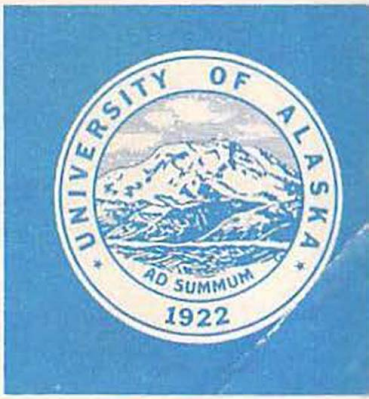

University of Alaska Catalog

1964-1965

SEPTEMBER 1964

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Catalog

University of Alaska
1964-1965

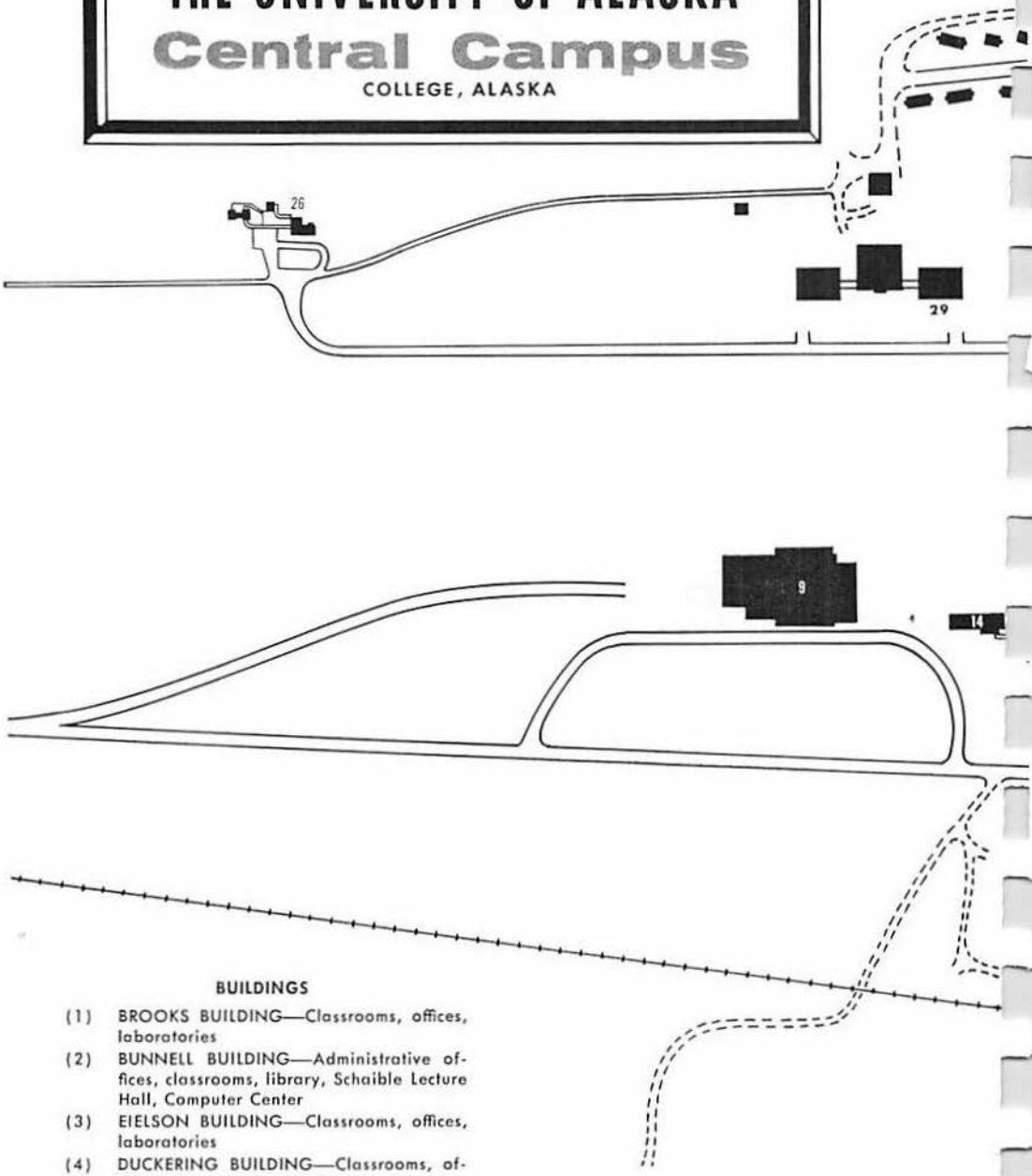
College, Alaska

Second Series, No. 30

THE UNIVERSITY OF ALASKA

Central Campus

COLLEGE, ALASKA



BUILDINGS

(1) BROOKS BUILDING—Classrooms, offices, laboratories

(2) BUNNELL BUILDING—Administrative offices, classrooms, library, Schaible Lecture Hall, Computer Center

(3) EIELSON BUILDING—Classrooms, offices, laboratories

(4) DUCKERING BUILDING—Classrooms, offices, laboratories, Institute of Marine Science, Zoophysiology Laboratory

