Credits Arr. Fall or Spr.
Oral and written exposition on current engineering topics.

ENGLISH

- Engl. 1 Elementary English (3+0)** 0 Credits Fall-Spring
For students inadequately prepared for English 101. Intensive practice in written and oral comprehension. Frequent writing assignments.
- Engl. 3 Laboratory in Usage (1+2-4)** 0 Credits Fall-Spring
- Engl. 68 Elementary Exposition** 3 Credits Fall or Spring
Training in oral and written communication.
- Engl. 101 Composition and Modes of Literature (3+0)** 3 Credits Fall or Spring
102 3 Credits Fall or Spring
Intensive instruction in orderly thought, clear expression, and analysis of creative literature.
- Engl. 201 Masterpieces of World Literature (3+0)** 3 Credits Spring
202 3 Credits Fall
Masterworks of literature, studied to acquire a broad background and develop standards of literary judgment. *Prerequisite:* 101 and 102.

- Engl. 213 Advanced Exposition (1+2)** 3 Credits Fall-Spring
Clarity and vigor in written communication of facts and ideas. Principles of style and methods of exposition. Students write for individual weekly conferences. *Prerequisite: Engl. 102.*
- Engl. 239 Forms and Techniques of Poetry (3+0)** 3 Credits Fall
Devices, esthetic and criticism of verse composition. *Prerequisite: Engl. 101 and 102.*
- Engl. 240 Form and Technique of Fiction (3+0)** 3 Credits Spring
Devices, esthetic and criticism of prose composition. *Prerequisite: Engl. 101 and 102.* EXCEPT WHERE OTHERWISE INDICATED, PREREQUISITES FOR 300 and 400 LEVEL COURSES ARE ENGLISH 201 or 202, AND ENGLISH 239 or 240 OR INSTRUCTOR'S PERMISSION.
- *Engl. 314 Research Writing (3+0)** 3 Credits Spring
Organizing reports, documenting research, language and style in scholarly articles. Papers in students' fields prepared for conference and class. *Prerequisite: Engl. 213 or by arrangement.*
- Engl. 321 The Renaissance (3+0)** 3 Credits Fall
Poetry and prose of the sixteenth century. *Next offered 1966-67.*
- Engl. 322 Neoclassical Age (3+0)** 3 Credits Spring
Poetry and prose from Samuel Butler through Samuel Johnson. Impact of intellectual, religious, and political controversies on the literature of the period. *Next offered 1966-67.*
- Engl. 323 Romantic Period (3+0)** 3 Credits Fall
Poetry and prose from the late 1700's to 1830. *Next offered 1967-68.*
- Engl. 324 Victorian Period (3+0)** 3 Credits Spring
Poetry and non-fictional prose, 1830-1902. *Next offered 1967-68.*
- Engl. 328 19th Century American Prose (3+0)** 3 Credits Fall
The works of Emerson, Hawthorne, Melville, Adams, Twain, Howell and James. *Next offered 1966-67.*
- Engl. 336 20th Century American Prose (3+0)** 1-3 Credits Fall-Spring
The major fiction of Lewis, Fitzgerald, Hemingway, Faulkner, and Steinbeck.
- Engl. 337 20th Century American Poetry (3+0)** 3 Credits Fall
The poetry of Whitman, Dickinson, Robinson, Frost, Stevens, Roethke and others. *Next offered 1967-68.*
- Engl. 341 20th Century British Literature (3+0)** 3 Credits Fall
Major achievements of modern British poetry and prose. *Next offered 1967-68.*
- Engl. 342 20th Century Drama (3+0)** 3 Credits Spring
From Chekhov to Ionesco, the major dramatists and their achievements. *Next offered 1967-68.*
- Engl. 352 The British Novel to 1900 (3+0)** 3 Credits Spring
Origin and development of the novel with concentration on Richardson, Fielding, Austen, E. Bronte, Dickens, Conrad and Hardy. *Next offered 1967-68.*
- Engl. 413 Old and Middle English Literature (3+0)** 3 Credits Spring
Old English literature in translation; representative Middle English texts exclusive of Chaucer. *Next offered 1966-67.*
- *Engl. 421 Chaucer** 3 Credits Fall
Chaucer's poetry, with emphasis on *The Canterbury Tales.*
- Engl. 423 Elizabethan Drama (3+0)** 3 Credits Fall
Major plays of Elizabethan dramatists and the early plays of Shakespeare.
- Engl. 424 Shakespeare (3+0)** 3 Credits Spring
Major works, emphasis on the later plays and review of Shakespearean criticism.
- Engl. 431 Creative Writers Workshop (3+0)** 1-3 Credits Fall
432 1-3 Credits Spring
Writing fiction and poetry. Critique of student productions.
- Engl. 443 Greek and Roman Literature (3+0)** 3 Credits Fall
Greek and Roman literature in English translation. *Next offered 1967-68.*

Engl. 444 European Literature (3+0)	3 Credits	Fall-Spring
Studies in major European writers and periods.		
*Engl. 472 History of English Language (3+0)	3 Credits	Spring
Origin and development of the English language; modern syntax and usage.		
Engl. 493 Special Topics (3+0)	3 Credits	Fall
494	3 Credits	Spring
Various subjects in American, British and comparative literature.		
Engl. 605 Studies in Drama (3+0)	3 Credits	Fall
Engl. 610 Studies in Fiction (3+0)	3 Credits	Spring
Engl. 615 Studies in Poetry (3+0)	3 Credits	Fall
Engl. 620 Studies in Criticism (3+0)	3 Credits	Spring
Engl. 625 Studies in Middle English Literature (3+0)	3 Credits	Fall
Engl. 630 Studies in Literature of the English Renaissance (3+0)	3 Credits	Spring
Engl. 635 Studies in 17th Century English Literature (3+0)	3 Credits	Fall
Engl. 640 Studies in 18th Century English Literature (3+0)	3 Credits	Spring
Satire		
Engl. 645 Studies in the Literature of the British (3+0)	3 Credits	Fall
Romantic Period		
Engl. 650 Studies in the Literature of the Victorian Period (3+0)	3 Credits	Spring
Engl. 655 Studies in 20th Century British Literature (3+0)	3 Credits	Fall
Engl. 660 Studies in 20th Century American Literature (3+0)	3 Credits	Spring
Engl. 665 Studies in 19th Century American Literature (3+0)	3 Credits	Fall
Engl. 670 Studies in Comparative Literature (3+0)	3 Credits	Spring
Engl. 697 Thesis	Credits Arr.	Fall
698	Credits Arr.	Spring

WRITERS' WORKSHOP

Engl. 675 Writing Drama	Credits Arr.	Fall-Spring
Engl. 681 Writing Fiction	Credits Arr.	Fall-Spring
Engl. 685 Writing Verse	Credits Arr.	Fall-Spring

FRENCH

Fren. 101 Elementary French (5+0)	5 Credits	Fall
102	5 Credits	Spring
Designed to teach students to hear, speak, read and write French. Oral practice is emphasized.		
Fren. 150 Scientific French (3+0)	3 Credits	Spring
Rapid acquisition of a reading knowledge of scientific French. <i>Offered as demand warrants.</i>		
Fren. 201 Intermediate French (3+0)	3 Credits	Fall
202	3 Credits	Spring
A continuation of French 102. Increasing emphasis on reading ability and cultural material. Conducted in French. <i>Prerequisite: French 102 or 2 years of high school French.</i>		
Fren. 311 Survey of French Literature (3+0)	3 Credits	Fall
312	3 Credits	Spring
Representative masterpieces from the beginnings to the twentieth century. Lectures in French. <i>Prerequisite: French 202 or equivalent. Offered as demand warrants.</i>		

- *Fren. 321 Studies in French Literature (3+0)** 3 Credits Fall
322 3 Credits Spring
 Choice of authors, genres, or periods of French literature for intensive study. *Prerequisite: French 202 or equivalent. Students may repeat course for credit when topic varies.*
- *Fren. 452 The French Novel of the 20th Century** 3 Credits Spring
 Representative novelists and their works. *Offered as demand warrants.*
- *Fren. 493 Special Topics** Credits Arr. Fall
494 Credits Arr. Spring
 Various subjects for advanced students. Admission by arrangement. *Offered as demand warrants.*

GEOGRAPHY

- Geog. 101 Introductory Geography (3+0)** 3 Credits Fall
 World regions; an analysis of environment.
- Geog. 201 Elements of Physical Geography (3+0)** 3 Credits Fall
 Description of physical environment and introduction to techniques of geographic analysis. *Prerequisite: Geog. 101.*
- *Geog. 302 Geography of Alaska (3+0)** 3 Credits Spring
 Regional geography of Alaska. *Prerequisite: Geog. 101 or Junior standing.*
- Geog. 316 Pleistocene Environment (3+0)**
 Introduction to American prehistory. Environment during the late Ice Age and early Post-glacial times. Glaciations, land bridges, perennially frozen ground, and the Mackenzie Corridor problem in detail. *Prerequisite: Geog. 101.*
- *Geog. 327 Cold Lands (3+0)** 3 Credits Fall
 Climate, natural resources and man's adjustment to environment in cold lands. *Prerequisite: Anth. 101, or by permission.*
- Geog. 401 Weather and Climate (3+0)** 3 Credits Fall
 Introduction to the study of weather and the classification of climates. *Prerequisite: Geog. 201.*
- Geog. 402 Man and Nature (3+0)** 3 Credits Spring
 Detailed analysis of the interrelationships of man and environment with particular emphasis on the Arctic. *Admission by arrangement.*
- Geog. 491 Seminar** Credits Arr. Fall
492 Credits Arr. Spring
 Selected topics in Geography. *Admission by arrangement.*
- *Geog. 493 Special Topics** Credits Arr. Fall
494 Credits Arr. Spring
 Various subjects studied. *Admission by arrangement.*

GEOLOGY

- Geol. 101 General Geology (3+3)** 4 Credits Fall
 Introduction to physical geology; a study of the earth, its materials, and the processes that effect changes upon and within it. Laboratory training in the use of topographic maps and the recognition of common rocks and minerals.
- Geol. 102 Historical Geology (3+3)** 4 Credits Spring
 Summary of the history of the earth from the earliest stages to the present; sequence of geologic events and succession of life forms. Laboratory work includes the reconstruction of geologic history of various regions through use of geologic maps and structure sections; *Prerequisite: Geol. 101.*
- Geol. 104 Elements of Geology (3+0)** 3 Credits Evening
 A non-laboratory introduction to physical and historical geology; the earth, its origin, processes that affect it, sequence of events in its evolution and succession of life on it; appreciation of the modern landscape. Not acceptable toward a degree in geology or fulfilling a laboratory science requirement.

- Geol. 213 Mineralogy (3+6)** 5 Credits Fall
Introduction to mineral chemistry, atomic structure, elementary crystallography, and descriptive and determinative mineralogy. Includes introduction to instrumental determinative techniques (x-ray, spectroscopy), simple qualitative chemical tests, and the theory and use of the petrographic microscope. May be taken for 4 credits by arrangement. *Prerequisites:* Math. 106, 200. Chem. 101, 102.
- Geol. 214 Petrology (3+6)** 5 Credits Spring
Mineralogy and chemical composition, genesis and identification of igneous, metamorphic and sedimentary rocks. Laboratory work is based on study of paired hand specimens and thin section. *Prerequisite:* Geol. 213.
- Geol. 304 Geomorphology (2+3)** 3 Credits Spring
Study of land forms and processes which create and modify them. Laboratory and field study of physiographic features. (Field trips.) *Prerequisite:* Geol. 102.
- Geol. 314 Structural Geology (2+3)** 3 Credits Spring
Origin and interpretation of primary and secondary geologic structures. Graphical solution of structural problems. (Field trips.) *Prerequisites:* Geol. 101, recommended, Geol. 102, E. S. 112, Phys. 103, or by arrangement.
- Geol. 321 Principles of Sedimentation (2+3)** 3 Credits Spring
Sources of materials, sedimentary and diagenetic processes, classification. *Prerequisites:* Geol. 213.
- Geol. 351 Field Geology** 8 Credits Summer
Practical experience in the procedures employed in collecting and presenting the basic data obtained from the field. Includes field mapping on topographic maps, aerial photographs, plane table maps, and presentation of results in a professional report and finished geologic map. *Prerequisite:* Junior status in geology.
Students pay own transportation, subsistence, and course tuition fee. Entrance by pre-registration only.
- *Geol. 400 Earth Sciences Journal Club (1+0)** No Credits Fall & Spring
Attendance required by upper division geology majors and graduate students.
- Geol. 401 Invertebrate Paleontology (3+3)** 4 Credits Fall
Paleontological theory and practice. Systematic study of fossil invertebrates. *Prerequisite:* Geol. 101, recommended Biol. 305 (Invertebrate Zool.).
- *Geol. 402 Principles of Stratigraphy (2+3)** 3 Credits Fall or Spring
The history of the development of stratigraphy, its principles and application. *Prerequisites:* Geol. 101, recommended Geol. 321, 401.
- *Geol. 406 Ore Deposits (3+0)** 3 Credits Fall
Form, structure, mineralogy, petrology, and mode of origin of ore deposits. (Field trips.) *Prerequisites:* Geol. 214, 314.
- *Geol. 408 Map Interpretation (1+9)** 4 Credits Fall or Spring
Topographic maps in interpretation of geologic structures, analysis of local and regional geomorphic development. *Prerequisite:* Geol. 304.
- *Geol. 410 Micropaleontology (2+3)** 3 Credits Fall or Spring
Microfossils and their use in stratigraphic correlation. *Prerequisite:* Geol. 102. *Offered as demand warrants.*
- *Geol. 412 Geology of Alaska (2+3)** 3 Credits Fall or Spring
Study and interpretation of the geology of Alaska. (Field trips.) *Prerequisites:* Geol. 102, 314, 304. *Offered as demand warrants.*
- *Geol. 413 Vertebrate Paleontology (2+3)** 3 Credits Fall
Systematic study of the fossil vertebrates with emphasis on evolution, morphology and ecology. (Field trips.) *Prerequisite:* Geol. 102.
- *Geol. 415 Geology and Engineering (3+0)** 3 Credits Fall
Problems of Frozen Ground
Geological and engineering importance of seasonally and perennially frozen ground (permafrost). Properties, distribution, origin of ice in the ground and its application to engineering and land utilization problems in the northern States, Canada, and Alaska. (Field trips.) *Prerequisites:* Geol. 101, Phys. 111.
- Geol. 416 Introduction to Geochemistry (3+0)** 3 Credits Spring
Introduction to chemistry of the earth. *Prerequisites:* Chem. 101, 102.