(5) UNIVERSITY COMMONS—New facility, Fall, 1963

(6) FACULTY HOUSING

(7) FOREST RESEARCH LABORATORY

(8) GEOPHYSICAL INSTITUTE

(9) PATTY BUILDING—Gymnasium, Swimming Pool, ROTC

(10) MUSEUM—Also houses music studios

(11) HEALTH SERVICE CENTER

(12) HESS HALL—Dormitory

(13) ICE RINK

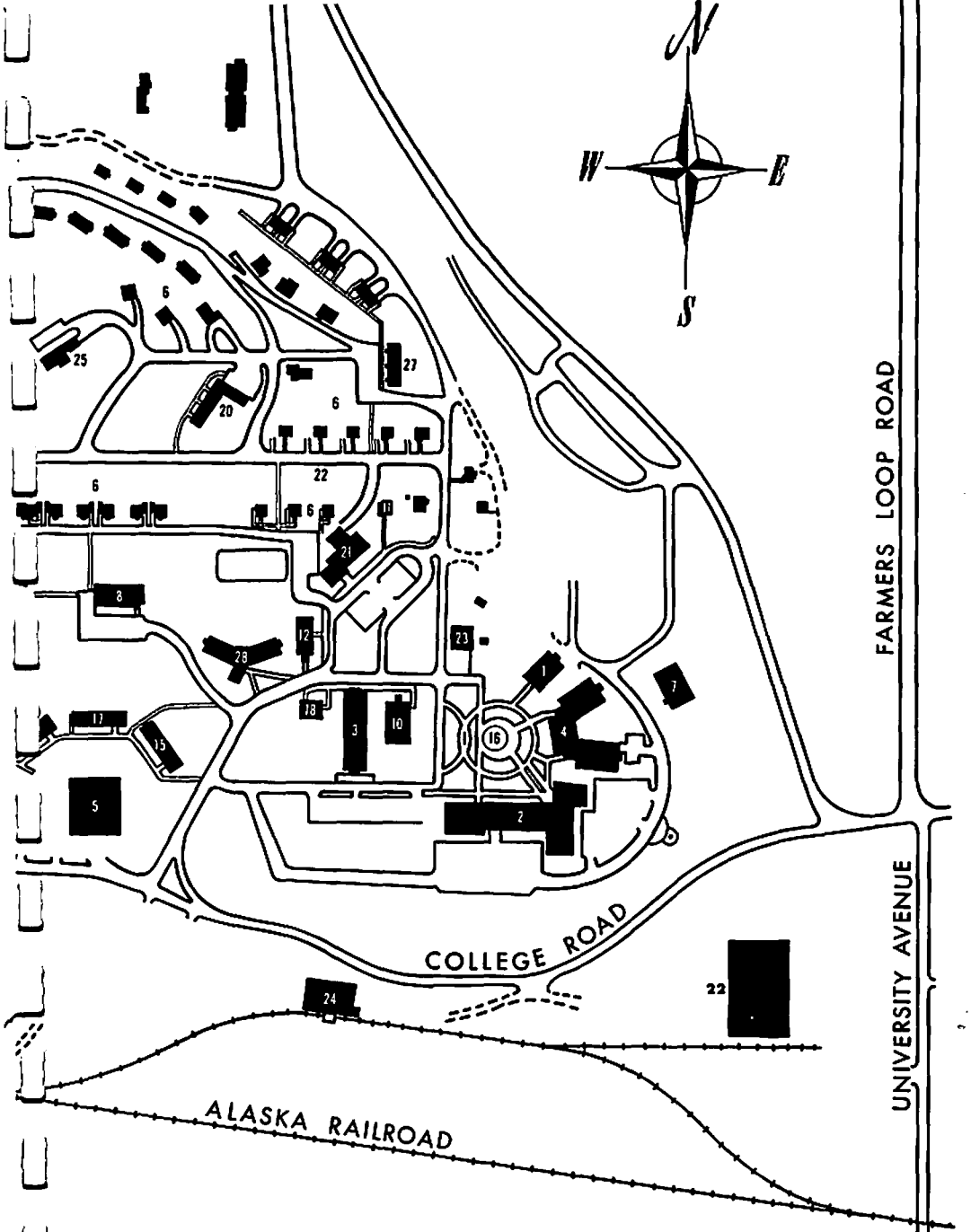
(14) LATHROP HALL—Dormitory

(15) McINTOSH HALL—Dormitory

(16) MEMORIAL PLAZA

(17) NERLAND HALL—Dormitory

(18) STATEWIDE SERVICES BUILDING—Administrative offices and Cooperative Extension Service



(19) STEVENS HALL—Dormitory
(20) STUART HALL—Faculty apartments
(21) STUDENT UNION (Constitution Hall)—Student activities offices, cafeteria, book store
(22) SERVICE BUILDING—Maintenance Shop, Buildings and Grounds
(23) POWER PLANT—Present facility
(24) POWER PLANT—New facility, Winter, 1964
(25) PRESIDENT'S RESIDENCE
(26) U. S. COAST AND GEODETIC SURVEY—Observatory houses and seismograph installation for the continuous registration of earth tremors
(27) WALSH HALL—Married students apartments
(28) WICKERSHAM HALL—Dormitory
(29) WOMEN'S DORMITORY—Under construction

Contents

University Calendar

1964 Summer Session

Short Session	June 8-June 26, 1964
Regular Session	June 29-August 7, 1964
Post Session Workshop	August 10-August 14, 1964

Proposed 1964-65 Academic Year Calendar

Labor Day	Mon., Sept. 7
Dormitory Rooms Open	Noon Sat., Sept. 5
Orientation and Guidance Testing for New Students	8:00 a.m. Tues., Sept. 8 through Sunday, Sept. 13
General Faculty Convocation	10:00 a.m. Wed., Sept. 9
Faculty Meetings (Academic Colleges)	2:30 p.m. Wed., Sept. 9
Faculty Meetings (Departmental)	9:30 a.m. Thurs., Sept. 10
Counselling of All Students by Advisers	Noon Thurs., Sept. 10 through 5:00 p.m. Fri., Sept. 11
Registration	
New Students	8:00 a.m. to 5:00 p.m. Sat., Sept. 12
Returning Students	8:00 a.m. to 5:00 p.m. Mon., Sept. 14
(Meal Tickets effective Dinner Monday, Sept. 14)	
Instruction Begins	8:00 a.m. Tues., Sept. 15
Registration Closes	5:00 p.m. Mon., Sept. 28
Last Day to Withdraw without Grade	5:00 p.m. Mon., Sept. 28
Last Day for Making Up Incompletes	5:00 p.m. Mon., Oct. 26
Six Week Grade Reports	Wed., Oct. 28
Thanksgiving Recess	Begins 5:00 p.m. Wed., Nov. 25 to 8:00 a.m. Mon., Nov. 30
Christmas Recess	Begins 5:00 p.m. Sat., Dec. 19, 1964 to 8:00 a.m. Mon., Jan. 4, 1965
Examination Study Period (No Classes)	Wed., Jan. 13
Semester Examinations	8:00 a.m. Thurs., Jan. 14 to Noon Wed., Jan. 20
Final Grades on File with Registrar	Noon Thurs., Jan. 21
End of Fall Semester	5:00 p.m. Fri., Jan. 22

1964-65 Spring Semester

Dormitory Rooms Available	Noon Wed., Jan. 20
Orientation and Guidance Testing for New Students	9:00 a.m. Thurs., Jan. 21 to 5:00 p.m. Fri., Jan. 22
Counselling of All Students by Advisers	Noon Thurs., Jan. 21 to 5:00 p.m. Fri., Jan. 22
Registration	8:00 a.m. to 5:00 p.m. Sat., Jan. 23
Instruction Begins	8:00 a.m. Mon., Jan. 25
Registration Closes	5:00 p.m. Mon., Feb. 8
Last Day to Withdraw without Grade	5:00 p.m. Mon., Feb. 8
Six Week Grade Reports	Wed., Feb. 10
Last Day for Making Up Incompletes	5:00 p.m. Mon., Mar. 8
Spring Recess	Begins 5:00 p.m. Thurs., Mar. 18 to 8:00 a.m. Mon., Mar. 22
Last Day to Submit Graduate Thesis	5:00 p.m. Thurs., Apr. 29
Campus Day (No Classes)	Fri., Apr. 30
Governor's Day	Sat., May 8
Examination Study Period (No Classes)	Fri., May 14
Semester Examinations	8:00 a.m. Sat., May 15 Noon Thurs., May 20
Final Senior Grades on File with Registrar	Noon Fri., May 21
End of Spring Semester	5:00 p.m. Fri., May 21
Final Grades on File with Registrar	5:00 p.m. Fri., May 21
Baccalaureate	Sun., May 23
Commencement	Mon., May 24

1965 Summer Session (Tentative)

Short Session	June 7-June 25, 1965
Regular Session	June 28-August 6, 1965
Post Session Workshop	August 9-August 13, 1965

Sources of Information

General News Information	University Relations
Admissions and Dormitory Applications	Director of Admissions and Registrar
Scholarships and Loans	Dean of Students
Part-Time Employment	Head, Student Employment
Graduate Work	Vice President for Research and Advanced Study
Summer Sessions	Head, Summer Sessions
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 1700 Hillcrest Drive Anchorage, Alaska
Ketchikan Community College	Director Box 378 Ketchikan, Alaska
Juneau Community College	Director 1250 Glacier Avenue Juneau, Alaska
Palmer Community College	Director Palmer Independent School District Palmer, Alaska
Sitka Community College	Director Box 179 Sitka, Alaska
Kenai Community College	Director Kenai High School Kenai, Alaska
Mailing Address for Main Office:	University of Alaska College, Alaska

TRANSPORTATION TO THE UNIVERSITY

The University of Alaska is located at College, Alaska, five miles from the city of Fairbanks. Bus transportation to College leaves a number of times each day from the Fairbanks Bus Depot. Taxi service is also available.

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

Student skiers pause in front of largest women's dormitory.

Registers

THE BOARD OF REGENTS

The Regents of the University of Alaska are appointed by the Governor and are confirmed by the Legislature.

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WILLIAM A. O'NEILL, Anchorage, *Vice President*, 1948-1965
DOROTHY A. WREDE, Fairbanks, *Secretary*, 1963-1971
JOHN J. CONWAY, Sitka, 1959-1967
BOYD C. HARWOOD, Nome, 1959-1967
ROBERT E. McFARLAND, Anchorage, 1963-1971
PHILIP H. MOORE, Sitka, 1954-1965
ARTHUR J. SCHAIBLE, Fairbanks, 1961-1969
WILLIAM R. WOOD, *President of the University, Ex-Officio Member*
CATHERINE L. BYRNE, *Treasurer, non-member official*

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HOWARD A. CUTLER, Ph.D., *Academic Vice President*
KENNETH M. RAE, Ph.D., *Vice President for Research and Advanced Study*
HOWARD A. BYRD, B.B.A., *Comptroller of the University*
EDWARD VOLDSETH, Ph.D., *Dean of Student Services*
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.Engr. (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, *Professor of the University, Emeritus*
Williams College '29, A.B. Harvard '33, M.B.A.; '37, D.Sc. (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, 1943-1963)

ACADEMIC FACULTY AND PROFESSIONAL STAFF 1963-64

SYUN-ICHI AKASOFU, *Associate Professor of Geophysics*
University of Tohoku '53, B.S.; '57, M.S. University of Alaska '61, Ph.D.

PAUL R. ALBEE, *Senior Research Assistant in Geophysics*
College of Idaho '61, B.S.

LEE ALLEN, *Instructor, Alaska Agricultural Experiment Station*
University of Idaho '57, B.S.

MICHAEL ALMASI, *Associate Engineer, Geophysical Institute*
University of Budapest '35, M.S. in Electrical Engineering

PHILIP ANAST, *Assistant Professor of Psychology and Head, Department of Psychology and Sociology*
Baylor University '41, B.A. in History; '46, M.A. in History; '54, M.A. in Psychology.
University of Wisconsin '60, Ph.D.

SOREN J. ANDERSEN, *Associate Electrical Engineer, Geophysical Institute*
University of Wisconsin '48, B.S. in Chem. Engr.; '49, B.S. in E.E.; '50, M.S. in E.E.

MARVIN J. ANDRESEN, *Assistant Professor of Geology*
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ZIAUDDIN AHMAD ANSARI, *Assistant Geophysicist*
Osmania University '48, B.S. University of Alaska '63, Ph.D.

LEO MARK ANTHONY, *Associate Professor of Mining Extension*
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KOBAD A. ARJANI, *Assistant Professor of Accounting*
University of Bombay '51, B.Com. University of Denver '57, M.B.A.

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Mankato State College '56, B.S.

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.

EUNICE E. BAILEY, *Instructor of Business Administration (Ketchikan)*
Oregon State College '25, B.S.

HANS-GEORG BANDI, *Associate in Archaeology*
University of Freiburg '45, Ph.D.

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University of Minnesota '31, B.S. University of Wisconsin '58, M.S.

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MARY L. GIRAUDO BECK, *Instructor of English (Ketchikan)*
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CLARENCE GEORGE BEERS, *University Buyer*

EARL H. BEISTLINE, *Dean, College of Earth Sciences and Mineral Industry, and Professor of Mining Engineering (P.E.)*
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JOHN P. DOYLE, *Instructor, Fisheries Extension*
University of Washington '59, B.S.

RICHARD C. DUGDALE, *Associate Professor of Marine Science*
University of Wisconsin '50, B.S.; '51, M.S.; '55, Ph.D.

NORMAN R. DUPON, *Instructor in Physical Education and Aquatic Supervisor*
University of Illinois '62, B.A.

TERRY C. EAKIN, *Assistant Professor of Political Science*
Denver University '54, B.A. University of Colorado '59, M.A.

CHRISTIAN T. ELVEY, *University Research Professor and Special Assistant to the President*
University of Kansas '21, A.B.; '23, M.A. University of Chicago '30, Ph.D.

BENSON T. FOGLE, *Assistant Geophysicist*
University of South Carolina '56, B.S.; '58, M.S.

ROBERT B. FORBES, *Associate Professor of Geology*
University of Washington '50, B.S.; '59, Ph.D.

DANNY P. FRASER, *Assistant Professor of Military Science*
Major, U.S. Army. Texas Western College '51, B.A.

EDGAR J. FREMOUW, *Senior Research Assistant in Geophysics*
Stanford University '57, B.S. University of Alaska '63, M.S.

RICHARD H. GAINES, *Assistant Professor of English (Anchorage)*
Texas Christian University '26, B.A. University of Southern California '62, M.A.

ALICE GATZKIEWICZ, *Assistant Comptroller*

E. J. GAUSS, *Assistant Professor of Electrical Engineering (P.E.)*
California Institute of Technology '54, B.S. University of Colorado '56, M.A. University of California at Los Angeles '60, M.S.

ALFRED H. GEORGE, *Assistant Comptroller for Research*
Oregon State University '50, B.S.

JOHN JAMES GOERING, *Assistant Professor of Marine Science*
Bethel '56, B.S. University of Wisconsin '60, M.S. University of Washington '62, Ph.D.

JOHN GOLISH, *Head, Student Activities, Employment and Housing*
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IVAR SKARLAND, *Professor of Anthropology and Geography and Head, Department of Anthropology and Geography*
University of Alaska '35, B.A. Harvard University '42, M.A.; '49, Ph.D.

EDMUND G. SKELLINGS, *Associate Professor of English*
University of Massachusetts '57, B.A. State University of Iowa '62, Ph.D.

HERMAN E. SLOTNICK, *Professor of History and Head, Department of History and Political Science*
University of Idaho '39, B.A. University of Washington '58, Ph.D.

DOUGLAS K. SMITH, *Supervisor, Computer Center, and Assistant Professor of Mathematics*
Stanford University '59, B.S. Harvard University '60, M.S.

DUNCAN WARD SMITH, *Instructor of Russian and French*
The Principian College '59, B.A. Middlebury College '62, M.A.

RALPH BURNS SMITH, *Assistant Professor of History (Ketchikan)*
Ohio State University '47, B.A.; '56, B.F.A. and B.Sc. Rice University '48, M.A.

WILLIAM P. SPENCER, *Instructor (Research) of Economics, Alaska Agricultural Experiment Station*
University of Delaware '61, B.S. University of Nevada '63, M.S.

GLENN STANLEY, *Assistant Engineer, Geophysical Institute*
Oregon State College '50, B.S.; '55, M.S.

RICHARD O. STENERSON, *Assistant Professor of Physics*
Iowa State University '57, B.S. University of Washington '60, M.S.; '63, Ph.D.

VICTOR STRASH, *Assistant Professor of History and Languages*
University of Washington '31, M.A.

DANIEL R. SULLIVAN, *Assistant Professor of Mathematics (Anchorage)*
University of Maine '51, B.A.; '59, M.A.

AGNES SUNNELL, *State Home Economics Leader and Associate Professor, Cooperative Extension Service*
University of Washington '30, B.S. Washington State College '44, M.S.

L. GERARD SWARTZ, *Associate Professor of Zoology*
University of Illinois '53, B.S.; '54, M.S.; '58, Ph.D.

WILLIAM J. SWEETMAN, *Professor (Research), Alaska Agricultural Experiment Station*
Michigan State University '22, B.S.; '25, M.S.

WILLIAM A. SWICK, JR., *Administrator and Lecturer, Civil Defense Education Project*
Allegheny College '48, B.A. Syracuse University '55, M.S.Ed.

DANIEL W. SWIFT, *Assistant Geophysicist*
Haverford College '57, B.A. Massachusetts Institute of Technology '59, M.S.

ROSCOE L. TAYLOR, *Associate Professor (Research), Agronomy, Alaska Agricultural Experiment Station*
South Dakota State College '48, B.S. Iowa State College '51, M.S.