- Geol. 421 Principles of Seismology (3+0)** 3 Credits Fall
Historical introduction, observational seismology, seismotry, simple elastic wave propagation. *Admission by arrangement.*
- Geol. 491 Seminar in Geology** Credits Arr. Fall
492 Seminar in Geology Credits Arr. Spring
Various subjects studied. *Admission by arrangement.*
- Geol. 493 Special Topics—Problems in Various Fields of Geology** Credits Arr. Fall
494 Special Topics—Problems in Various Fields of Geology Credits Arr. Spring
Geologic problems of the student's choice approved by instructor. Transportation expenses met by student. No more than 3 credits allowed per semester. *Admission by arrangement.*
- Geol. 605 Glacial Geology I (2+3)** 3 Credits Fall
Phase relations between solid liquid and vapor states, supercooling, nucleation and freezing of water in all environments; lakes, rivers, oceans, atmosphere, soil, rock, and plant and animal tissue. Diagenetic processes in snow cover, densification of snow to glacier ice. Laboratory and field work. *Admission by arrangement.*
- Geol. 606 Glacial Geology II (2+3)** 3 Credits Spring
Physical properties of ice from various environments including seasonal and perennially frozen ground. Glaciers, distribution, classification, heat and temperature relations and glacier flow. Glaciation—alpine and continental. Laboratory and field work. *Admission by arrangement.*
- Geol. 608 Seminar in Pleistocene Environment (1+0)** 1 Credit Spring
Discussion of glaciations, land bridges, Mackenzie Corridor problem, permafrost in relation to biogeography including coming of man. Faculty panel of geologists, glaciologists, anthropologists, biologists, and botanists. *Prerequisite: Geol. 304, 605, 606, or by arrangement. One seminar. Offered as demand warrants.*
- Geol. 611 Stratigraphic Paleontology (2+3)** 3 Credits Fall
(Paleozoic)
North American index fossils and stratigraphy of North America and Europe. *Prerequisite: Geol. 401, 402. Offered in alternate years; next offered 1967-68.*
- Geol. 612 Stratigraphic Paleontology (2+3)** 3 Credits Spring
(Mesozoic and Cenozoic)
North American index fossils and stratigraphy of North America and Europe. *Prerequisites: Geol. 401, 402. Offered in alternate years; next offered 1967-68.*
- Geol. 622 Advanced Metamorphic Petrology (2+6)** 4 Credits Spring
Prerequisite: Geol. 214, 321. Offered in alternate years; next offered 1967-68.
- Geol. 624 Advanced Igneous Petrology (2+6)** 4 Credits Spring
Prerequisite: Geol. 214, 321. Offered in alternate years; next offered 1966-67.
- Geol. 627 Advanced Structural Geology I (3+0)** 3 Credits Spring
Large scale structural features, time and place in orogenesis, theories of orogenesis. *Prerequisite: Geol. 314. Offered in alternate years; next offered in 1966-67.*
- Geol. 628 Advanced Structural Geology II (3+0)** 3 Credits Spring
Structural petrology, mechanisms of folding, theoretical basis for mechanical behavior of rocks. *Prerequisite: Geol. 214, 314. Offered in alternate years; next offered in 1967-68.*
- Geol. 693 Special Topics** Credits Arr. Fall
694 Credits Arr. Spring
Research in various fields.
- Geol. 697 Thesis or Dissertation** Credits Arr. Fall
698 Credits Arr. Spring
By arrangement. Transportation expenses met by the student.

GERMAN

- Ger. 101 Elementary German (5+0)** 5 Credits Fall
102 5 Credits Spring
Designed to teach students to hear, speak, read and write German. Oral practice emphasized.
- Ger. 150 Scientific German (3+0)** 3 Credits Spring
Rapid acquisition of a reading knowledge of scientific German. *Offered as demand warrants.*
- Ger. 201 Intermediate German (3+0)** 3 Credits Fall
202 3 Credits Spring
Continuation of German 102. Increasing emphasis on reading ability and cultural material. Conducted in German. *Prerequisite: German 102 or 2 years of high school German.*
- *Ger. 321 Studies in German Literature (3+0)** 3 Credits Fall
322 3 Credits Spring
Choice of authors, genres, or periods of German literature for intensive study. *Prerequisite: German 202 or equivalent. Students may repeat course for credit when topic varies.*
- *Ger. 493 Special Topics** Credits Arr. Fall
494 Credits Arr. Spring
Various subjects in German. Designed for advanced students. *Admission by arrangement. Offered as demand warrants.*

HISTORY

- Hist. 117 Formation of European Civilization (3+0)** 3 Credits Fall
Political, economic and social history of Europe from the late Roman Empire to the Reformation.
- Hist. 118 Development of Modern Europe (3+0)** 3 Credits Spring
Political, social, economic and cultural history of Europe from 1500 to the present. Evolution of nationalism, democracy; their interrelationship with the Industrial Revolution.
- Hist. 131 History of the U. S. (3+0)** 3 Credits Fall
132 3 Credits Spring
Fall semester: The discovery of America to 1865; colonial period, Revolution, formation of the Constitution, western expansion, Civil War.
Spring Semester: From the Reconstruction to the present.
- Hist. 221 English History (3+0)** 3 Credits Fall
222 3 Credits Spring
Fall semester: Pre-Roman Britain to the end of the Puritan Revolution, emphasizing constitutional developments.
Spring semester: From the Restoration of 1660 to the present, emphasizing social and economic developments.
Offered in alternate years; next offered in 1966-67.
- Hist. 225 Ancient History (3+0)** 3 Credits Fall or Spring
Political, social, economic and cultural development of the ancient Near East, Greece and Rome.
- Hist. 254 History of Canada (3+0)** 3 Credits Fall or Spring
The French foundation to the establishment of dominion status, relations with the U.S. and British Commonwealth of nations. *Offered as demand warrants.*
- Hist. 261 Russian History (3+0)** 3 Credits Fall
Origins of Russia. Kievan Russia. The Mongol Era and the Rise of Muscovy. Early modern Russia.
- Hist. 262 Russian History (3+0)** 3 Credits Spring
The Romanoffs and the Development of the Russian Empire; the Petrine Reforms; the Great Reform of the 19th Century; revolutionary movements; Strains and stresses in Tsarist Russia. *Offered in alternate years. Next offered 1967-68.*

- *Hist. 302 The Old Regime, the Enlightenment (3+0) and the French Revolution** 3 Credits Fall
The political, social and economic structure of the Old Regime; intellectual developments in the 18th century; the Revolution and the Napoleonic period; influence of France upon European development in the 18th century. *Prerequisite: Hist. 118.*
- *Hist. 305 Europe: 1815 to 1870 (3+0)** 3 Credits Fall or Spring
Political, economic, social, and intellectual history. Development of Industrial Revolution, romantic movement and unification of Germany and Italy. *Prerequisite: Hist. 118. Offered in alternate years; next offered 1967-68.*
- *Hist. 306 Europe: 1870 to 1914 (3+0)** 3 Credits Fall or Spring
Continuation of Hist. 305. The rise of socialism, imperialism, outbreak of World War I. *Prerequisite: Hist. 118.*
- *Hist. 315 Contemporary Europe (3+0)** 3 Credits Fall or Spring
Europe from 1914 to the present. *Prerequisite: Hist. 117, Hist. 118 or by arrangement. Offered in alternate years; next offered 1966-67.*
- Hist. 341 History of Alaska (3+0)** 3 Credits Fall
The Russian background; acquisition, settlement, and development of Alaska as an American territory and the 49th state. *Prerequisite: Junior standing.*
- *Hist. 344 The Soviet Union (3+0)** 3 Credits Fall or Spring
Origin and development of the Soviet Union from the Revolution of 1917 to the present day; stages of economic development; Soviet government and the Communist Party. *Prerequisite: Hist. 118 or Hist. 261 or by permission. Offered in alternate years; next offered 1967-68.*
- *Hist. 363 The Far East in Modern Times (3+0)** 3 Credits Fall or Spring
Nations of eastern Asia; their relations with the West since the early nineteenth century. *Prerequisite: Admission by arrangement. Offered in alternate years; next offered 1967-68.*
- *Hist. 416 The Renaissance (3+0)** 3 Credits Fall or Spring
Political, social, economic, and cultural developments in the Age of the Renaissance. *Prerequisite: Hist. 117, Hist. 118. Offered in alternate years; next offered 1966-67.*
- *Hist. 430 American Colonial History (3+0)** 3 Credits Fall or Spring
Early America; European settlement; economic and social development of the American community; establishment of political independence. *Prerequisite: Hist. 131, Hist. 132. Offered in alternate years; next offered 1967-68.*
- *Hist. 435 Civil War and Reconstruction (3+0)** 3 Credits Fall or Spring
Political, economic, social, and diplomatic history from 1860-77; disruption and reestablishment of the Union. *Prerequisite: Hist. 131, Hist. 132. Offered in alternate years; next offered 1966-67.*
- *Hist. 440 The Westward Movement (3+0)** 3 Credits Fall or Spring
Westward migration; establishment of new states and political institutions. Influences of the West. *Prerequisite: Hist. 131, Hist. 132. Offered in alternate years; next offered 1967-68.*
- *Hist. 450 Twentieth Century America (3+0)** 3 Credits Fall or Spring
United States from the Progressive Movement to the present day, with emphasis on domestic developments. *Prerequisite: Hist. 131, Hist. 132. Offered in alternate years; next offered 1966-67.*
- *Hist. 451 Twentieth Century American Diplomacy (3+0)** 3 Credits Fall or Spring
Foreign relations from the United States' rise to world power through the Eisenhower administration. *Prerequisite: Hist. 131, Hist. 132. Offered in alternate years; next offered 1967-68.*
- *Hist. 461 American Intellectual and Cultural History (3+0)** 3 Credits Fall
462 3 Credits Spring
Lectures, readings, discussion. Examination of the development of American thought, including the transfer and modification of European ideas and the influence of American conditions on popular attitudes and culture. The semester division comes at approximately 1865. *Prerequisite: Hist. 131, Hist. 132. Offered in alternate years; next offered 1966-67.*
- *Hist. 475 Introduction to Historical Method (3+0)** 3 Credits Fall or Spring
Methods of historical research. Preparation and criticism of student research papers on selected topics. *Admission by arrangement.*

*Hist. 493 Special Topics	Credits Arr.	Fall
494	Credits Arr.	Spring
Hist. 601 Historiography (3+0)	3 Credits	Fall or Spring
History of historical writing. Study and analysis of works of selected major historians.		
Hist. 691 Seminar in European History (3+0)	3 Credits	Fall or Spring
Hist. 692 Seminar in American History (3+0)	3 Credits	Fall or Spring
Hist. 693 Special Topics	Credits Arr.	Fall
694	Credits Arr.	Spring
Hist. 697 Thesis	Credits Arr.	Fall
698	Credits Arr.	Spring

HOME ECONOMICS

H.E. 102 Meal Management (2+3)	3 Credits	Fall or Spring
Planning, buying, preparing and serving meals. Emphasis on management, cost, nutrition.		
H.E. 113 Clothing Construction and Selection (1+6)	3 Credits	Fall or Spring
Fundamental sewing processes in garment construction, using modern techniques. Clothing selection and wardrobe study and the psychological and social significance.		
H.E. 121 Related Art (1+3)	2 Credits	Fall
122	2 Credits	Spring

Practice in creative design to understand, appreciate and apply art principles in everyday life. Home furnishing is included in the second semester.

H.E. 211 Textiles (2+3)	3 Credits	Fall
Identification, structure, selection, use, care of fabrics.		

H.E. 236 Marriage and Family Life (3+0)	3 Credits	Fall or Spring
Preparation for marriage and family life; personality development, dating, courtship, engagement, morality, reproduction, conflicts, money matters, crises, divorce, religion, parenthood and other topics.		

H.E. 241 Home Management Residence	3 Credits	Fall or Spring
Complete responsibility for a home with an opportunity to be creative and to experiment. Credit depends on the time of residence in the University Home Management house. Admission by arrangement.		

H.E. 242 Household Equipment (2+3)	3 Credits	Fall or Spring
Selection, operation, care and efficient arrangement of household equipment for family use. Offered as demand warrants.		

H.E. 302 Advanced Foods (2+3)	3 Credits	Fall or Spring
Food selection and preparation based on composition, nutrition and basic scientific principles and comparison of methods. Food preservation. Prerequisite: 3 hours of Biol. and 3 hours of Chem.		

*H.E. 304 Nutrition (3+0)	3 Credits	Fall or Spring
Nutritional value of foods. Planning and evaluation of diets. Practical application to daily living.		

H.E. 305 Child Development	5 Credits	Fall & Spring
Theory and laboratory of human mental, emotional, social, and physical development. Not open to students having credit in human development, child psychology or development, or adolescent psychology or development. Prerequisite: Psy. 101, 45 collegiate credits, and permission of instructor.		

H.E. 311 Costume Study: History and Design (2+3)	3 Credits	Spring
Historic costume; suitability of color, fabric and design; creative problems in costume design. Prerequisite: H.E. 122 or by arrangement. Offered as demand warrants.		

H.E. 312 Advanced Clothing (1+6)	3 Credits	Spring
Advanced clothing problems in selection, fitting, construction, fabrics, and design; modern construction techniques. Prerequisite: H.E. 113 or by arrangement.		