JOHN A. TEAS, *Assistant Engineer, Geophysical Institute*

RACHEL A. THOMAS, *Assistant Professor of Physical Education*
Montana State College '51, B.S. University of Alaska '61, M.Ed.

WILLIAM R. THOMPSON, *Associate Professor of English*
Texas Christian University '48, B.A.; '50, M.A. Texas Technological College '57, Ph.D.

CHARLOTTE TOMPKINS, *District Home Demonstration Agent (Juneau) and Assistant Professor*
Oklahoma A. and M. '34, B.S. Colorado State University '48, M.S.

LESTER J. TORGERSON, *Assistant Comptroller for Management*
University of Idaho '47, B.S.

ANN TREMARELLO, *Assistant Registrar and Assistant Director of Admissions*
University of Alaska '57, B.B.A.

LUCILE L. TROST, *Associate Professor of Home Economics and Head, Department of Home Economics*
Brigham Young University '40, B.S. Utah State University '56, M.S. Texas Woman's University '59, Ph.D.

JOHN G. TRYON, *Professor of Electrical Engineering and Head, Department of Electrical Engineering*
University of Minnesota '41, B. of Physics. Cornell University '52, Ph.D.

PAUL TSCHINKEL, *Assistant Professor of Art*
Queens College '60, B.A. Yale University '62, B.F.A.; '63, M.F.A.

SHEILA J. TSCHINKEL, *Assistant Professor of Economics*
Hunter College '61, B.A. Yale University '62, M.A.

HELMUT G. VAN FLEIN, *Assistant Professor of Art and Head, Art Department*
Schwaebisch Hall Teachers College '44, B.Ed. Paedagogisches Institut Esslingen '48, M.Ed. Art Academy Stuttgart '51, M.F.A. University of Colorado '58, M.F.A.

PHILIP A. VAN VELDHUIZEN, *Assistant Professor of Mathematics*
Central College '52, B.A. State University of Iowa '60, M.S.

ELEANOR G. VIERECK, *Assistant Zoophysiologist*
Albion College '52, B.A. Smith College '55, M.A. University of Colorado '59, Ph.D.

EDWARD VOLDSETH, *Dean of Students and Professor of Psychology*
Montana State University '44, B.A. Columbia University '46, MA.. State University of Iowa '58, Ph.D.

RICHARD H. WASHBURN, *Associate Professor (Research), Entomology, Alaska Agricultural Experiment Station*
Michigan State University '41, B.S. Cornell University '45, Ph.D.

BETTY L. WATSON, *Dean of Women*
University of Denver '52, B.A. Columbia University '56, M.A.

ALBERT F. WEBER, *Instructing Technician, Electronics Technology Program*

MINNIE E. WELLS, *Professor of English*
University of Missouri '25, B.S. New York University '38, Ph.D.

EUGENE M. WESCOTT, *Senior Research Assistant in Geophysics*
University of California at Los Angeles '55, B.S. University of Alaska '60, M.S.

GEORGE C. WEST, *Assistant Professor of Zoophysiology*
Middlebury College '53, A.B. University of Illinois '56, M.S.; '58, Ph.D.

ARTHUR WILLS, *Associate Professor of English and Head, English Department*
Denver University '51, B.A. University of Kansas '58, Ph.D.

CHARLES R. WILSON, *Assistant Professor of Physics*
Case Institute of Technology '51, B.S. University of New Mexico '57, M.S. University of Alaska '63, Ph.D.

HELEN W. WILSON, *Librarian (Anchorage)*
University of Colorado '50, B.A. University of Denver, '63, M.A.

WILLIAM H. WILSON, *Assistant Professor of History*
University of Missouri '57, B.J.; '58, M.A.; '62, Ph.D.

WILLIAM S. WILSON, *Professor of Chemistry and Chemical Engineering and Head, Department of Chemistry and Chemical Engineering*
Brown University '31, Sc.B.; '34, Sc.M. Yale University '36, Ph.D.

ARTHUR WILTON, *Assistant Professor (Research), Agronomy, Alaska Agricultural Experiment Station*
University of British Columbia '40, B.S. University of Saskatchewan '54, M.S.

WILLIAM R. WOOD, *President of the University and Professor of English*
Illinois College '27, B.A.; '60, LL.D. University of Iowa '36, M.A.; '39, Ph.D.

LARRY C. WYATT, *Instructor of English*
University of Texas '59, B.A. Columbia University '61, M.A.

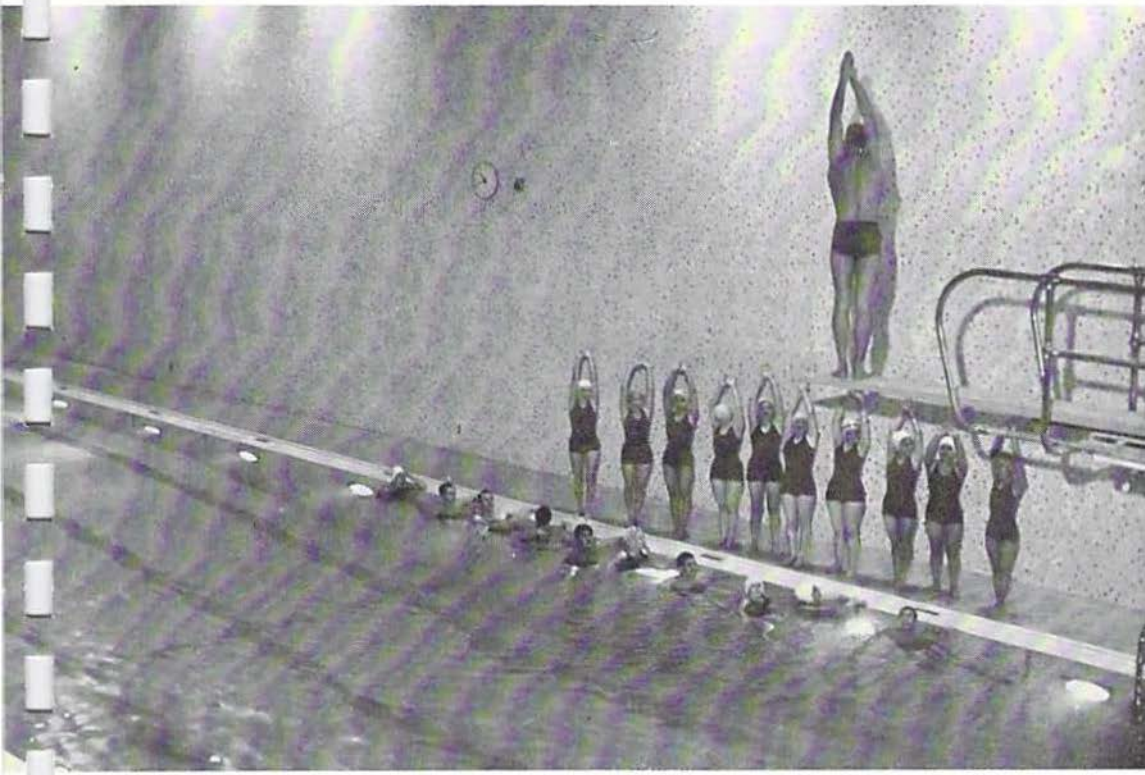
DELBERT L. YOCUM, *Instructor of Military Science*
Sergeant First Class, U.S. Army

MERLE J. YOUNG, *Supervisor, World Data Center and Data Processing*

CHESTER YOUNGBLOOD, *Assistant Professor of Education*
North Texas State University '49, B.A.; '51, M.Ed.; '61, Ed.D.

GERALD ZALTMAN, *Instructor in Business Administration*
Bates College '60, B.A. University of Chicago '62, M.B.A.

New collegiate-size pool and double gymnasium accommodates both classes and intramural program.



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 set up 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 and spirit which are necessary for life as a worthy human being in a democratic society.

ACCREDITATION

The University of Alaska 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 and the American Association of Colleges for Teacher Education.

The four-year curricula 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 of Alaska 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 of Alaska 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 fifth 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, former president of the University of Alaska, 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 Biological Sciences and Renewable Resources and 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, former chief Alaskan Geologist of the U.S. Geological Survey from 1903 to 1924.

The *Eielson Memorial Building* contains general classrooms, laboratories and offices of the College of Behavioral Sciences and Education and the College of Business, Economics and Government.

The *William E. Duckering Building* houses offices, classrooms and laboratories of the College of Mathematics, Physical Sciences and Engineering, the Zoophysiological Research Laboratory, 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.

Student Residences and Dining Facilities—*Harriet Hess Hall,* constructed in 1938, provides double and triple room accommodations for 62 men. The residence is named for the late Harriet Hess, secretary of the Board of Regents for many years.

Andrew Nerland Hall houses 100 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 100 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 100 women. It has 20 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, the largest of the University's residence halls, was completed in the spring of 1962 and 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.

A residence hall which will provide double and single room accommodations for 138 women is scheduled to be available for occupancy by the fall of 1964. It is the first of a 450-student residence and dining hall complex to be located west of the President's Residence.

Married student housing is provided in several areas. *Walsh Hall,* completed in 1959, has accommodations for couples with not more than one child. This spacious biulding 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.

Stuart Hall, an apartment building similar to Walsh Hall, is available to faculty members and graduate students. Stuart Hall was completed in 1955 and was named after the late Walter T. Stuart, former member and vice-president of the Board of Regents.

Scheduled for completion in the spring of 1964 are two apartment buildings which will house an additional 38 married student couples or families. All apartments will be furnished except for personal items such as dishes, utensils and bedding. Several two-bedroom apartments will be available for families with two or three children. One-bedroom apartments similar to those at Walsh and Stuart Halls will be assigned to couples without children, or with not more than one child. Still other quarters, without a separate bedroom, will be assigned to couples without children.

The *Trailer Court*, located on University property immediately adjacent to the campus, also is available for the use of married students. Space is rented to a restricted number of owners of trailers. Water, sewage disposal, and use of the utility house are included in the rental fee.

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.

Additional 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 spacious lounge with television and hi-fi sets. 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, employment and housing, and the speech, radio and drama facilities.

ENROLLMENT SUMMARY 1963-64 First Semester

	Men	*Women*	*Total*
Freshmen	263	149	412
Sophomores	134	64	198
Juniors	103	63	166
Seniors	97	32	129
Graduates	74	17	91
Without Class Standing	56	77	133
Post-Graduates	50	47	97
Total Number of Students	777	449	1226

ENROLLMENT DISTRIBUTION 1963-64 First Semester

Alaska	1002
Other States and U.S. Possessions	187
Foreign Countries	37
Total	1226

Division of Statewide Services

The Division of Statewide Services makes available to residents of the State, who are not enrolled as regular day students, credit and non-credit educational programs. Through its various departments classes are offered throughout the State and on the University campus in the evening. Non-credit programs and special services are also available on and off the campus.

Community Colleges—The University of Alaska serves the people of Alaska through six community colleges.

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 the fall of 1954, the third at Juneau-Douglas the fall of 1956, the fourth at Palmer the fall of 1961, the fifth at Sitka in the fall of 1962. A new Community College at Kenai will begin operation in 1964.

Through these colleges the University offers collegiate courses for academic credit. The courses and instructors are approved and supervised by the University and are offered in the late afternoon and evening, utilizing local school facilities. 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.

Students desiring detailed information on community college programs should write to the Resident Director of the Community College in which he is interested.

Evening, Off-Campus 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 Department activities is available by writing to the Department of Evening, Off-Campus and Correspondence Study.

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

A limited number of correspondence courses are available. For information and a catalog write to the Department of Evening, Off-Campus and Correspondence Study.

Summer Sessions, Conferences and Short Courses—The University holds sessions during the summer both on and off the campus. Three- and six-

week sessions are offered on the University campus. During the six-week session a wide range of subjects is available with main emphasis in the field of education. Wherever possible, Alaskan aspects of subjects offered are presented. The faculty consists of regular staff members and visiting professors. Both undergraduate and graduate work are offered. A maximum of seven hours of credit may be earned during the six-week session and no more than three hours of credit during the three-week session. Room and board is available on campus for single men and women and for married couples. An extensive recreation program is planned during the summer. Some of the activities are trips to Eskimo and Indian villages, gold panning expeditions, hiking and a boat trip.

Immediately following the summer session, a Workshop on Alaska is scheduled. This intensive five-day course deals with subjects such as anthropology, education, history, literature, art, agriculture and wildlife.

Summer Session programs are also offered by the community colleges as demand warrants.

The summer sessions bulletin, listing courses and fees is available after March 1 from the Department of Summer Sessions, Conferences and Short Courses.

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

Cooperative Extension in Agriculture and Home Economics—The program is administered from the University campus in cooperation with the United States Department of Agriculture. Local offices are maintained in Fairbanks, Palmer, Anchorage, Homer, Juneau and Nome. The program is designed to extend the results of research to people of all ages and needs.

District agricultural and home demonstration agents work closely with farm and rural families in fostering better living conditions and approved farm practices, and with local groups in improving economic conditions. Homemaker and 4-H Clubs are a part of the program.

Publications on homemaking, home yard improvement, gardening, management, agriculture, and buildings are available upon request from local and state offices. A building plan service is maintained. The Extension Service is financed through federal land-grant revenues and state appropriations.

Mining Short Course—The mining short course consists of classes in the practical aspects of geology, mineralogy, mineral preparation, prospecting, exploration and mining. Each class meets once a week for nine weeks on the campus during the fall semester. The course is open to all persons without regard to previous training and academic qualifications.