- H.E. 401 Consumer Buying (3+0)** 3 Credits Fall or Spring
Problems of consumers in buying goods and services to satisfy wants and needs. *Offered as demand warrants.*
- H.E. 402 Nursery School Laboratory (0+9)** 3 Credits Fall or Spring
Observation, experience, participation in the guidance of young children. *Prerequisite: H.E. or Psy. 251 and permission of instructor.*
- H.E. 404 Quantity Cookery (1+6)** 3 Credits Fall or Spring
Cooking for large groups; institutional management. *Prerequisite: H.E. 302. Offered as demand warrants.*
- H.E. 405 Camp Cookery (0+3)** 1 Credit Fall or Spring
For men only. Preparation of nutritious meals from foods available in camps. *Offered as demand warrants.*
- H.E. 406 Cafeteria Management (1+6)** 3 Credits Fall or Spring
Buying and management for institutional feeding. *Prerequisite: H.E. 404. Offered as demand warrants.*
- *H.E. 412 Clothing Problems (0+6)** 2 Credits Fall or Spring
Advanced work in clothing selection and construction. 1 Freedom in the selection and execution of problems. *Prerequisite: H.E. 312. Offered as demand warrants.*
- *H.E. 413 Pattern Drafting and Draping (1+6)** 3 Credits Fall or Spring
Drafting of flat patterns; draping of fabrics for construction of student-designed garments. *Prerequisite: H.E. 312. Offered as demand warrants.*
- H.E. 422 Weaving (0+3)** 1 Credit Fall
424 1 Credit Spring
Hand weaving of textiles, including rugs. Several looms used. Laboratory time averages three hours per week. *Offered as demand warrants.*
- H.E. 441 Family Health (1+3)** 2 Credits Fall
Family and community health; home nursing, first aid. *Offered in alternate years; next offered 1965-66.*
- *H.E. 445 Home Management (3+0)** 3 Credits Fall or Spring
Time, energy, finance, housing, and other management problems in relation to family living. *Prerequisite: H.E. 241 and Junior standing. Offered in alternate years.*
- *H.E. 446 House Planning and Furnishing (1+6)** 3 Credits Spring
Planning, building, furnishing, decorating a home. Field trips to homes. *Offered as demand warrants.*
- *H.E. 491 Seminar (1+0)** Credits Arr. Fall
492 Credits Arr. Spring
Selected topics in Home Economics.
- *H.E. 493 Special Topics (1+0)** Credits Arr. Fall
494 Credits Arr. Spring
Various subjects studied, principally through directed reading and discussions. *Admission by arrangement.*

HUMANITIES

- Humanities 211 Humanities (4+0)** 3 Credits Fall
212 3 Credits Spring
Integrated introduction to the fundamental principles of literature, music, arts, and philosophy. *Prerequisites: English 101-102, History 117-118 recommended. Sophomore standing.*

JOURNALISM

- Jour. 201 Introduction to Journalism (2+3)** 3 Credits Fall
Structure of news stories, various news leads and feature stories; gathering and evaluating information for simple news stories; writing stories. *Prerequisite: Engl. 102 or by arrangement.*

- Jour. 202 Advanced News Writing (2+3)** 3 Credits Spring
Study and writing of involved news stories; emphasis on the feature. *Prerequisite: Jour. 201.*
- Jour. 203 Photography (1+3)** 2 Credits Fall or Spring
Picture-taking techniques and darkroom procedures; emphasis on the camera in the modern press. *Admission by arrangement.*
- Jour. 204 Journalism Laboratory (0+3, 6 or 9)** 1, 2, or 3 Credits Fall or Spring
Credits arranged for students holding editorial or other positions on university publications or obtaining other similarly supervised experience in journalism practices. *Prerequisite: Engl. 102 or permission. By arrangement.*
- *Jour. 311 Magazine Article Writing (3+0)** 3 Credits Fall or Spring
Study and practice in writing articles for publication in national media. Students repeating the course limited to a total of six credits. *Admission by arrangement.*
- Jour. 312 Editing (3+0)** 3 Credits Spring
Editorial writing, editing copy, writing headlines; newspaper layout; general study of mechanical, circulation, editorial, and advertising departments. *Prerequisite: Jour. 202.*
- Jour. 493 Special Topics** Credits Arr. Fall
494 Credits Arr. Spring
Various subjects in journalism. *Offered as demand warrants. Admission by arrangement.*

LAND RESOURCES

- Land Res. 101 Conservation of Natural Resources (2+0)** 2 Credits Fall
Conservation of renewable and non-renewable natural resources, emphasizing the United States situation.
- Land Res. 311 Soils (2+3)** 3 Credits Spring
Origin and development, weathering, classification, terminology; physical and chemical properties, biology, aeration and moisture; reaction and liming; manures and fertilizers; management; problems in Alaska. *Prerequisite: Chem. 101. Offered alternate years; Next offered 1966-67.*
- Land Res. 491 Seminar** Credits Arr. Fall
492 Credits Arr. Spring
Topics in land resources. *Offered as demand warrants.*
- Land Res. 493 Special Topics** Credits Arr. Fall
494 Credits Arr. Spring
- Land Res. 691 Seminar** Credits Arr. Fall
692 Credits Arr. Spring
Topics in land resources. *Offered as demand warrants.*
- Land Res. 693 Special Topics** Credits Arr. Fall
693 Credits Arr. Spring
- Land Res. 697 Thesis** Credits Arr. Fall
698 Credits Arr. Spring
Admission by arrangement.

LINGUISTICS

- *Ling. 281, 381 Structural Linguistics and (3+0)** 3 Credits Fall
282, 382 Linguistics Analysis 3 Credits Spring
Introduction to the structure of language and practice in analysis; sound structure (phonetics and phonology); grammatical structure (morphology and syntax). Work with Alaskan Native languages. *Offered as demand warrants.*
- *Ling. 285, 385 Alaskan Eskimo (3+0)** 3 Credits Fall
286, 386 3 Credits Spring
Analysis of the living language with native speaker in the classroom. Learning to read and write the language. *Admission by arrangement. Offered as demand warrants.*
- *Ling. 388 Alaskan Athapaskan (3+0)** 3 Credits Spring
Athapaskan languages in general and Alaskan dialects in particular; dialect geography; comparative phonology; Eyak, Tlingit, Haida. *Admission by arrangement. Offered as demand warrants.*

***Ling. 485 Eskimo Workshop**
486

Credits Arr. Fall
Credits Arr. Spring

Advanced work in Eskimo, including creative writing, transcription of texts, study of comparative Eskimo dialectology; Aleut; preparation of materials for radio broadcasts and publication. *Prerequisite:* Ling. 286 or 386, or speaking knowledge of Eskimo and permission of instructor. Offered as demand warrants.

***Ling. 493 Special Topics**
494

Credits Arr. Fall
Credits Arr. Spring

Various languages and subjects in linguistics. *Admission by arrangement. Offered as demand warrants.*

MATHEMATICS

No student will be permitted to enroll in a course having prerequisites if a grade lower than C is received in the prerequisite course.

Math. A Review of Algebra (5+0)

0 Credits Fall or Summer

Required of those insufficiently prepared to take Math. 122 or 106. May be used to remove high school deficiency. Five classes 1 hr.

Math. 106 College Algebra and Trigonometry (5+0)

5 Credits Fall or Spring

Review of high school algebra, determinants, matrices, topics in the theory of equations, systems of equations, inequalities, curve sketching, probability, and applications; plane trigonometry with emphasis on the analytical and periodic properties of trigonometric functions.

†Math. 107 College Algebra (3+0)

3 Credits Fall or Spring

Review of high school algebra, determinants, matrices, topics in the theory of equations, systems of equations, inequalities, curve sketching, probability, and applications.

Math. 108 Trigonometry (2+0)

2 Credits Fall or Spring

Plane trigonometry with emphasis on the analytical and periodic properties of trigonometric functions. *Prerequisite:* Math. A or equivalent.

†Math. 109 Analytic Geometry (3+0)

3 Credits Fall or Spring

Rectangular co-ordinate system, the straight line, conic sections, transcendental curves, polar co-ordinates, parametric equations, and solid analytic geometry. *Prerequisite:* High School trigonometry or Math 108.

Math. 110 Mathematics of Finance (3+0)

3 Credits Spring

Simple and compound interest, discount, annuities, amortization, sinking funds, depreciation and capitalization. *Prerequisite:* Math. A or by arrangement.

†Math. 111 Beginning Calculus (3+0)

3 Credits Fall or Spring

Sequences, limits, differentiation and applications, integration and applications, differentiation of algebraic and transcendental functions. *Prerequisite:* Math 109.

Math. 121 Introduction to Modern Algebra and Analysis
122

4 Credits Fall
4 Credits Spring

First Semester: Sets, relations, functions, algebraic systems, groups, rings, fields, vectors spaces, matrices, and linear transformations.

Second Semester: Trigonometry limits, continuity, differentiation, integration, differential equations, difference equations. *This sequence is not open for credit to Math majors. The student may enroll in Math 200 upon completion of this sequence.*

Math. 200 Calculus (4+0)

201 4 Credits Fall or Spring
202 4 Credits Fall or Spring
202 4 Credits Fall or Spring

Techniques and application of differential and integral calculus, vector analysis, partial derivatives, multiple integrals and infinite series. *Prerequisite:* Math. 106 or 122. *Admission to Math. 201 is also possible on completion of Math. 111.*

- Math. 204 Elementary Probability & Statistics (3+0)** 3 Credits Spring
Descriptive statistics, frequency distributions, mean, median, mode, standard deviation; elementary probability; inferential statistics, estimation of population parameters, tests of hypothesis including non-parametric methods, correlation, linear regression, and analysis of variance. *Prerequisite: Math. 106 or Math. 121.*
- Math. 205 Mathematics for Teachers (3+0)** 3 Credits Fall
Background for better understanding and appreciation of fundamental principles, underlying mathematics taught in elementary schools. *Prerequisite: Math. 121.*
- Math. 302 Differential Equations (3+0)** 3 Credits Fall
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, applications. *Prerequisite: Math. 202.*
- Math. 303 Introduction to Modern Algebra (3+0)** 3 Credits Fall
A critical examination of the familiar real and complex number system from a postulational point of view, followed by generalizations to groups, rings, and fields.
- Math. 309 Programming of Digital Computers (3+0)** 3 Credits Fall
Organization, function, and applications of digital computers, with special reference to IBM 1620. Programming languages, including machine language, SPS, FORTRAN, and Algol. Directed primarily to needs of scientific and statistical calculation. Emphasis on individual use of the IBM 1620. *Prerequisite: Math. 202 or Math. 204 or permission of instructor.*
- Math. 310 Numerical Analysis (3+0)** 3 Credits Spring
Finite differences, numerical solutions of differential equations, relaxation methods, interpolation, equations and matrices. *Prerequisite: Math. 202 and Math. 302 recommended.*
- Math. 312 Numerical Methods for Engineers (3+0)** 3 Credits Spring
Numerical analysis and computer programming designed for engineering students. FORTRAN language for IBM 1620; numerical approximations, solution of differential equations, non-linear equations, iterative and direct methods for simultaneous linear equations. Individual use of computer parallels lecture topics. *Prerequisite: Math. 302.*
- Math. 314 Linear Algebra (3+0)** 3 Credits Spring
Linear equations, vector spaces, matrices, determinants, linear transformations, characteristic values. Inner product spaces.
- Math. 371 Probability (3+0)** 3 Credits Fall
372 3 Credits Spring
Definitions, sample spaces combinatorial analysis, occupancy and ordering problems, conditional probability. Poisson, binomial, and normal distributions, random variables, expectation, law of large numbers, characteristic functions. *Prerequisite: Math. 202.*
- Math. 401 Advanced Calculus (3+0)** 3 Credits Fall
402 3 Credits Spring
Partial differentiation, vectors, Stieltjes integral, multiple integrals, line and surface integrals, series, convergence of improper integrals, Fourier series. *Prerequisite: Math. 202 and consent of instructor.*
- Math. 407 Mathematical Statistics (3+0)** 3 Credits Fall
408 3 Credits Spring
Distributions of random variables and functions of random variables, interval estimation, point estimation, sufficient statistics, order statistics, tests of hypotheses including criteria for goodness of test. *Prerequisite: Math. 372. Offered as demand warrants.*
- Math. 409 Experimental Design (3+0)** 3 Credits
Methods of analyzing data; constructing and analyzing designs for experimental investigations; completely randomized, randomized block, and Latin-square designs, split-plot design, incomplete block design, simple and partially confounded factorial designs, lattice and cubic lattice designs, treatment of missing data, comparison of designs. *Prerequisite: Math. 202. Offered as demand warrants.*
- Math. 415 Game Theory & Linear Programming (3+0)** 3 Credits Fall
Mathematical approach to Game Theory and Linear Programming with application to economics and operations research. *Prerequisite: Math. 314.*
- Math. 417 Differential Geometry (3+0)** 3 Credits Fall
418 3 Credits Spring
Differential geometry of curves and spaces in Euclidean three-space and extensions to Riemannian n-space.

- *Math. 421 Vector and Tensor Analysis (3+0)** 3 Credits
Fundamental operations on vectors and tensors, consideration of gradient, divergence, and curl; applications in physics and mechanics. *Offered as demand warrants.*
- Math. 471 Stochastic Processes (3+0)** 3 Credits Fall
Elements of stochastic processes and their applications, the Wiener process and the Poisson process, stationary and evolutionary processes, harmonic analysis, random walks, Markov Chains, and elementary queueing theory. *Prerequisite: Math. 372. Offered as demand warrants.*
- *Math. 491 Seminar** Credits Arr. Fall
492 Credits Arr. Spring
Topics are selected according to needs and interests of the students to introduce them to independent study and research.
- Math. 493 Special Topics (2+0)** Credits Arranged Fall
494 Credits Arr. Spring
Primarily for mathematics majors. Various topics studied.
- Math. 601 Complex Function Theory (3+0)** 3 Credits Fall
602 3 Credits Spring
Analytic functions, singularities, analytic continuation, integration, Riemann surfaces, the logarithmic function, conformal representation. *Prerequisite: Math. 402 or by arrangement. Offered as demand warrants.*
- Math. 605 Real Function Theory (3+0)** 3 Credits Fall
606 3 Credits Spring
Real number system, sequences, topological spaces, measure theory. Lebesgue integral. *Prerequisite: Math. 402, or by arrangement. Offered as demand warrants.*
- Math. 608 Partial Differential Equations (3+0)** 3 Credits Spring
First and second order differential equations, boundary value problems, existence and uniqueness theorems, Green's functions, principal equations of mathematical physics. *Prerequisite: Math. 402, or by arrangement. Offered as demand warrants.*
- Math. 609 Modern Algebra (3+0)** 3 Credits Fall
610 3 Credits Spring
Groups, rings, fields, matrices, lattices, vector spaces, representation. *Prerequisite: Math. 303. Offered as demand warrants.*
- Math. 611 Mathematics of Physics & Engineering (3+0)** 3 Credits Fall
612 3 Credits Spring
Infinite series, functions of several variables, algebra and geometry of vectors, matrices, vector field theory, partial differential equations, complex variables. *Prerequisite: Math. 302. Offered as demand warrants.*
- Math. 693 Special Topics** Credits Arr. Fall
694 Credits Arr. Spring
Various subjects studied.
- Math. 697 Thesis** Credits Arr. Fall
698 Credits Arr. Spring
- †Not offered on College campus.

MECHANICAL ENGINEERING

- M.E. 302 Kinematics of Machines (2+3)** 3 Credits Spring
Velocity and acceleration analyses of mechanisms and machines; principles of transforming and transmitting motion, including linkages, cams, gears, belts, chains, and trains of mechanism; dimensional synthesis. *Prerequisite: Math. 202, E.S. 208.*
- M.E. 321 Industrial Processes (3+0)** 3 Credits Fall
Methods and equipment used in working, welding, casting, cutting, machining and fabrication of materials.
- M.E. 401 Machine Design (2+6)** 3 Credits Fall
Design of machine elements, including allowances, tolerances, keys, shafts, couplings, springs, clutches, belts, brakes, flywheels, power screws, gears, bearings, lubrication and stress analysis of components. *Prerequisite: E.S. 331, M.E. 302.*

M.E. 412 Space Conditioning (2+3) 3 Credits Spring
Principles of heating, ventilating, air conditioning and refrigeration with practical applications.
Prerequisite: E.S. 341, E.S. 346, M.E. 441.

M.E. 413 Mechanical Engineering Thermodynamics (3+0) 3 Credits Fall
Continuation of E.S. 346, including vapor power cycles (rankine, reheat, binary and regenerative cycles); flow through nozzles and diffusers; gas power cycles; gas mixtures and psychrometrics; vapor compression refrigeration cycles. *Prerequisite: E.S. 346, E.S. 341.*

M.E. 418 Power Analysis (3+3) 4 Credits Spring
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. *Prerequisite: M.E. 413.*

M.E. 430 Instruments and Controls (2+3) 3 Credits Fall or Spring
Automatic control and instrumentation of equipment including mechanical, hydraulic, pneumatic, electric and electronic systems. *As demand warrants. Prerequisite: Senior standing.*

M.E. 441 Introductory Heat Transfer (3+0) 3 Credits Fall
Theory of heat and mass transfer, including transient, two dimensional heat flow and changes of state. *Prerequisite: E.S. 346.*

METALLURGY

Met. 304 Introduction to Metallurgy (3+0) 3 Credits Spring
Definitions and principles of basic science and engineering principles as applied to process and adaptive metallurgy. *Prerequisites: Math. 102, Chem. 202 or 211, Phys. 212.*

Met. 312 Fire Assaying (0+6) 2 Credits Spring
Sampling and preparation of ores, mill products, and smelter products for assay. Assaying gold; silver, and lead. *Prerequisite: Met. 301, concurrent Chem. 212. Offered as demand warrants.*

Met. 332 Physical Metallurgy and Metallography (3+3) 4 Credits Spring
Properties of metals and alloys, metal crystals, chemical and metallic bonds, equilibrium diagrams, defect in metals, heat treatment, pyrometry, foundry, forging welding, principles and application of electron microscope, x-ray. Electron and x-ray diffraction. Equipment used in metallurgy. *Prerequisite: Met. 304. Offered as demand warrants.*

Met. 493 Special Topics Credits Arr. Fall
494 Special Topics Credits Arr. Spring

Various subjects studied, principally through directed reading and discussions. *Admission by arrangement.*

Met. 693 Special Topics Credits Arr. Fall
694 Credits Arr. Spring

Various subjects studied. *Admission by arrangement.*

MILITARY SCIENCE

Mil. 101 First-Year Military Science (2+1) 1½ Credits Fall
102 1½ Credits Spring

First-year basic: Organization of the Army; individual weapons and marksmanship; U.S. Army and National Security; school of the soldier and exercise of command.

Mil. 201 Second-Year Military Science (2+1) 1½ Credits Fall
202 1½ Credits Spring

Second-year basic: American military history; map and aerial photography reading; introduction to operations and basic tactics; school of the soldier and exercise of command.

Mil. 301 Third-Year Military Science (3+1) 3 Credits Fall
302 3 Credits Spring

First-year advanced: Leadership; military teaching; branches of the Army; small unit tactics; communications; school of the soldier and exercise of command.

Mil. 401 Fourth-Year Military Science (3+1) 3 Credits Fall
402 3 Credits Spring

Second-year advanced: Operations; logistics; Army administration; military law; the role of the U.S. in world affairs; service orientation; school of the soldier and exercise of command.

- Mil. 403 ROTC Flight Training** 2 Credits Fall
Thirty-five hours of ground school and thirty-six and one-half hours of flight; includes FAA flight check.

MINERAL PREPARATION ENGINEERING

- M.Pr. 313 Introduction to Mineral Preparation (2+3)** 3 Credits Fall
Elementary theory and principles of unit processes of liberation, concentration and solid-fluid separation as applied to mineral beneficiation. *Prerequisites: Junior standing or by permission.*
- M.Pr. 314 Unit Preparation Processes (1+6)** 3 Credits Spring
Principles and practices involved in liberation and concentration by gravity, electromagnetic and electrostatic methods. Analysis of costs and economics of mill operation. Flowsheets for different ores developed in the laboratory on a pilot plant scale. *Prerequisite: Min. Pr. 313.*
- M.Pr. 418 Emission and X-ray Spectroscopy (2+3)** 3 Credits Spring
Theory and application of the emission spectrograph and the X-ray spectrometer as analytical tools in the fields of science and engineering. *Prerequisite: Permission of instructor.*
- M.Pr. 433 Coal Preparation (2+3)** 3 Credits Fall
Unit operations, flowsheets, washability characteristics and control by sink-float methods for coal preparation plants. Market requirements and economics of preparation. *Prerequisites: Min. Pr. 313.*
- *M.Pr. 493 Special Topics** Credits Arr. Fall
494 Special Topics Credits Arr. Spring
Various subjects studied through directed reading, discussions and laboratory work. *Admission by arrangement.*
- M.Pr. 601 Froth Flotation (2+3)** 3 Credits Fall
Theory and application of bulk and differential froth flotation to metallic minerals, non-metallic minerals and coal. *Admission by arrangement.*
- M.Pr. 606 Plant Design (1+6)** 3 Credits Spring
Selection, design and layout of equipment for erection and operation of mineral and coal beneficiation plants for specific custom and milling problems. *Admission by arrangement.*
- M.Pr. 693 Special Topics** Credits Arr. Fall
694 Credits Arr. Spring
Various subjects studied. *Admission by arrangement.*
- M.Pr. 695 Mineral Preparation Research (1+6)** 3 Credits Fall
696 3 Credits Spring
Familiarizes students with the concept of basic research and its needs in the field of mineral beneficiation, including such research subjects as magnetic susceptibility, dielectric constants and electrical conductivity of minerals; chemical theory and mechanism of bubble contact in flotation; the effect of ultrasonic vibration in unit processes. *Admission by arrangement.*
- M.Pr. 697 Thesis** 3 Credits Fall
698 3 Credits Spring
Application of fundamentals to the actual beneficiation problems of Alaskan ores; to produce increased effectiveness in ability to organize, interpret, and present the results of research clearly, precisely and with meaning in acceptable thesis form.

MINING ENGINEERING

- Min. 102 Mining Engineering Systems A, B, C (4+0)** 4 Credits Spring
Can be taken for any combination of parts A, B, C.
Min. 102A—Introduction to mineral industries and elementary principles of exploration. Four, one hour classes per week for 4 weeks. 1 Credit.
Min. 102B—Utilization and application of mining explosives. Four, one hour classes for 4 weeks. 1 Credit.
Min. 102C—Fundamentals of Mining systems for bedded, massive, vein and surface deposits. Four, one hour classes per week for 8 weeks. 2 Credits.
- Min. 302 Mine Surveying (2+3)** 3 Credits Spring
Surveying principles for surface and underground control of mining properties. Field and office procedures for preparation of maps and engineering data. *Prerequisite: E.S. 112.*

Min. 303 Mining Plant Engineering (3+3)	4 Credits	Fall
Principles of mine ventilation, haulage, pumping and energy transmission systems. <i>Prerequisites:</i> Min. 102, Phys. 212 and E.S. 341 (concurrent).		
Min. 306 Rock Mechanics (2+3)	3 Credits	Spring
Analysis of stress and strain. Physical properties of rock and fundamentals of rock behavior. Rock stresses in mining with design and layout of underground workings. <i>Prerequisite:</i> E.S. 331.		
Min. 331 Mining Law (2+0)	2 Credits	Fall
History of the development of mining law; the essentials of mining laws of the United States and Alaska. Discussions and interpretation of important court decisions in mining litigation. <i>Offered as demand warrants.</i>		
Min. 400 Practical Engineering Report	1 Credit	Spring
Twelve weeks practical work in some industry or project related to the students option, or equivalent. Performed during one or more of the summer vacations prior to the fourth year. <i>Offered as demand warrants.</i>		
Min. 405 Geophysical and Geochemical Exploration (2+3)	3 Credits	Spring
Theory and techniques of geophysical and geochemical exploration. Chemical, gravimetric, seismic, electrical, magnetic and radioactive measurements. <i>Prerequisites:</i> Chem. 202, Phys. 212.		
Min. 408 Mineral Valuation and Economics (3+3)	4 Credits	Spring
Theory of sampling techniques, deposit and reserve calculations, and analysis of mineral economic problems. <i>Prerequisite:</i> Min. 102 or permission.		
Min. 430 Seminar and Senior Field Trip	1 Credit	Fall or Spring
Mining field trip. Mines and districts, selected for exemplifying and providing instruction in geological principles, mining methods, metallurgical practices, and industrial economics. Seminar discussions cover operations and industries visited and current mineral industry problems. <i>Prerequisite:</i> Senior standing and by permission. <i>Fee:</i> Field trip expenses to be paid by student. <i>Offered as demand warrants.</i>		
Min. 493 Special Topics	Credits Arr.	Fall
494 Special Topics	Credits Arr.	Spring
Various subjects studied, principally through directed reading and discussions. <i>Admission by arrangement.</i>		
Min. 496 Mining or Mineral Research (1+6)	3 Credits	Spring
Selected mining, mineral preparation or mineral economic research problems. <i>Prerequisite:</i> Senior standing or permission.		
Min. 621 Advanced Mineral Economics (3+0)	3 Credits	Fall
Economics of mineral exploitation and utilization. International trade, state and federal policies, financial control and research methods. <i>Admission by arrangement.</i>		
Min. 691 Seminar	Credits Arr.	Fall
692	Credits Arr.	Spring
Reading and report required. <i>Admission by arrangement.</i>		
Min. 693 Special Topics	Credits Arr.	Fall
694	Credits Arr.	Spring
Various subjects studied. <i>Admission by arrangement.</i>		
Min. 697 Thesis	Credits Arr.	Fall
698	Credits Arr.	Spring

MUSIC

Music 101 Chorus (0+3)	1 Credit	Fall
	1 Credit	Spring
Music 109 R.O.T.C. Band (0+3)	1 Credit	Fall
	1 Credit	Spring
Music 203 Orchestra (0+3)	1 Credit	Fall
	1 Credit	Spring

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Music 205 Concert Band (0+3)	1 Credit	Fall
	1 Credit	Spring
Music 211 "Choir of the North" (0+3)	1 Credit	Fall
	1 Credit	Spring
Music 307 Chamber Music (0+3)	1 Credit	Fall
	1 Credit	Spring
Music 313 Opera Workshop (0+3, 6, or 9)	1,2,3 Credits	Fall
	1,2,3 Credits	Spring
Music 317 Collegium Musicum (0+3)	1 Credit	Fall
	1 Credit	Spring
Music 319 Madrigal Singers (0+3)	1 Credit	Fall
	1 Credit	Spring

Note: Admission to ensemble courses above the 100 level is by permission of the instructor. Ensemble courses may be repeated for credit; a maximum of 12 such credits may be counted towards graduation.

Music 151, 251 Class Lessons (0+3)	1 Credit	Spring
152, 252	1 Credit	Fall

Class instruction in piano, voice, or orchestral instrument.

Fees for Class Lessons:

Lesson Fee	\$15.00
Practice Room Rental Fee	7.50

Above fees waived for students enrolled in 7 or more credit hours and majoring or minoring in Music or Music Education.

Music 161, 261, 361, 461 Private Lessons (1+0)	1 Credit	Fall
162, 262, 362, 462	1 Credit	Spring

Private instruction in piano, voice, or orchestral instrument. *Prerequisite: Admission by examination.*

Fees for Private Lessons:

Lesson Fee	\$45.00
Practice Room Rental Fee	7.50

Above fees waived for students enrolled in 7 or more credit hours and majoring or minoring in Music or Music Education.

Music 123 Introduction to Music (2+3)	3 Credits	Fall
	3 Credits	Spring

Cultivation of the understanding and intelligent enjoyment of music through a study of its elements, forms, and historical styles. Open to all students, including music majors, but not a part of the music major curriculum. May be repeated for maximum of 6 hours credit.

Music 131 Basic Theory (2+3)	3 Credits	Fall
	3 Credits	Spring

Rhythmic, melodic, and harmonic dictation; keyboard harmony, including resolution of figured bass; sight-singing and ear training; stylistic analysis of works of eighteenth and nineteenth century composers. Semesters must be taken in sequence.

Music 231 Advanced Theory (2+3)	3 Credits	Fall
	3 Credits	Spring

Continuation of Music 131-2, which is prerequisite. Development of greater keyboard facility and more advanced harmonic vocabulary; analysis of works by some twentieth century composers. Semesters must be taken in sequence.

Music 321 History of Music (3+0)	3 Credits	Fall
	3 Credits	Spring

Fall Semester: Music before 1750. *Spring Semester:* Music since 1750. *Prerequisite:* Music 232 or permission of instructor.

Music 331 Form and Analysis (1+3)	2 Credits	Fall
	2 Credits	Spring

Fall Semester: Dance forms of the seventeenth and eighteenth centuries. Development of the various sonata forms. *Spring Semester:* Detailed analysis of sonatas by Haydn, Mozart, and Beethoven. *Prerequisite:* Music 232 or consent of the instructor. Semesters must be taken in sequence.

Music 491 Senior Seminar (2+0)	2 Credits	Fall
492	2 Credits	Spring
Variety of subject matter depending on the interests and needs of students.		
Music 493 Special Topics	Credits Arr.	Fall
494	Credits Arr.	Spring
Various subjects. <i>Admission by arrangement.</i>		
Music 243 Education, Music for the Classroom Teacher (2+3)	3 Credits	Fall
	3 Credits	Spring
Introduction to music through experiences related to the teaching of music in the elementary school classroom.		
Music 315 Instrumental Methods and Techniques (1+3)	2 Credits	Fall
316	2 Credits	Spring
Playing and teaching of band instruments. <i>Fall Semester:</i> Brass instruments. <i>Spring Semester:</i> Woodwinds. <i>Prerequisite:</i> Music 232 or permission of instructor.		
Music 343 Education, Music in the Elementary School (3+0)	3 Credits	Fall
Principles, procedures, and materials for teaching music to children at the elementary level. <i>Prerequisite:</i> Music 232, 243, or permission of instructor.		
Music 344 Education, Music in the Secondary School (3+0)	3 Credits	Spring
Methods and problems of teaching music in junior and senior high schools with emphasis on the general music program. <i>Prerequisite:</i> Music 232 or consent of the instructor.		
Music 415 Instrumental Methods and Techniques (1+3)	2 Credits	Fall
416	2 Credits	Spring
Playing and teaching of string instruments. <i>Fall Semester:</i> Violin and Viola. <i>Spring Semester:</i> Cello and Bass. <i>Prerequisite:</i> Music 232 or permission of instructor.		