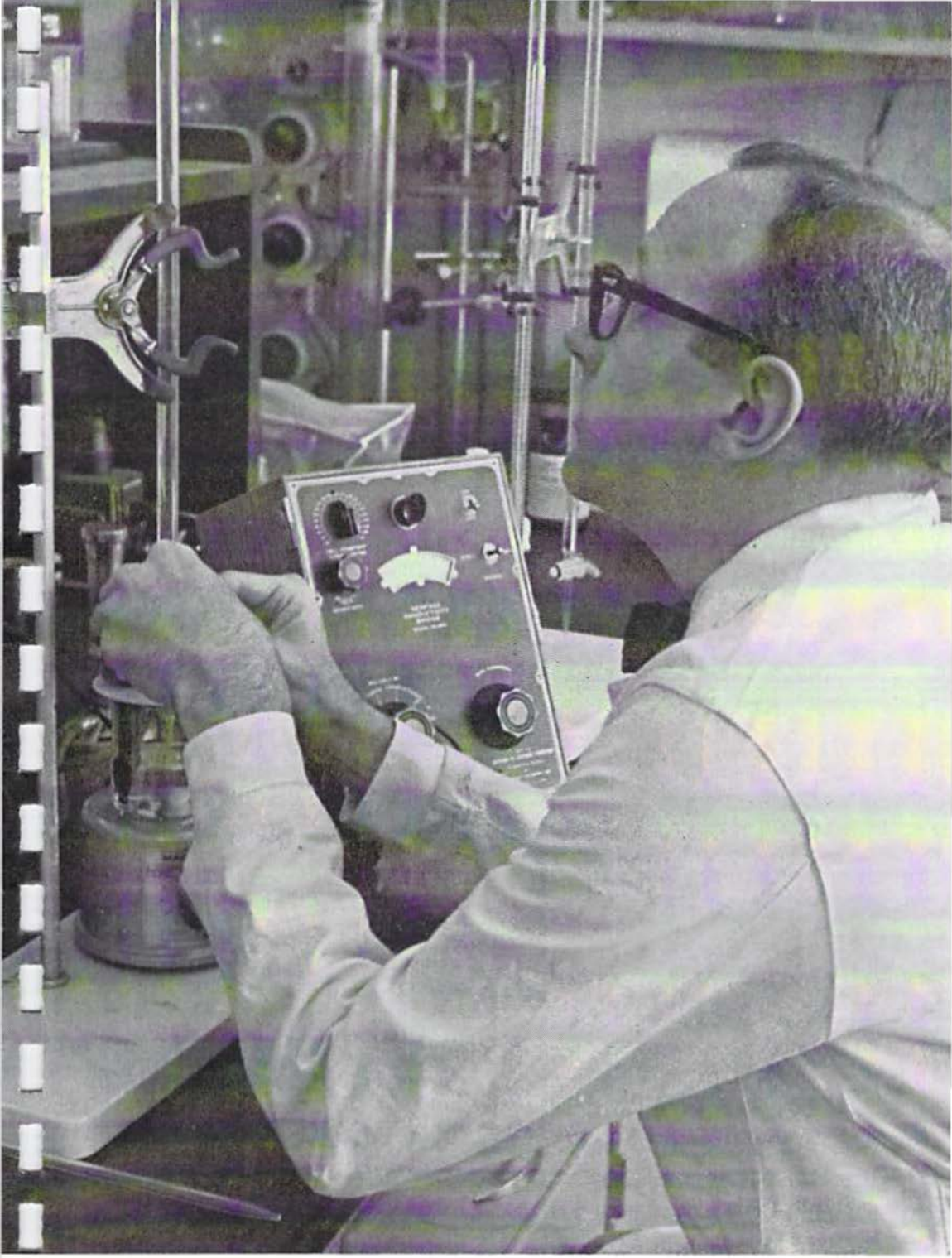
Mining Extension Courses—Extension courses in mining and mineral exploration are offered each year in various communities in Alaska. These courses are presented to give basic training in the various phases of the mineral industries and to help prospectors find and explore ore deposits. No college credit is given for such work, but an appropriate certificate is awarded to students who satisfactorily complete the respective course of study. Instruction is given by University faculty members.

Fisheries Extension Courses—The courses are designed to cover various aspects of commercial fishing. They are conducted in commercial fishing centers of the State. An appropriate certificate is awarded to all who complete the course.

National Science Foundation Institutes—A Summer Institute for junior and senior high school teachers of science and mathematics is held on the campus under a grant from the National Science Foundation. This is an eight-week institute offering stipends to approximately 50 participants.

A summer science training program for secondary school students, sponsored by the National Science Foundation, is held for six weeks on the campus during the summer.

Audio-Visual Communications—The Department has a large collection of 16-millimeter sound movies which are available to groups throughout the State. Requests for the film catalog should be mailed to the Department of Audio-Visual Communications.



Chemistry professor conducts research in cancer under national grant.

Research and Advanced Study

The research programs of the University of Alaska take advantage of its unique location; that is, its position 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—The University of Alaska and the United States Department of Agriculture conduct 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 professional training in wildlife management, research, education, and administration; investigates wildlife problems in Alaska; makes the results of these researches available through publication, radio, and personal contacts; and provides technical assistance to agencies concerned with wildlife management.

Graduate work leading to the M.S. degree in wildlife management may be performed at the Unit in cooperation with the Department of Wildlife Management.

Geophysical Institute—The Institute was formally established on July 1, 1949, as a department of the University of Alaska. 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 commenced in 1929 by means of a grant from the Rockefeller Foundation for auroral height measurements, through a steadily develop-

ing series of basic studies, to its present activities embracing many fields of arctic and sub-arctic research.

The purpose of the Geophysical Institute 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. Programs are also established in meteorology, glaciology, and seismology. 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 170, including some 30 graduate students in physics and geophysics who obtain their research training at the Institute.

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 and local value by a committee of eminent biologists, the Institute of Arctic Biology was established by action of the Alaska Legislature in 1963 for studies of life in the extreme climatic changes of arctic and subarctic regions. Temporarily housed in the Duckering Building, it will occupy substantial quarters in the new Biological Sciences Building under construction in the research area on the west ridge of the main campus.

The first component of the Institute, the Laboratory of Zoophysiology, began operation in October 1962. Three additional laboratories are projected for studies of man, animals, and plants in arctic and subarctic environments. Visiting scientists are received in the laboratories to which their investigations pertain. Opportunities for pre- and postdoctoral studies are provided.

Institute of Marine Sciences—The Institute was authorized in 1960 by the State Legislature. The purpose of the Institute 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. Scientists are invited to request permission to work in residence.

Institute of Business, Economic and Government Research—The Institute of Business, Economic and Government Research was authorized by the State Legislature in 1961. The purpose of the Institute 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.

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 re-

sources. Research is conducted in facilities of the College and coordinated with graduate student academic programs.

Naval Arctic Research Laboratory, Point Barrow—The University has contracted with the Office of Naval Research to operate the Point Barrow 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 during the past 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, and maintains a stock of Alaskan topographical maps for sale.

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—Instruments for the continuous registration of magnetic elements, installed originally by the Carnegie Institute of Washington, were turned over to the U.S. Coast and Geodetic Survey in 1948 and moved to the observatory which had been constructed for the purpose on the University campus in 1947. A new set of the latest type magnetic variometers with automatic recording equipment was installed at the observatory early in 1949.

The seismograph installation for the continuous registration of earth tremors was completed November 17, 1935, and has been in continuous

operation ever since. The station has been moved to a new twin seismograph vault built by the U.S. Coast and Geodetic Survey in 1949.

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.

Admissions

Admission of Alaskans—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.

Admission of Non-Alaskans—All non-residents of Alaska who seek admission to the University as freshmen are required to have a better than average high school record or to take the test 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. If the student resides in a part of the country where the ACT may not be administered, the University will accept College Entrance Examination Board scores in lieu of ACT scores.

Admission from Secondary School—A student offering the following pattern of studies will have no deficiencies in any program that he enters.

Subject	*Units*
English	3
Mathematics:	
Algebra	2
Geometry	1
Trigonometry	½
One Foreign Language	2
United States History	1
Physics or Chemistry	1
Natural or Social Science	1
Elective	4
TOTAL	15½

The specific entrance requirements of the six Colleges of the University are given below.

College	*English*	*Mathematics*	***Foreign Language*	*U.S. History*	*Natural or Social Science*	*Academic and Elective*
College of Arts and Letters	3	Algebra—1 Geom.—1	2	1	2	5
College of Behaviorial 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
(Plane geometry required of Education students who select teaching majors and/or minors in mathematics, chemistry, and/or physics.)						
College of Biological Sciences and Renewable Resources	3	†Algebra—2 Geom.—1 Trigonom.—½	0	1	Physics or Chemistry or Biology—1 Elective—1	7
(Two years of French, German, or Russian language highly recommended. See departmental curricula.)						
College of Business, Economics and Government						
Business Administration	3	2	0	1	2	7
Economics, History and 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.

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 A 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.

Admission of High School Seniors—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 of Alaska 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.

Admission of Non-High School Graduates—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).

Admission of 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 are filed.

Admission of Transfer Students—Transfer students from other accredited institutions are considered for admission provided they have a 2.00 grade point average and honorable dismissal. The University of Alaska 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.

Members of the Armed Forces who have taken USAFI courses may, upon presentation of credentials to the University's Director of Evening,

Off-Campus 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 Graduate and Post Graduate Students—See page 55.

Admission of 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.