OFFICE ADMINISTRATION

O.A. 101 Shorthand (2+2)	3 Credits	Fall
102	3 Credits	Spring
Beginning Gregg Shorthand for secretarial students. Theory and reading practice first semester; dictation and transcription practice second semester.		
O.A. 103 Elementary Typewriting (2+2)	2 Credits	Fall or Spring
Basic typewriting skills, techniques of copy work and introduction to letter writing and simple tabulations. For students who have had no previous typewriting.		
O.A. 105 Intermediate Typewriting (2+2)	2 Credits	Fall or Spring
Speed development and application of typewriting skill to special letter problems, tabulations and office problems. <i>Prerequisite:</i> One year of high school typewriting or O.A. 103.		
O.A. 106 Advanced Typewriting (2+2)	2 Credits	Fall or Spring
Letter writing with special problems, reports, business forms, statistical tabulations and legal documents; emphasis is on speed and office standards. <i>Prerequisite:</i> O.A. 105 or equivalent and speed of 40 words per minute.		
O.A. 201 Intermediate Stenography (2+2)	3 Credits	Fall
202 Advanced Stenography	3 Credits	Spring
High speed shorthand dictation and transcription. <i>Prerequisite:</i> O.A. 102 and O.A. 106 or equivalent.		
O.A. 203 Office Machines (1+2)	3 Credits	Fall
Basic operation of calculating, adding, duplicating, and dictation machines. <i>Prerequisite:</i> O.A. 105 or equivalent.		
O.A. 208 Specialized Secretarial Skills (3+0)	3 Credits	Fall or Spring
Principles, practices, and rules of filing. Training and practice in the operation of transcribing machines, responsibilities and duties of the secretary; business ethics and the preparation of office manuals.		
O.A. 231 Business Correspondence (3+0)	3 Credits	Fall
Fundamentals of business writing; emphasis on clarity, accuracy, and effectiveness in the writing of business letters and reports. <i>Prerequisite:</i> Engl. 102, O.A. 105 or equivalent.		
O.A. 302 Secretarial Training (3+0)	3 Credits	Spring
Business office systems, procedures, organization; professional secretarial standards and practices; C.P.S. program and requirements.		

O.A. 351 Readings in Office Administration (1+0) 1 Credit Fall or Spring
Readings in current problems, practices, procedures, methods. Not more than 2 credits to be earned by any student.

O.A. 360 C.P.S. Coaching (3+0) 3 Credits Fall or Spring
Review of current professional literature, a study of material covered in recent C.P.S. examinations, and solving of problems under examination conditions. Guidelines of the course are the requirements for the C.P.S. examination. *Prerequisite: Senior standing or approval of instructor.*

PHILOSOPHY

Phil. 201 Introduction to Philosophy (3+0) 3 Credits Fall
Terms, concepts and problems as reflected in writings of great philosophers. *Prerequisite: Engl. 102, Sophomore standing. Three classes 1 hour.*

Phil. 204 Introduction to Logic (3+0) 3 Credits Spring
Principles of deductive and inductive logic, application of these laws in science and other fields; brief introduction to symbolic logic and its applications. *Prerequisite: Sophomore standing. Three classes, 1 hour.*

Phil. 321 Aesthetics (3+0) 3 Credits Fall
The nature of aesthetic experience in poetry, music, painting, sculpture and architecture; studies in relation to artistic production and the role of art in society. *Offered in alternate years; next offered 1967-68.*

Phil. 332 Ethics (3+0) 3 Credits Spring
Examination of ethical theories and basic issues of moral thought. *Offered in alternate years; next offered 1967-68.*

Phil. 341 Epistemology (3+0) 3 Credits Fall
The nature of knowledge, truth and certainty. *Offered in alternate years, next offered 1966-67. Prerequisite: Phil. 201.*

Phil. 342 Metaphysics (3+0) 3 Credits Spring
The nature of reality comprising both ontology and cosmology. *Offered in alternate years, next offered 1966-67. Prerequisite: Phil. 201.*

Phil. 351 History of Philosophy (3+0) 3 Credits Fall
Ancient and Medieval periods. *Prerequisite: 6 Credits in Philosophy or Social Science.*

Phil. 352 History of Philosophy (3+0) 3 Credits Spring
Renaissance, Modern, and Recent periods. *Prerequisite: 6 credits in Philosophy or Social Science.*

Phil. 471 Contemporary Philosophical Problems (3+0) 3 Credits Fall
Ideological issues facing the modern world. *Prerequisite: 9 credits in Philosophy or permission of instructor.*

Phil. 481 Philosophy of Science (3+0) 3 Credits Fall
Comparison and discussion of various contemporary methodological positions. *Prerequisite: Junior standing.*

Phil. 482 Comparative Religion (3+0) 3 Credits Spring
Seven world faiths represent answers to questions of man's duty, his destiny, and his nature. *Prerequisite: Permission of instructor.*

Phil. 484 Philosophy of History (3+0) 3 Credits Spring
Critical examination of the nature of history and historical inquiry. *Prerequisite: 9 credits in Philosophy or Social Science.*

Phil. 493 Special Topics Credits Arr. Fall
494 Credits Arr. Spring
Various subjects. *Credits arranged.*

PHYSICAL EDUCATION

P.E. 101 Freshman Physical Education (Women) (0+3) 1 Credit Fall
102 1 Credit Spring

Required for women; a variety of activities to improve the physical condition, coordination and physical skills of the individual; regulation gym suits are required.

P.E. 103 Fundamentals of Sports— (0+2) Tennis and Badminton Skills, rules, strategies, terminology of tennis and badminton.	1 Credit	Fall
P.E. 105 Freshman Physical Education (Men) (0+3) 106 Required for men, except R.O.T.C. Cadets, ex-servicemen and physical education majors; selected activities for the acquisition of physical skills, leisure-time activities and physical vigor. Regulation gym suits are required.	1 Credit 1 Credit	Fall Spring
P.E. 107 Beginning Swimming (0+3) Front and back float, front and back strokes and other basic strokes; non-swimmers only are eligible; may substitute for P.E. 201 or 202 (Women); P.E. 105 (Men); may not be taken concurrently with P.E. 101, 102, 201, 202 (Women), or P.E. 105, 106, 205, 206 (Men).	1 Credit	Fall or Spring
P.E. 108 Handball (0+3) Fundamentals, rules and strategy of handball.	1 Credit	Spring
P.E. 109 Beginning Skiing (0+3) Fundamentals of skiing on slopes.	1 Credit	Spring
P.E. 111 Principles of Physical Education (4+0) Basic principles and philosophy of physical education; its relation to general education; biological, sociological, and psychological bases.	4 Credits	Fall
P.E. 113 Ice Skating (0+3) Fundamentals and techniques. Outdoor and indoor activities conducted until ice is available.	1 Credit	Fall
P.E. 142 Personal and Community Health (3+0) Development of positive health attitudes; principles and practices of personal and community health.	3 Credits	Spring
P.E. 146 First Aid (2+0) Knowledge and skills necessary to provide efficient aid and treatment in emergencies.	2 Credits	Fall or Spring
P.E. 201 Sophomore Physical Education (Women) (0+3) 202 Continuation of P.E. 101-102.	1 Credit 1 Credit	Fall Spring
P.E. 205 Sophomore Physical Education (Men) (0+3) 206 Continuation of P.E. 105-106.	1 Credit 1 Credit	Fall Spring
P.E. 207 Intermediate Swimming (0+3) Advanced instruction in basic strokes, stressing skill in performance and endurance; instruction in water safety and accident prevention. <i>Prerequisite: P.E. 107 or ability to swim one hundred yards with good form.</i>	1 Credit	Fall or Spring
P.E. 209 Advanced Skiing (0+3) Learning skills of advanced slope and cross-country skiing.	1 Credit	Fall
P.E. 211 Fundamentals of Sports— (0+2) Volleyball and Soccer Skills, rules, strategies, terminology of Volleyball and Soccer.	1 Credit	Fall
P.E. 212 Fundamentals of Sports— (0+2) Recreational Activities Skills, rules, strategies, terminology of such activities as archery, bowling, table tennis and shuffleboard.	1 Credit	Spring
P.E. 213 Fundamentals of Sports—Swimming (0+2) Skills, techniques, terminology of basic strokes; instruction in water safety and accident prevention; a preparatory course for P.E. 401.	1 Credit	Fall
P.E. 214 Fundamentals of Sports—Skiing (0+2) Skills, techniques, terminology of alpine type and cross-country skiing. Methods of instruction.	1 Credit	Spring
P.E. 215 Fundamentals of Sports— (0+2) Tumbling and Gymnastics Skills, techniques, terminology of tumbling and gymnastics.	1 Credit	Fall

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- P.E. 216 Fundamentals of Sports—Rhythms (0+2)** 1 Credit Spring
Skills, terminology and basic patterns of movement.
- P.E. 220 Physical Education for the Elementary School (2+3)** 3 Credits Spring
Philosophy, source materials, games, rhythmic, group activities and program planning; participation required to gain skills and techniques of teaching activities for elementary grade children.
- P.E. 301 Techniques in Physical Education (2+1)** 2 Credits Fall
Basketball (Men)
Methods of coaching and training basketball teams; strategy, methods, and psychology of offense and defense.
- P.E. 302 Techniques in Physical Education (2+1)** 2 Credits Spring
Track and Field
Methods and strategy of coaching track and field; form, technique and training for events; organization and conduct of meets; construction, assembly and use of equipment.
- P.E. 303 Techniques in Physical Education (2+1)** 2 Credits Fall
Team Sports (Women)
Methods and practice, analysis of skills and progressions for selected team sports for women.
- P.E. 317 Senior Life Saving (0+3)** 1 Credit Fall
Instruction in basic skills and techniques of life saving; personal safety skills, non-swimming assists, swimming assists, approaches and carries, body recovery, releases, equipment rescue, lifts, carries, and let-downs, and resuscitation. *Prerequisite: P.E. 207 or demonstrated swimming skill and water agility.*
- P.E. 331 Sports Officiating (1+3)** 2 Credits Fall
Ethics of sports officiating; mastery, interpretation and application of sports rules; laboratory consists of game officiating in the intramural program.
- P.E. 358 History of Physical Education (3+0)** 3 Credits Spring
The position of physical education in successive societies since primitive man, with emphasis on its relation to general education.
- P.E. 400 Techniques in Physical Education (2+1)** 2 Credits Spring
Tumbling and Gymnastics
Methods and practice in teaching tumbling and gymnastics. *Prerequisite: P.E. 215.*
- P.E. 401 Techniques in Physical Education (2+1)** 2 Credits Fall
Aquatics and Rhythms
Methods and materials, techniques and practice in teaching aquatics and rhythms. *Prerequisite: P.E. 213 and P.E. 216.*
- P.E. 425 Organization and Administration of (3+0)** 3 Credits Fall
Physical Education
Philosophy, methodology and problems of planning, organizing and directing the total physical education program at the secondary school level.
- P.E. 440 Prevention and Care of Athletic Injuries (2+1)** 2 Credits Spring
Athletic injuries; practical and theoretical aspects of taping, bandaging and massage; physical therapeutic procedures.
- P.E. 493 Special Topics** Credits Arr. Fall
494 Credits Arr. Spring
Individual study of chosen topic in health, physical education or recreation. Approved by the department and directed by a selected staff member.

PHYSICS

- Phys. 103 College Physics (4+3)** 4 Credits Fall
104 4 Credits Spring
Unified classical and modern physics for majors in the arts, biological sciences and education. *Prerequisite: High school algebra and geometry.*

Phys. 111 General Physics (2+3)	3 Credits	Fall
112	3 Credits	Spring
Mechanics, conservation laws, statics, oscillations, gravitation, fluids, sound and heat. Identical with E.S. 111-112. <i>Prerequisite: Credit or registration in Math. 101 (Fall) and Math 102 (Spring).</i>		
Phys. 211 General Physics (3+3)	4 Credits	Fall
212	4 Credits	Spring
Thermodynamics and kinetic theory, electricity and magnetism, electromagnetic oscillations, waves and propagation, optics, quantum physics. <i>Prerequisite: Math. 102, Phys. 112 or E.S. 112, credit or registration in Math. 201 (Fall), Math 202 (Spring).</i>		
Phys. 275 Astronomy (3+0)	3 Credits	Fall
276	3 Credits	Spring
Science elective for the general student. <i>Fall:</i> Stellar astronomy. Nature of radiation, physical properties and distribution of stars, galactic structure and cosmology. <i>Spring:</i> The solar system, laws of motion, the earth, the moon, planets, comets and meteors, cosmogony. Evening demonstrations both semesters. <i>Prerequisite: Sophomore standing. Phys. 275 not required for 276.</i>		
Phys. 280 Shop Technique (0+3)	1 Credit	Fall or Spring
Elements of machine tool operation, welding, soldering, glass blowing, high vacuum technique. Rudiments of apparatus construction. Shop project. Enrollment limited. <i>Prerequisite: Permission of instructor.</i>		
Phys. 281 Astronomy Laboratory (0+3)	1 Credit	Fall
282	1 Credit	Spring
Laboratory experiments in gravitation, geometrical optics, physical optics, radiometry, photoelectricity, spectrophotometry and spectroscopy illustrating and supplementing Phys. 275-276. <i>Prerequisite: Sophomore standing, Phys. 281 not required for 282.</i>		
Phys. 301 Applied Physics (2+3)	3 Credits	Fall
302	3 Credits	Spring
Applied physics for majors in the arts, biological sciences, and education. Electronics, atomic structure and spectra, nuclear structure and reactions, radioactivity, tracer techniques, nuclear power. <i>Prerequisite: Phys. 104, Math. 102.</i>		
Phys. 311 Classical Physics (4+0)	4 Credits	Fall
312	4 Credits	Spring
Selected topics from mechanics, thermodynamics, kinetic gas theory, statistical mechanics, acoustics, geometric and physical optics. <i>Prerequisite: Phys. 212, Math. 202, or permission of instructor.</i>		
Phys. 331 Electricity and Magnetism (3+0)	3 Credits	Fall
332	3 Credits	Spring
Electrostatics, dielectrics, magnetostatics, magnetic materials, electromagnetism, Maxwell's equations, plane electromagnetic waves, radiation, selected topics from circuit theory and electronics. <i>Prerequisite: Phys. 212, Math. 202.</i>		
Phys. 361 General Geophysics (3+0)	3 Credits	Fall
362	3 Credits	Spring
Introduction to basic geophysics including terrestrial electricity and magnetism, meteorology and seismology, geodesy and volcanology, glaciology, oceanography and tectonophysics. <i>Prerequisites: Junior standing. Phys. 104 or 212, Math. 102, Chem. 102, one semester of Geology. Offered as demand warrants.</i>		
Phys. 381 Physics Laboratory	Credits Arr.	Fall
382	Credits Arr.	Spring
Laboratory experiments illustrating and supplementing Phys. 311-312, and Phys. 331-332. Enrollment limited. <i>Prerequisite: Permission of Instructor.</i>		
*Phys. 411 Modern Physics (3+0)	3-4 Credits	Fall
412	3-4 Credits	Spring
Relativity, elementary particles, atomic structure, x-rays, solid state physics, nuclear structure and reactions. Engineering majors take the 3 credit lecture course only, physics majors are required to take a supplementary 1 credit reading course. <i>Prerequisite: Physics 212, 332, Math. 302.</i>		
*Phys. 445 Solid State Physics (3+0)	3 Credits	Fall
Theory of matter in the solid state, especially semiconductors. <i>Prerequisite: Physics 212, Math. 202. Offered as demand warrants.</i>		