How to Apply for Admission—Students who wish to attend the University of Alaska should write to the Director of Admissions and Registrar and request Application For Admission Forms. Students who expect to attend full time must present the following credentials, with the exception of the health form, before August 15 for the fall semester and January 1 for the spring semester. Applications received after these closing dates may be considered for the following semester.

1. *Application for admission.*
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. A catalog or set of course descriptions should accompany the transcripts. 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. *Medical and physical examinations.* Admission to the University also is dependent upon the applicant's having had a recent physical examination which will confirm that his health is sufficient to enable him to successfully undertake the course of study for which he is applying. This requirement applies to all new students and to all former students returning to the University after an absence of one year or more. The applicant's health record and examination report from the physician of his choice

must be received by the University Nurse before the student's acceptance may be assured. The report of a physical examination taken more than five months prior to the applicant's intended enrollment will be unacceptable to the University. Certification of immunity to or recent vaccination for smallpox must be included. At the time of registration, a tuberculin test is administered by the University Nurse.

4. *Photograph.* All candidates for admission should furnish a clear snapshot or photo, approximately two by three inches.
5. *Room reservations.* Students desiring dormitory rooms should complete the dormitory application form and return it and a $25 room deposit with their application for admission form.

Admission to the University for the purpose of earning scholastic credits becomes complete only when all credentials have been accepted.

Financial Information

FEES AND EXPENSES

Summary of Semester Charges

Full-time Students

Residents:	
Consolidated Fee	$ 82.50
Student Activity Fee	37.00
Yearbook Fee and Deposit	13.00
	$132.50
Dormitory Rent (double room)	$160.00
Meal Tickets (@ $95.00 per full mo.) (2nd sem. $365)	350.00
Residents Total Fees	$642.50
Non-Residents:	
All regular resident fees	$642.50
Tuition	150.00
Non-Residents Total Fees	$792.50

Yearbook fee and deposit are payable only once each year. All other charges are payable each semester.

Students normally will pay approximately the sums set forth 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 Consolidated Fee, and are not eligible for dormitory occupancy.

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

TUITION

Residents—Tuition is free to residents of Alaska. A resident is a person 19 years or older who has 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 who are not 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. Chil-

dren of military personnel who have been stationed in Alaska for more than one year are granted resident 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.

Consolidated Fee—Students registering for seven or more semester credit hours shall be charged a consolidated 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 consolidated 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.

PENALTIES

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).

Penalty for Failure to Preregister—Opportunity to preregister will be scheduled during each semester for the next semester following. At final registration time, a $5.00 penalty will be charged any returning student not having preregistered at the time scheduled.

MISCELLANEOUS FEES

Change of Registration—A charge of $1.00 shall be made for each change after the third day following the scheduled date for registration.

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.

STUDENT BODY FEES

The Associated Students of the University of Alaska, Inc. (ASUA), is the student organization for self-government and coordination of student activities. Undergraduate students carrying ten (10) semester credit hours or more, under 35 years of age, are required to pay the standard Student Activity Fee each semester, and the Yearbook Fee and Deposit once each year.

Semester Student Activity Fee	$37.00
Annual Yearbook Fee and Deposit	13.00

The Activity Fee includes, but is not restricted to, the following:

Activities Fund	Health Insurance
"A" Book	Student Publications: Polar Star, Denali
Varsity Athletics	Student Union Building Construction Fund

Of this sum, standard amounts are allocated to:

Health Insurance and Insurance Reserve	$ 9.00
Student Union Building Construction Fund	8.00

The Yearbook Fee, for publication of the "Denali," is payable only once each year. The fee includes a refundable deposit of $3.00 which will be returned to the student when his picture is taken for the Denali.

The Student Body fees are chargeable in full. No exceptions may be made because of disinterest in student activities, insurance personally carried, or inability to participate. Married students, if both are enrolled members of the Student Body, may purchase only one Denali.

DORMITORY AND DINING HALL CHARGES

Dormitory Deposits—A $25.00 dormitory application, reservation and damage deposit is required with the student application blank, and is retained throughout the period of residence.

Dormitory Rent—

On Double Room: $160.00 per semester

On Single Room: $185.00 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.

Meal Tickets—Each dormitory occupant is required to buy a meal ticket for cafeteria meals. The rate shall be $95.00 per full month. Meal tickets do not include vacation periods which occur during the semester. Full payment for a semester's meal ticket is required in advance. The first meal to be served for meal tickets will be dinner, September 14 in the first semester, and dinner, January 23, in the second semester.

PAYMENT OF FEES

All charges, deposits, rent and meals for the semester are payable in full in the second day following registration. Late settlement of fees is subject to a fine of $2.00 for each day following the day 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 monthly for the remainder in excess of institutional scholarships. 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.

Payment of Fees by Veterans and War Orphans—All eligible persons should receive prior approval from the VA and present it at the time of registration. Application forms and information can be secured at any Veterans Administration Office.

With the exception of the Vocational Rehabilitation Act (disabled veterans) eligible persons pay school expenses directly to the Comptroller's Office, as other students do. The monthly training allowance checks are mailed by the VA approximately three weeks in arrears so students should plan their financial affairs accordingly.

Eligible persons who wish to transfer to the University of Alaska from another school should make application to and receive prior approval from the VA for in some cases there are limitations on a transfer from one school to another. Also, the allowance payment is contingent upon the timely receipt in a VA Office of a completed application for Change of School and/or Program of Training.

The final termination date for the Korean GI Bill training benefit is January 31, 1965, so eligible veterans should be guided accordingly in planning a continuity of their program so as to receive the maximum entitlement.

Refundable Charges—Refunds, of the consolidated fee, tuition fee, music course fees and ASUA 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 per cent refund

Withdrawal within the first 1/3 of term—50 per cent refund

Withdrawal after first 1/3 of term or semester—no refund

Miscellaneous fees shall not be subject to refund

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

Rent—Room rent is refundable, upon recommendation of the Dean of Students, only in emergency cases, such as illness.

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 Session and Home Economics Short Course students, as well as to 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 Session 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 safekeeping and certification.

SCHOLARSHIPS

At the present time, scholarships 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 in any of the University's Community Colleges and who plan to continue their study on the main campus at College during a forthcoming semester are invited to apply.

Applications from currently enrolled students are accepted twice each year before March 15 and November 15. Applications from Alaska high school seniors are accepted once each year before March 15 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 the Dean of Students.

Scholarship recipients at the University of Alaska forfeit entire scholarships which are to become effective in a forthcoming semester if they earn below a 2.0 grade point average in the current semester. Scholarships are automatically forfeited by recipients who do not enroll during a semester in which the scholarship is in effect, who enroll for less than a full-time program of studies without special arrangement, who are placed on disciplinary probation or who are suspended from the University for disciplinary reasons.

Questions concerning application forms, specific scholarships, or selection procedures should be directed to the Office of the Dean of Students.