***Phys. 455 Atomic and Nuclear Physics (3+0)** 3 Credits Fall
Radioactivity, counters, nuclear reactions, neutron physics, nuclear fission, cosmic rays. *Prerequisite: Phys. 212, Math. 202. Offered as demand warrants.*

Phys. 460 Geophysical Prospecting (2+3) 3 Credits Fall or Spring
Basic methods in geophysical exploration and measurements, gravimetric, seismic, electrical magnetic and radioactive. *Prerequisite: Phys. 212, Geol. 101, 102, and Math. 101. Offered as demand warrants.*

***Phys. 465 Meteorology (3+0)** 3 Credits Fall or Spring
Instruments and observations. Introduction to mechanics and thermodynamics of the atmosphere. Weather analysis and forecasting. *Prerequisite: Phys. 104 or 212, Math. 102. Offered as demand warrants.*

***Phys. 470 Astronautics (3+0)** 3 Credits Fall or Spring
Principles of astronomy, foundations of mechanics, and dynamics of space flight. *Prerequisite: Phys. 212, Math. 202. Offered as demand warrants.*

***Phys. 475 Astrophysics (3+)** 3 Credits Fall or Spring
Introduction to stellar spectroscopy, atomic theory and astrophysics, stellar luminosities, luminosities, atmospheres and interior, energy production and evolution of the stars. *Admission by arrangement. Offered as demand warrants.*

***Phys. 481 Advanced Physics Laboratory** Credits Arr. Fall
482 Credits Arr. Spring
Laboratory experiments illustrating and supplementing Phys. 411, 412, 445, 455, 475. Enrollment limited. *Prerequisite: Permission of instructor.*

Phys. 485 Experimental Physics Credits Arr. Fall
486 Credits Arr. Spring
Senior projects in experimental physics. Enrollment limited. *Prerequisite: Senior standing and permission of instructor.*

***Phys. 491 Physics Seminar** Credits Arr. Fall
492 Credits Arr. Spring
Seminar courses in various topics selected according to needs and interests of students. Primarily for physics majors. *Prerequisite: Permission of instructor.*

***Phys. 493 Special Topics** Credits Arr. Fall
494 Credits Arr. Spring
Various subjects. *Admission by arrangement.*

Phys. 611 Theoretical Physics (3+0) 3 Credits Fall
612 3 Credits Spring
Fundamentals of mathematical physics with emphasis on problem solving; analytical mechanics, power series; vibrating systems; Fourier analysis; hydrodynamics, vector analysis; electromagnetism, complex analysis; wave optics, wave mechanics, matrices, perturbation theory; atomic structure, statistical physics, asymptotic expansions. *Admission by arrangement.*

Phys. 621 Classical Mechanics (3+0) 3 Credits Fall or Spring
Lagrange's equations, two-body problem, rigid body motion, special relativity, canonical equations, transformations theory and Hamilton-Jacobi method. *Admission by arrangement.*

Phys. 622 Statistical Mechanics (3+0) 3 Credits Fall
Classical and quantum statistics of independent particles, ensemble theory, applications. *Admission by arrangement.*

Phys. 625 Hydrodynamics (3+0) 3 Credits Fall or Spring
Equations of motion, irrotational motion of perfect fluid, motion of solids through fluids. Vortex motion, waves, viscosity, turbulent flow. Compressible fluids. *Admission by arrangement. Offered as demand warrants.*

Phys. 626 Magnetohydrodynamics (3+0) 3 Credits Fall or Spring
Fundamental equations of magnetohydrodynamics, magnetohydrodynamic waves. Invariants of the motion of a charged particle in a magnetic field. Dynamics of a plasma, plasma waves. *Admission by arrangement. Offered as demand warrants.*

Phys. 631 Electromagnetic Theory (3+0) 3 Credits Fall
632 3 Credits Spring
Electrostatics, magnetostatics, Maxwell's equations, potentials, Lorentz equations, field energy, gauge conditions, retarded potentials, waves, radiation, tensor formulations, non-Maxwellian electrodynamics. *Admission by arrangement.*

- Phys. 641 Radio Waves (3+0)** 3 Credits Spring
The ionosphere, Maxwell's equations and constitutive relations, propagation, magneto-ionic theory, ray theory and wave solutions. *Admission by arrangement. Offered as demand warrants.*
- Phys. 642 Radio Physics (3+0)** 3 Credits Spring
Selected topics from ionospheric absorption, diffraction and scattering of radio waves. *Admission by arrangement. Offered as demand warrants.*
- Phys. 651 Quantum Mechanics (3+0)** 3 Credits Spring
Schrodinger's equation, operator formalism, correspondence principle, central force problems, matrix representations, perturbation theory, quantum-statistical mechanics. *Admission by arrangement.*
- Phys. 652 Applied Quantum Mechanics (3+0)** 3 Credits Fall or Spring
Applications of quantum mechanics to collision problems, radiation and spectroscopy. *Prerequisite: Phys. 651 or consent of instructor. Offered as demand warrants.*
- Phys. 655 Nuclear Physics (3+0)** 3 Credits Fall or Spring
Properties of nuclei, interaction of radiation with matter, alpha emission, gamma decay, nuclear forces, mesons, neutrons, cosmic rays. *Admission by arrangement. Offered as demand warrants.*
- Phys. 660 Theoretical Geophysics (3+0)** 3 Credits Fall or Spring
Selected topics in theoretical geophysics, mainly in solid earth physics, seismology, and geomagnetism. *Admission by arrangement. Offered as demand warrants.*
- Phys. 661 Physics and Chemistry of the Upper Atmosphere (2+0)** 2 Credits Spring
Aerostatics, Composition. Kinetic theory. Properties, viscosity, thermal conductivity and diffusion. Escape. Solar radiation. Absorption. Dissociation and ionization. Positive and negative ions. Recombination, attachment and detachment. Ozone, hydroxyl, and hydrogen. The airglow. *Admission by arrangement. Offered as demand warrants.*
- Phys. 662 Ionospheric Phenomena (2+0)** 2 Credits Spring
Layer formation. Ionization by particles. Eclipse effects. Electrical conductivity. Atmospheric tides and oscillations. The geomagnetic field and its daily variations, solar and lunar. The atmosphere as a dynamo and motor. *Admissions by arrangement. Offered as demand warrants.*
- Phys. 663 The Geomagnetic Field (2+0)** 2 Credits Spring
The main field at the earth's surface. Spherical harmonic analysis; the field within the earth; the field outside the earth; the secular magnetic variation; paleomagnetism; the dynamo theory of the field and its secular variation; distortion of the outer field by electric currents associated with magnetic disturbance. *Admission by arrangement. Offered as demand warrants.*
- Phys. 664 Geomagnetic Disturbance and the Aurora (2+0)** 2 Credits Spring
The morphology, statistics, solar and ionospheric associations of magnetic disturbance; indices of disturbance; auroral phenomena; theories of magnetic disturbance and the aurora. *Admission by arrangement. Offered as demand warrants.*
- Phys. 665 Dynamic Meteorology (3+0)** 3 Credits Fall or Spring
Atmospheric statics, thermodynamics, radiation and dynamics; atmospheric turbulence; general circulation; perturbation theory. *Admission by arrangement. Offered as demand warrants.*
- Phys. 670 Solar Physics (3+0)** 3 Credits Fall or Spring
Structure of the solar interior and atmosphere theory of radiation, radio emission, solar-terrestrial relations. *Admission by arrangement. Offered as demand warrants.*
- Phys. 671 Space Physics (2+0)** 2 Credits Fall or Spring
Radiation belts, motions and magnetic fields of trapped particles, geomagnetic storm effects and primary auroral particles. *Admission by arrangement. Offered as demand warrants.*
- Phys. 675 Radio Astronomy (3+0)** 3 Credits Fall or Spring
Survey of instruments and techniques, radio wave generation and propagation in ionized media, solar radio waves, cosmic radio waves, effects of the troposphere and ionosphere on extra-terrestrial radio waves, radar astronomy. *Admission by arrangement. Offered as demand warrants.*
- Phys. 681 General Laboratory** Credits Arr. Fall
682 Credits Arr. Spring
Basic laboratory experiments in physics for graduate students. *Admission by arrangement.*

Phys. 683 Experimental Electronics 684	Credits Arr.	Fall
Advanced work in experimental electronics, in particular low noise receivers; design, construction and stabilization of parametric and tunnel diode devices. Admission by arrangement. Offered as demand warrants.	Credits Arr.	Spring
Phys. 685 Experimental Physics 686	Credits Arr.	Fall
Advanced work in experimental physics. Admission by arrangement. Offered as demand warrants.	Credits Arr.	Spring
Phys. 690 Colloquium	0 Credit	Fall or Spring
Phys. 691 Seminar 692	Credits Arr.	Fall
Various topics. Admission by arrangement.	Credits Arr.	Spring
Phys. 693 Special Topics 694	Credits Arr.	Fall
Various subjects. Admission by arrangement.	Credits Arr.	Spring
Phys. 697 Thesis 698	Credits Arr.	Fall
	Credits Arr.	Spring
Phys. 700 Review of Physics	Credits Arr.	Fall or Spr.
A reading course in theoretical physics to review and unify from an advanced standpoint the material of the basic physics courses. Primarily for advanced students. Admission by arrangement. Offered as demand warrants.		
Phys. 710 Mathematical Physics (3+0)	3 Credits	Fall or Spring
Linear spaces, operator theory, generalized functions, variational methods in theoretical physics. Prerequisite: Math. 612 or permission of instructor. Offered as demand warrants.		
Phys. 720 Relativity (3+0)	3 Credits	Fall or Spring
Origins, special theory, mechanics and electrodynamics, tensors, gravitational field equations and their solutions; particles in general relativity, cosmology; extensions to unified field theories. Admission by arrangement. Offered as demand warrants.		
Phys. 770 Theoretical Astrophysics (3+0)	3 Credits	Fall or Spring
Radiative transfer and stellar hydrodynamics; theory of continuous and line spectrum from stellar atmospheres; solar photosphere, chromosphere and corona. Admission by arrangement. Offered as demand warrants.		
Phys. 791 Seminar 792	Credits Arr.	Fall
Various subjects. Admission by arrangement.	Credits Arr.	Spring
Phys. 797 Dissertation 798	Credits Arr.	Fall
	Credits Arr.	Spring

POLITICAL SCIENCE

P.S. 101 American Government (3+0)	3 Credits	Fall
U. S. Constitution and its philosophy; evolution of the branches of government; political process in American government; and contemporary political issues.		
P.S. 102 Introduction to Political Science (3+0)	3 Credits	Spring
The political process and its examination. Goals, methods, and levels of government.		
P.S. 201 Comparative Politics: The Political Process (3+0)	3 Credits	Fall
Different constitutional molds in which the political process operates; the effect on political processes of modern techniques; and emerging political forms.		
P.S. 202 Comparative Politics: Case Studies (3+0)	3 Credits	Spring
Case studies from selected nations grouped into four classes: Western Democracies, Russian Communism, Chinese Communism, and "emerging" nations.		
P.S. 211 State and Local Government (3+0)	3 Credits	Fall or Spring
Organization and politics of State and local government in the United States; the Alaskan Constitution; and problems of statehood in Alaska. Prerequisite: P.S. 101.		

- P.S. 301 Public Administration (3+0)** 3 Credits Fall or Spring
Techniques and problems of administering public policy. The changing role of the Executive Branch in the political process. *Prerequisite: P.S. 101.*
- P.S. 321 International Affairs (3+0)** 3 Credits Fall
Development of internationalism in relation to nationalism and imperialism; attempts at world government. The League of Nations and the United Nations. International Law.
- P.S. 322 International Law and Organization (3+0)** 3 Credits Spring
Development, structure, policies and problems of public international law and organizations. Accomplishments and limitations of universal and regional organizations and law.
- P.S. 401 Political Behavior (3+0)** 3 Credits Fall
402 3 Credits Spring
Behavior of political organizations, parties, groups, politicians and individual citizens. *Prerequisite: P.S. 101 and 102.*
- P.S. 411 Political Theory (3+0)** 3 Credits Fall
412 3 Credits Spring
Ancient, classical, medieval and modern political concepts, and their effects on political behavior.
- P.S. 415 Recent Political Thought (3+0)** 3 Credits Fall or Spring
A discussion of the contributions of modern thinkers to political theory.
- P.S. 434 American Constitution (3+0)** 3 Credits Fall or Spring
Role of the judiciary in the American political system viewed both historically and through analysis of leading cases. *Prerequisite: P.S. 101.*
- P.S. 485 Seminar in Contemporary International Relations (3+0)** 3 Credits Fall or Spring
Theory of international conflict. Prerequisites for international political cooperation. The effect on international affairs of advances in military science. *Prerequisite: P.S. 321.*
- P.S. 491 Seminar** Credits Arr. Fall
492 Credits Arr. Spring
- P.S. 493 Special Topics** Credits Arr. Fall
494 Credits Arr. Spring

PSYCHOLOGY

- Psy. 101 Introduction to Psychology (3+0)** 3 Credits Fall or Spring
Fundamentals of general psychology and human behavior.
- Psy. 102 Introduction to Psychology (3+0)** 3 Credits Spring
The principal areas of general psychology. A continuation of Psy. 101. *Prerequisite: Psy. 101.*
- Psy. 205 Statistics for Behavioral Sciences (3+0)** 3 Credits Fall or Spring
Introduction to the purposes and procedures of statistics; calculating methods for the description of groups (data reduction) and for simple inferences about groups and differences between group means. *Requires high school algebra.*
- Psy. 209 Social Psychology (3+0)** 3 Credits Fall
Social influences on human behavior. *Prerequisite: 6 hours in Psy. and/or Soc.*
- Psy. 213 Experimental Psychology (2+3)** 3 Credits Fall
Supervised experiments in sensory psychology and animal and human learning. Data collection and analysis; report writing. *Prerequisite: Psy. 101 and 102, and Psy. 205.*
- Psy. 214 Experimental Psychology (2+3)** 3 Credits Spring
Continuation of Psy. 213. Experimental design and experiments in interpersonal relations and psychodynamics. *Prerequisite: Psy. 213.*
- Psy. 252 Psychology of Adolescence (2+3)** 3 Credits Spring
Mental, emotional, social, and physical development patterns during the adolescent years. Laboratory arranged for observations of adolescents in a variety of settings including public schools. Not open to students having credit in human development or child psychology or development. *Prerequisites: Psy. 101, 45 collegiate credits, and permission of instructor.*
- Psy. 303 Industrial Psychology (3+0)** 3 Credits Fall
Job and worker analysis, selection, training, fatigue, worker adjustment, morale, labor-management relations. *Prerequisite: Psy. 101 and 102 or permission.*

- Psy. 304 Abnormal Psychology (3+0)** 3 Credits Spring
Abnormalities of human behavior. *Prerequisite: Psy. 101 and 102.*
- Psy. 305 Child Development (2+9)** 5 Credits Fall & Spring
Theory and laboratory of human mental, emotional, social, and physical development. Not open to students having credit in human development, child psychology or development, or adolescent psychology or development. *Prerequisite: Psy. 101, 45 collegiate credits, and permission of instructor.*
- *Psy. 312 Comparative and Physiological Psychology (3+0)** 3 Credits Spring
Neural and hormonal basis of behavior; evolution of sensory, motor, and cerebral systems; inter-species comparisons; current research methods in these areas. *Prerequisite: Psy. 101 and 102, and Biol. 105 and 106.*
- Psy. 321 Psychological Testing (3+0)** 3 Credits Spring
Standardized psychological tests in various applied areas—administration, scoring, and interpretation of established tests. *Prerequisite: Psy. 101 and 102.*
- Psy. 392 Perception in Human Behavior (3+0)** 3 Credits Spring
Physiological, developmental, and social effects on interpretation of sensory processes. *Prerequisite: Psy. 101 and 102.*
- Psy. 406 Theories of Personality (3+0)** 3 Credits Spring
Current psychological theories, with a critical examination of the different approaches used in theory construction. *Admission by arrangement.*
- Psy. 421 Psychology of Learning (3+0)** 3 Credits Fall
Theories of human and animal learning. *Prerequisite: Psy. 101 and 102.*
- Psy. 434 Social Science Research Methods (3+0)** 3 Credits Spring
Techniques of social research—sampling, questionnaire construction, interviewing and data analysis in surveys; field and laboratory experiments; attitude scaling. *Prerequisite: Psy. 101 and 102, or Soc. 101 and 102. (Also offered as Soc. 434.)*
- Psy. 491 Seminar in Human Behavior (2+0)** 2 Credits Fall
Integrated behavioral approach emphasizing the major sociological and psychological theories with special attention to current literature. *Prerequisite: Major in sociology or psychology, or permission of instructor. (Also offered as Soc. 491.)*
- *Psy. 493 Special Topics** Credits Arr. Fall
494 Credits Arr. Spring
Various subjects. *Admission by arrangement.*

RUSSIAN

- Russ. 101 Elementary Russian (5+0)** 5 Credits Fall
102 5 Credits Spring
Designed to teach students to hear, speak, read and write Russian. Oral practice is emphasized.
- Russ. 150 Scientific Russian (3+0)** 3 Credits Spring
Rapid acquisition of a reading knowledge of scientific Russian. *Offered as demand warrants.*
- Russ. 201 Intermediate Russian (3+0)** 3 Credits Fall
202 3 Credits Spring
A continuation of Russian 102. Increasing emphasis on reading ability and cultural material. Conducted in Russian. *Prerequisite: Russian 102 or 2 years of high school Russian.*
- Russ. 321 Studies in Russian Literature (3+0)** 3 Credits Fall
322 3 Credits Spring
Choice of authors, genres, or periods of Russian literature for intensive study. *Prerequisite: Russian 202 or equivalent. Students may repeat course for credit when topic varies.*
- Russ. 493 Special Topics** Credits Arr. Fall
494 Credits Arr. Spring
Various subjects in Russian, for advanced students. *Admission by arrangement. Offered as demand warrants.*

SOCIOLOGY

- Soc. 101 Introduction to Sociology (3+0)** 3 Credits Fall or Spring
102 3 Credits Fall or Spring
Man's relationship to the society in which he lives.
- Soc. 106 Social Welfare (3+0)** 3 Credits Spring
Functions and development of modern social welfare and the distinctive features of the profession.
- Soc. 201 Social Problems (3+0)** 3 Credits Fall
Problems of contemporary society; analysis of factors giving rise to them. *Prerequisite:* Soc. 101 and 102.
- Soc. 205 Group Processes in Modern Society (3+0)** 3 Credits Fall
Formation, structure and functioning of groups; group processes and group products; implications of various research techniques. *Prerequisites:* Soc. 101 and 102.
- Soc. 207 Population (3+0)** 3 Credits Fall
Analysis of world populations; growth and decline patterns, migratory trends and ecology; worldwide implications to current population growth; critical review of major theoretical contributions with introduction to demographic methods. *Prerequisite:* Soc. 101 and 102.
- Soc. 209 Urban Sociology (3+0)** 3 Credits Fall
Growth and development of urban communities with reference to migration patterns, differentiation of functions, ecological patterns of land use, social control in secondary group associations of metropolitan magnitude. *Prerequisite:* Soc. 101 and 102.
- Soc. 232 Family and Society (3+0)** 3 Credits Spring
The family as a social institution; its dynamics in the socialization process; social change and social values. *Prerequisite:* Soc. 101 and 102.
- *Soc. 302 Minority and Ethnic Groups (3+0)** 3 Credits Spring
Social stratification; the status of the chief minorities in the continental United States; development and effects of selective immigration, assimilationism, racism. *Prerequisite:* Soc. 101 and 102.
- Soc. 304 Culture and Personality (3+0)** 3 Credits Spring
Theories of relation of variation in personality to culture and group life in primitive and modern societies; influence of the social role on behavior. *Prerequisite:* Soc. 101 and 102.
- Soc. 306 Community and Ecology (3+0)** 3 Credits Spring
Modern, industrial, centralized society and institutional structure of community life—political, economic, religious—with reference to internal structure and external sources of control and domination. *Prerequisite:* Soc. 101 and 102.
- Soc. 308 Field Practice Community Service Laboratory** Credits Arr. Fall or Spr.
Individual programs of self-help projects dealing with community needs and resources; theoretical analysis of experienced situations; learning through laboratory method. *Prerequisite:* Soc. 101, 102, 106, 205, and by arrangement.
- Soc. 321 Introduction to Social Work (3+0)** 3 Credits Fall
Scope and methods of social work with its specialized treatment and process areas. *Prerequisite:* Soc. 101 and Psy. 101.
- Soc. 322 Introduction to Social Work (3+0)** 3 Credits Spring
Historical and philosophical development of social work as an institution and profession in the United States and abroad. *Prerequisite:* Soc. 101 and Psy. 101.
- Soc. 345 Sociology of Education (3+0)** 3 Credits Fall
See description of Ed. 345, Social Foundations of Education.
- Soc. 401 Sociology of Deviant Behavior (3+0)** 3 Credits Fall
Crime and criminality in American culture. *Prerequisite:* Soc. 101 and 102.
- *Soc. 404 Sociology of Adolescence (3+0)** 3 Credits Spring
Motivations, attitudes, beliefs, behavior of this age group, including delinquent or norm-violating behavior. *Prerequisite:* Soc. 101 and 102. Offered in alternate years.
- Soc. 405 Social Change (3+0)** 3 Credits Fall
Social change in long-time perspective, with emphasis on social movements. *Prerequisite:* Soc. 101 and 102.

- Soc. 410 Sociology Theory (3+0)** 3 Credits Spring
Major sociological theories and theorists of Western civilization; review of important contributions and approaches of various "national schools" with emphasis on current American and European trends.
- Soc. 434 Social Science Research Methods (3+0)** 3 Credits Spring
See description under Psy. 434, Social Science Research Methods.
- Soc. 491 Seminar in Human Behavior (2+0)** 2 Credits Fall
See description under Psy. 491, Seminar in Human Behavior.
- *Soc. 493 Special Topics** Credits Arr. Fall
494 Credits Arr. Spring
Various subjects. *Admission by arrangement.*

SPANISH

- Span. 101 Elementary Spanish (5+0)** 5 Credits Fall
102 5 Credits Spring
Designed to teach students to hear, speak, read and write Spanish; oral practice emphasized.
- Span. 201 Intermediate Spanish (3+0)** 3 Credits Fall
202 3 Credits Spring
Continuation of Spanish 102. Increasing emphasis on reading ability and cultural material; conducted in Spanish. *Prerequisite: Spanish 102 or 2 years of high school Spanish.*
- Span. 321 Studies in Spanish Literature (3+0)** 3 Credits Fall
322 3 Credits Spring
Choice of authors, genres, or periods of Spanish and Spanish American literature for intensive study. *Prerequisite: Spanish 202 or equivalent. Offered as demand warrants. Students may repeat course for credit when topic varies.*
- Span. 493 Special Topics** Credits Arr. Fall
494 Credits Arr. Spring
Various subjects for advanced students. *Admission by arrangement. Offered as demand warrants.*

SPEECH

- Sp. 211 Public Speaking I (1+2)** 2 Credits Fall or Spring
Basic oral composition and criticism. Theory and practice of exposition and persuasion. *Prerequisite: Engl. 101 or Phil. 201 or by arrangement.*
- Sp. 212 Public Speaking II (2+0)** 2 Credits Fall or Spring
Theory and practice of rhetoric and public address. Basic works from Plato to Quintilian. Practice in advanced forms of exposition and persuasion.
- Sp. 215 Debate Practicum (0+2)** 1 Credit Fall or Spring
Training in practical debate situations. Participation in Debating Society required. May be repeated for a maximum of six credits. Students wishing to take this course and Sp. 314, Argumentation and Debate, may enroll in the latter with the consent of the Instructor and may not receive more than 8 units of credit for any combination of the two courses.
- Sp. 221 Introduction to the Theater (3+0)** 3 Credits Fall or Spring
History of theater with emphasis on dramatic form, architecture and standards of criticism.
- Sp. 223 Acting I (1+4)** 1-3 Credits Fall or Spring
Principles of acting developed through pantomime, improvisation and sense-memory; participation as an actor or technician in one Drama Workshop production required. May be repeated for a maximum of six credits. ** Prerequisite: Sp. 221 or by arrangement.*
- Sp. 231 Introduction to Broadcasting (3+0)** 3 Credits Fall or Spring
A survey of radio and television, with emphasis on the history, financing, regulation, and operation of the broadcasting industry.

*Pending A/C Approval

- Sp. 237 Announcing (1+2)** 2 Credits Fall or Spring
Microphone techniques, role of the announcer in broadcasting. Fundamentals of announcing; their practical application. *Prerequisite: Sp. 211 or by arrangement.*
- Sp. 239 Radio Operations (0+3)** 1 Credit Fall & Spring
Training in practical radio operations. Participation on KUAC staff required. May be repeated for a maximum of four credits.
- SP. 313 Argumentation and Debate (1+2)** 2 Credits Fall
Theory of argumentation and debate applied to contemporary issues. Practice in briefing and presenting arguments, testing evidence and detecting fallacies.
- Sp. 314 Discussion (1+2)** 2 Credits Spring
Nature and operation of discussion groups; use of evidence, reasoning, reflective thinking, group psychology, participant and leader behavior.
- Sp. 315 Phonetics (2+0)** 2 Credits Fall or Spring
Use of the International Phonetic Alphabet; assimilation and dialectal problems; use in acting, teaching, speech improvement. *Prerequisite: Sp. 211 or by arrangement. Offered as demand warrants.*
- Sp. 316 Voice and Diction (1+2)** 2 Credits Fall
Development of fluency and clearness in the voice; study and practice to improve speech and eliminate faults of articulation and pronunciation; phrasing, inflection and emphasis, including individual analysis and tape recordings. *Prerequisite: Sp. 211 or by arrangement.*
- Sp. 317 Oral Interpretation (2+2)** 3 Credits Fall or Spring
Interpretative reading based on textual analysis of literary forms and careful study of principles of effective reading. *Prerequisite: Sp. 211 or by arrangement.*
- Sp. 323 Acting II (1+4)** 3 Credits Fall or Spring
Building a character; role study and performance of small scenes. Participation as an actor or technician in one Drama Workshop production required. *Prerequisite: Sp. 221, 223, or by arrangement.*
- Sp. 325 Theater Production (1+4)** 3 Credits Fall or Spring
Direction of short plays for Drama Lab. productions. Principles of makeup, lighting and production. *Prerequisite: Sp. 221, 223, or by arrangement.*
- Sp. 327 Makeup for Theater (1+2)** 2 Credits Fall or Spring
Theatrical makeup, designed for actors, teachers, directors and other theater workers; makeup materials and use; straight and character makeup; illusory and plastic relief; national types; influence of lighting. (Students will spend approximately \$20.00 for materials.) *Offered as demand warrants.*
- Sp. 333 Writing for Radio and Television (3+0)** 3 Credits Fall or Spring
Preparation of announcements, interviews, music continuity, special events programs, documentaries, commentaries, news, and other basic radio and television continuity.
- Sp. 334 Radio-Television Advertising (2+3)** 3 Credits Fall or Spring
Academic approach to economics and standards of radio and television advertising. Special emphasis on ethical considerations involved in the preparation and presentation of commercial broadcast copy. *Prerequisite: Sp. 333 or by permission.*
- SP. 335 Broadcast Production (2+3)** 3 Credits Fall or Spring
Use of studio equipment; radio-tv production techniques; radio-tv station organization; tape editing; sound effects; television directing.
- *Sp. 341 Fundamentals of Speech Correction (2+0)** 2 Credits Fall
Understanding and aiding speech development in normal and speech defective children and adults; for parents, teachers and others concerned with speech problems. *Prerequisite: Sp. 211 or by arrangement.*
- *Sp. 343 Clinical Methods in Speech Correction (2+2)** 3 Credits Spring
Administration of clinical tests of speech and application of principles of speech correction; supervised clinical practice. *Prerequisite: Sp. 211, 315, 341, or by arrangement.*
- Sp. 425 Directing (3+0)** 3 Credits Spring
Directorial analysis of a major dramatic work for public presentation. Limited to senior majors with 3.00 G.P.A. in Speech.

Sp. 433 Radio-Television News (2+4) 3 Credits Fall or Spring
Responsible news writing, editing, processing and delivery for the broadcast media. Special emphasis on ethical considerations in broadcast journalism. *Prerequisite: Sp. 333 and Jour. 201 or by permission.*

Sp. 493 Special Topics Credits Arr. Fall
494 Credits Arr. Spring
Various subjects. *Admission by arrangement. Offered as demand warrants.*

*pending Academic Council approval for graduate credit

WILDLIFE MANAGEMENT

***W.M. 304 Wildlife Management Principles (2+3)** 3 Credits Fall
Economic, social, biological and other values of wildlife; basic principles of wildlife management and its integration with other land use practices; important wildlife resources of Alaska. *Prerequisite: Land Res. 101, Biol. 303.*

***W.M. 325 Scientific Sampling (2+3)** 3 Credits Fall
Sampling methods, including simple random, stratified and systematic; estimation procedures, including ratio and regression methods; special area and point sampling procedures; optimum allocation; special features of biological sampling. *Prerequisite: Math. 122 or 201, and Math. 204 or permission.*

***W.M. 410 Wildlife Techniques (2+3)** 3 Credits Spring
Field, laboratory and office techniques of collecting, analyzing, interpreting and presenting data and specimens. *Prerequisite: W.M. 304 or permission.*

***W.M. 417 Wildlife Management—Forest and Tundra (2+0)** 2 Credits Fall or Spring
Forest and tundra wildlife, with emphasis on game and fur species; correlation of wildlife management with forest and tundra land use practices. *Admission by arrangement. Offered as demand warrants.*

***W.M. 419 Wildlife Management—Wetlands (2+0)** 2 Credits Fall or Spring
Wetland wildlife with emphasis on game and fur species of fresh-water areas; correlation of wildlife management with wetland use practices. *Admission by arrangement. Offered as demand warrants.*

***W.M. 421 Hydrobiology (2+3)** 3 Credits Fall
Survey of chemical, physical and biological aspects of fresh water and the ocean, providing a background for consideration of aquatic populations. *Admission by arrangement.*

***W.M. 424 Ecology of Fishes (2+3)** 3 Credits Spring
Ecology of fishes and current applications in sport and commercial fisheries. *Prerequisite: Biol. 326, W.M. 304, 421. Admission by arrangement.*

***W.M. 426 The Analysis of Linearized Models (2+3)** 3 Credits Spring
Analysis by methods of least squares of general linearized models, including those appropriate to various designs, including completely random, randomized complete block, incomplete block and latin square, and those for the analysis of variance and analysis of covariance. Matrix algebra appropriate to least squares. *Prerequisites: Math. 201 or 122, and 204.*

W.M. 491 Seminar (2+0) 1 Credit Spring
492 1 Credit Fall

Various topics in wildlife management. *Prerequisite: Senior standing in wildlife or by arrangement. Offered as demand warrants.*

W.M. 493 Special Topics (Arrange) Credits Arr. Fall
494 Credits Arr. Spring

Various subjects studied principally through directed reading and discussions. *Admission by arrangement.*

W.M. 611 Wildlife Field Trip Credits Arr. Fall
612 Credits Arr. Spring

Trips to wildlife areas to acquaint students with principal animals of the State and problems involved in their management. *Admission by arrangement. Offered as demand warrants.*

- W.M. 621 Vertebrate Population Analysis (1+3) 2 Credits Fall
Dynamics of vertebrate populations, with particular emphasis on the collection and interpretation of vital statistics of wild populations. *Admission by arrangement. Offered as demand warrants.*
- W.M. 622 Environmental Analysis (2+3) 3 Credits Spring
Recognition, description and evaluation of factors in terrestrial environments. *Admission by arrangement. Offered as demand warrants.*
- W.M. 624 Problems in Fisheries Management (2+0) 2 Credits Spring
Selected readings and discussions relating to major fisheries of the world, their problems, and the methods of attack on these problems. *Admission by arrangement. Offered as demand warrants.*
- W.M. 691 Seminar (2+0) 1 Credit Fall
692 1 Credit Spring
Various topics in wildlife management; required of all graduate students. (Biol. 691, 692 may be substituted by permission of the major professor.) *Offered as demand warrants.*
- W.M. 693 Special Topics Credits Arr. Fall
694 Credits Arr. Spring
Various subjects studied principally through directed reading and discussions. *Admission by arrangement.*
- W.M. 695 Research Credits Arr. Fall
696 Credits Arr. Spring
Investigative work, either field or laboratory, on a problem of lesser scope than the thesis, or supplementary to the thesis. *Admission by arrangement.*
- W.M. 697 Thesis Credits Arr. Fall
698 Credits Arr. Spring
Admission by arrangement.

Registers

THE BOARD OF REGENTS

The Regents of the University of Alaska are appointed by the Governor and are confirmed by the Legislature.

ELMER E. RASMUSON, Anchorage, *President*, 1950-1969
WILLIAM A. O'NEILL, Anchorage, *Vice President*, 1948-1973
DOROTHY A. WREDE, Fairbanks, *Secretary*, 1963-1971
JOHN J. CONWAY, Sitka, 1959-1967
RUTH S. McLEAN, Nome, 1964-1967
ROBERT E. McFARLAND, Anchorage, 1963, 1971
ARTHUR J. SCHAIBLE, Fairbanks, 1961-1969
WILLIAM M. WHITEHEAD, Juneau, 1965-1973
WILLIAM R. WOOD, *President of the University, Ex-Officio Member*
CATHERINE L. BYRNE, *Treasurer, non-member official*

ADMINISTRATIVE COUNCIL

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HOWARD A. CUTLER, Ph.D., *Academic Vice President*
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HAROLD A. BYRD, B.B.A., *Comptroller of the University*
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SYLVIA CIERNICK, Ph.D., *Director, University Relations*
BEN J. ATKINSON, B.S., *Director, Physical Plant and Campus Planning*

EMERITI AND HONORARY STAFF

ERNEST N. PATTY, *President, Emeritus*
University of Washington '19, B.S.; '25, E.M.; University of Alaska '53, D.Eng.
(1922-1935, 1953-1960)

LYDIA FOHN-HANSEN, *Associate Director of Cooperative Extension, Emeritus*
Iowa State College '19, B.S.; '22, M.S.; University of Alaska '59, D.Hum. (1925-1936, 1940-1959)

TERRIS MOORE, *Honorary Professor of the University*
Williams College '29, A.B.; Harvard '33, M.B.A.; '37, D.C.S. (1949-1953, 1953-)

WILLIAM K. KELLER, *Professor of Education, Emeritus*
State College of Washington '21, A.B. and M.A.; '41, Ed.D.; University of Alaska '61, LL.D. (1952-1961)

DOROTHY H. NOVATNEY, *Professor of English, Emeritus*
Pomona College '28, B.A.; Claremont College '30, M.A.; Teachers College '38, Ed.D. (1943-1945, 1956-1963)

LOLA CREMEANS TILLY, *Professor of Home Economics, Emeritus*
University of Illinois '20, A.B.; '21, M.S.; University of Alaska '63, D.Hum. (1929-1937, 1942-1963)

ACADEMIC FACULTY AND PROFESSIONAL STAFF 1965-1966

SYUN-ICHI AKASOFU, *Professor of Geophysics*
University of Tohoku '53, B.S.; '57, M.S.; University of Alaska '61, Ph.D.

PAUL R. ALBEE, *Assistant Design Engineer*
College of Idaho '61, B.S.; University of Alaska '64, M.S.

GEORGE ALLEN, *Instructor of English (Ketchikan)*
University of Alaska '64, B.A.; '64, M.A.

LEE D. ALLEN, *Instructor, Alaska Agricultural Experiment Station*
University of Idaho '57, B.S.

- MICHAEL ALMASI, *Associate Design Engineer, Geophysical Institute.*
University of Budapest '35, M.S. in Electrical Engineering
- DARLENE APPEL, *Instructor of Office Administration (Anchorage)*
Mankato State College '56, B.S.
- KOBAD A. ARJANI, *Assistant Professor of Accounting*
University of Bombay '51, B.Com.; University of Denver '57, M.B.A.
- SARKIS ATAMIAN, *Assistant Professor of Sociology*
University of Rhode Island '50, B.S.; Brown University '54, M.A.
- BEN J. ATKINSON, *Director, Physical Plant and Campus Planning*
University of Alaska '47, B.S. in C.E.
- JOSEPH AURBACH, *Assistant Professor of English*
Louisiana State University '59, B.A.; '59, M.A.
- ELLEN AYOTTE, *Instructor, Cooperative Extension Service, District Home Demonstration Agent, Fairbanks*
Stout State College '58, B.S.
- EUNICE BAILEY, *Instructor in Office Administration (Ketchikan)*
Oregon State College '25, B.S.
- HANS-GEORG BANDI, *Associate in Archaeology*
University of Freiburg '45, Ph.D.
- MYRTLE BANG, *District Home Demonstration Agent, Palmer, and Assistant Professor, Cooperative Extension Service*
University of Minnesota '31, B.S.; University of Wisconsin '58, M.S.
- ROBERT J. BARSDATE, *Assistant Professor of Marine Science*
Allegheny College '59, B.S.; University of Pittsburgh '63, Ph.D.
- HOWARD F. BATES, *Associate Professor of Geophysics*
Oregon State University '50, B.S.; '56, M.S.; University of Alaska '61, Ph.D.
- JIMMY BEDFORD, *Associate Professor of Journalism*
University of Missouri '50, A.B.; '51, B.J.; '52, M.A.
- CLARENCE GEORGE BEERS, *University Buyer*
- CHARLES E. BEHLKE, *Director, Institute of Water Resources Research and Professor of Engineering*
Washington State University '48, B.S.; '50, M.S.; Stanford University '57, Ph.D.
- EARL H. BEISTLINE, *Dean, College of Earth Sciences and Mineral Industry, and Professor of Mining Engineering (P.E.)*
University of Alaska '39, B.Min.Engr.; '47, E.M.
- ALBERT E. BELON, *Associate Professor of Physics*
University of Alaska '52, B.S.; U.C.L.A. '54, M.A.
- ALTER BENESCH, *Assistant Professor of History*
University of Denver '55, B.A. History and Botany; University of Montana '56, M.A. Speech; Leopold Franzeus Universitat Innsbruck '63, Ph.D. in Eastern European History
- CARL S. BENSON, *Associate Professor of Geophysics*
University of Minnesota '50, B.A.; '56, M.S.; California Institute of Technology '60, Ph.D.
- EDUARD BERG, *Associate Professor of Geophysics*
University of Sarbrücken '53, Diplom Physiker; '55 Ph.D.
- FRANK THOMAS BERKEY, *Senior Research Assistant in Geophysics*
Linfield College '62, B.A.; University of Alaska '64, M.S.
- BONNIE BETTINE, *Executive Officer, Alaska Agricultural Experiment Station*
- CHRISTIANE BILLAUD, *Distinguished Associate in Music*

- JEAN-PAUL BILLAUD, *Assistant Professor of Music*
Ecole Normale de Musique de Paris '55, Diplome Supérieur de Virtuosité; '56,
Licence de Concert
- NORMAN J. BIRKHOLZ, *Assistant Professor of Chemistry and Chemical Engineering*
Montana State College '54, B.S.; '57, M.S.; '59, Ph.D.
- J. ROGER BLAKE, *Senior Research Assistant in Geophysics*
University of Melbourne '57, B.Sc.
- MARGARET BLOM, *Assistant Professor (Research), Analytical Chemistry, Alaska Agricultural Experiment Station*
University of Western Ontario '32, B.S.
- RUTH W. C. BLUMBERG, *Instructor and Assistant Reader Services Librarian*
Belleville Township Junior College '56, A.A.; Southern Illinois University '58, B.S.;
'62, M.S.; George Peabody College for Teachers '65, M.L.S.
- CLARENCE IVAN BRANTON, *Professor (Research), Agricultural Engineering, Alaska Agricultural Experiment Station*
Oregon State College '33, B.S.
- MAX BREWER, *Director, Arctic Research Laboratory and Ice Physicist*
Washington University '50, B.S.; University of Alaska '65, D.Sc. (Hon.)
- CLAYTON E. BROCKEL, *Resident Director Kenai Community College*
Montana State University '55, B.A.; Colorado State College '60, M.A.Ed.
- JAMES A. BROCHAT, *Resident Director, Sitka Community College*
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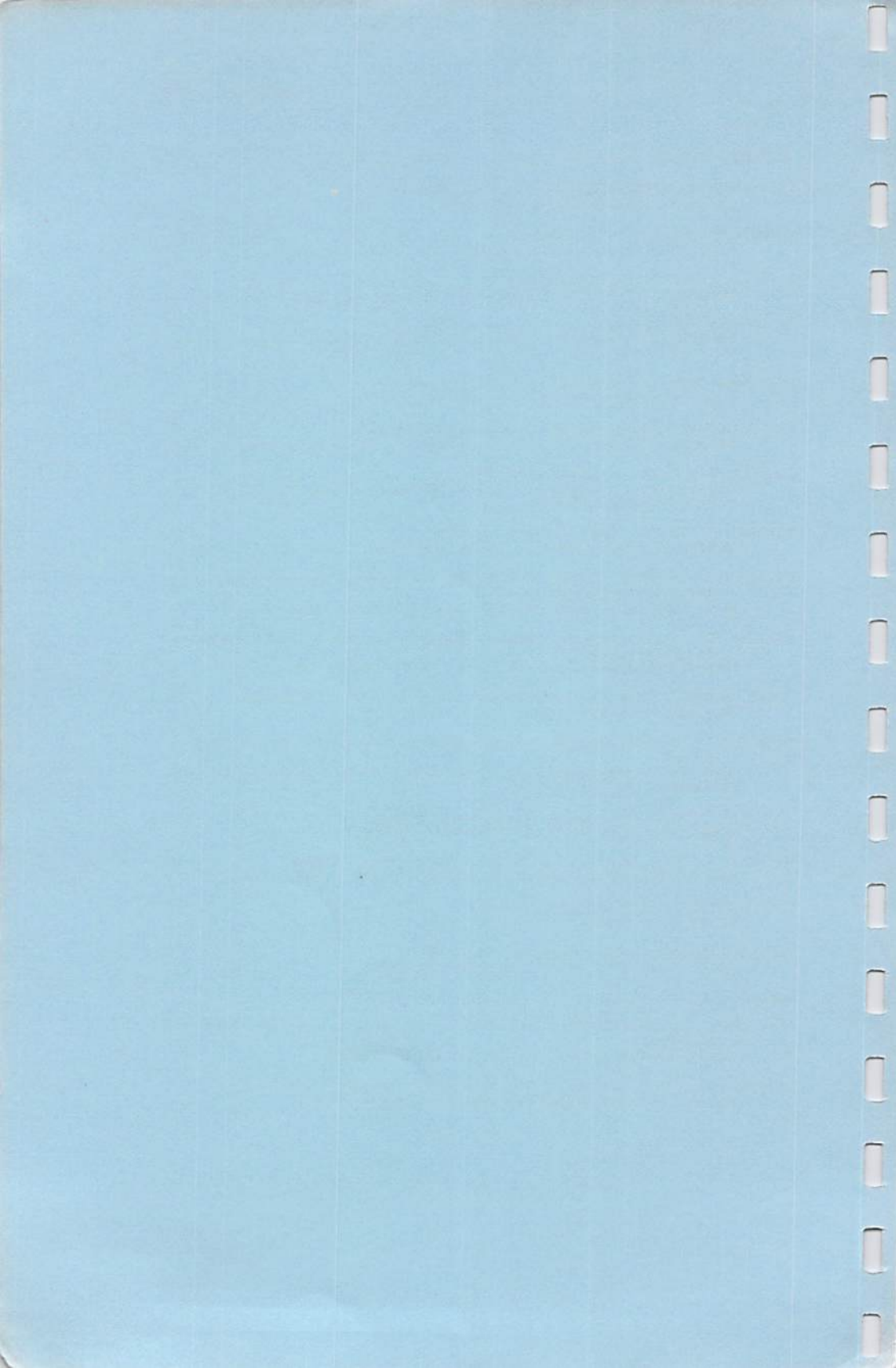
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