Although numerous scholarships are awarded annually to students at the University of Alaska by generous individuals and organizations, the list below includes only those scholarships which were administered by the University's Scholarship Committee during the 1963-64 school year:

Name of Scholarship	*Number*	*Total Amount*
Alaska National Guard Officers Association	Two	$ 1000
Alaska Native Scholarships	Varies	21,125
Albrecht Memorial, Major George	One	100
Fairbanks Kiwanis Club "Andy Anderson Memorial"	One	500
Fairbanks Kiwanis Club "Foreign Student Scholarship"	One	500
First National Bank of Fairbanks	Two	1000
General Motors	Four	Varies
Henderson Estate, John B.	Four	1600
Hess Estate, Harriett	Two	880
Hess Estate, Luther	Three	1200
Hoffer Glass Company	One	125
Hoitt, Grace	One private music lesson per week	
Kennecott Copper Corporation	One	1000
Ketchikan Pulp Company	One	500
Lathrop Estate, Austin E.	Varies	6000
Leach Estate, Frank M.	One	500
Loussac Foundation	Varies	1800
McIntosh Estate, Jessie O'Bryan	Varies	12,000
Mikami Memorial, George and Mine	One	300
National Bank of Alaska	Varies	1000
National Electrical Contractors Assoc., Inc.	One	500
New England Fish Company (Dr. W. L. Rogers)	One	500
Northern Commercial Company	One	500
Oyoumick Memorial, Stanton	One	50
Phipps, Margaret R.	Four	600
Pictures, Inc.	One	100
Pioneers of Alaska Memorial, Igloo #4	One	300
Radio Corporation of America	One	800
Sears-Roebuck Foundation	Four	1200
Sheppard Trading Company, Inc.	One	500
Southwestern Alaska Section, AIME	One	400
State Room Scholarships	Varies	14,500
United States Smelting, Refining and Mining Company	One	250
University of Alaska Alumni Association	One	300

STUDENT LOAN FUNDS

No student should enroll without sufficient funds to defray the expenses of one entire academic year. Occasionally, however, a student's estimate of his year's expenses proves inadequate, and he needs financial assistance to complete the term. The University has several loan funds for this purpose.

The Student 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)
Lawrence C. Phipps (1930)
Fairbanks High School Alumni (1932)
Sheils-Timson (1936)
Leopold F. Schmidt (1938)
Palmer Associated Students (1941)
Frank Slaven (1944)
First National Bank (1945)
Phi Tau Gamma (1953)
Palmer Community (1953)
Glen Carrington (1953)
Larry Doheny (1953)
Pioneer Women of Alaska (1954)
Women's Auxiliary #4, Pioneers of Alaska (1957)
Verne E. Roberts Memorial (1960)
James Stanley Rodebaugh Memorial (1960)
James E. Nankervis Memorial (1961)
Herman Turner Memorial (1961)

The interest rate on money borrowed from the Student Fund is 4 per cent per annum. Loans are limited to $500 and are payable prior to the forthcoming September first. Any regularly enrolled student who has successfully completed at least one semester as a full-time student at the University of Alaska may apply for aid. The loans require an approved surety and will be made for University expenses only, such as room, board, fees, and books.

The Emergency Loan Fund (comprised of the following separate funds: Fairbanks Rotary Club Bernie Carr Memorial, University of Alaska Alumni Association, Allen McDaniel Memorial, Summit Publication, Mildred Herman Project, and the Pappy Walker Memorial) is available to all regularly-enrolled full-time students whose financial need is modest and temporary. The Emergency Loan requires no surety, is limited to $100 for not more than 30 days, and the interest is in the form of a flat service charge of $2 per loan (or 50¢ if repayment is made within ten days of the date of borrowing).

Through the National Defense Education Act of 1958, federal aid was made available to the University of Alaska and other institutions to assist in the establishment of long-term, low-interest loan funds from which a limited number of needy and qualified students may borrow money to pursue their college education. Applicants who intend to teach in the elementary or secondary schools and/or who have demonstrated ability in mathematics, science, engineering, or a modern foreign language will be given preference. Information about this program may be obtained from the Office of the Dean of Students.

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 a 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.

Dean of Students presents red roses to women with high scholastic standing at honors convocation.

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 twofold: 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 curricula 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 because experience has shown that absences tend to lower grades. 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 semester hours provided the student's grade point average with a full time study load for the past two semesters is 2.75, or more, 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 "general," whether he be a full-time or a part-time student.

All "special" students are considered to be "general" 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 changing courses 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 is 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 posponed 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 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. Completion of two or more college level courses with a grade of C or higher at another accredited institution or by correspondence is the recommended and preferred requisite for re-admission to the University.

Any first-year student who registers for 18 or 19 credits during his first semester must maintain satisfactory standing in each of the courses he is carrying or he will be required to reduce his program of studies.

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 other 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 the Dean of Students, 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
Boswell Memorial Award, Marion Frances
Chemistry Department Outstanding Freshman
Druska Carr Schaible Memorial Award
Fairbanks Garden Club Conservation Award
Fairbanks Weavers Guild
McLaughlin Memorial, George M.
Shiels Prize, Archie W.
Sigma Xi Club, University of Alaska
Steese Prize, General James

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

Student Personnel Services

GENERAL REGULATIONS AND INFORMATION

The University reserves the right to alter the requirements for admission or graduation, to institute or withdraw courses, and to change or establish any regulation affecting students. Such new conditions will become operative when the proper authorities decide and may apply to all students, whether previously registered or not.

Student Conduct—Education at the University of Alaska is conceived as training for citizenship as well as for personal self improvement and development. When a student enrolls in the University, he acquires a special status and prestige and assumes commensurate 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 of Alaska's policy to give 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 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 of 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 all students in the Office of the Dean of Students. To those who live in University residence halls, manuals containing housing regulations will be distributed at the time rooms are occupied.

University regulations try 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 for enforcing the rules.

STUDENT PERSONNEL SERVICES

The University of Alaska provides services intended to assist students in making their educational careers more profitable and pleasant. 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 development of the whole student, the University continues to expand its guidance facilities to meet the need for individualization in the educational process.

The Office of the Dean of Students, through its staff, is responsible for coordinating and extending personnel services such as the following: a) orientation activities to help new students to adjust to the privileges and responsibilities of membership in the University community; b) psychological testing to help students to 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 extracurricular activities and organizations; and h) the promotion of high standards of student conduct.

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 of Alaska takes pride in providing the student with carefully planned and supervised modern facilities which help promote maximum educational and social development.

All student rooms are trim, light, and of ample size. Each student has his own bed, desk, chair, tackboard, 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 in a dormitory 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 the Dean of Students before the beginning of any semester. Men students of sophomore standing or higher may live in a dormitory if space permits. Full-time students will be given preference over part-time students in the assignment of dormitory accommodations.

All dormitory residents are required to contract for their meals by the semester at the University Commons. Breakfast, luncheon, and dinner are served daily throughout the school year. Although meal service continues during the Thanksgiving and Christmas 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 three consecutive days, a refund for the fourth and subsequent days may be recommended by the Office of the Dean of Students.

Application for domitory rooms should be made at the same time as the application for admission to the University is submitted. Application blanks are available upon request from the Registrar and should be returned to that office. The actual assignment of rooms is the responsibility of the Office of the Dean of Students. A residence hall reservation will not be confirmed until a student's application for admission to the University has been approved. A $25.00 deposit must accompany the dormitory application. This deposit is refundable if the applicant's admission to the University is denied. Similarly, the deposit is refundable if cancellation of a dormitory reservation is made by August 1 for the fall semester, by December 15 for the spring semester, or by May 1 for the summer session. A full refund, less any charges for damages or other unpaid obligations to the University, will be made if the student remains in occupancy throughout the period covered in his reservation. However, no refund will be made—either of the deposit or of prepaid rent, if the student withdraws during the period covered by his contract. Unless written notification of late arrival is received by the Office of the Dean of Students from a student for whom dormitory space is reserved not later than the first day of classes in any semester, the reservation will be canceled and the space assigned to a waiting list applicant.

CO-CURRICULAR ACTIVITIES

All University 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, yearbook, 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 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 bona fide students of the University.
2. Students who participate in an activity which necessitates absence from regularly scheduled classes must not be on academic or disciplinary probation.
3. Special eligibility regulations 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 the Dean of Students. The responsibility for enforcing special eligibility regulations shall rest with the organization or department.

4. The Academic Vice President and the Dean of Students shall review special cases or unusual circumstances regarding eligibility regulations and, with the approval of the President of the University, may modify the above regulations.

ALUMNI SERVICES

The University of Alaska Alumni Association promotes interest in the University and acquaintanceship among former students of the University in an effort 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, College, Alaska.

Former students who have taken credit courses at the University of Alaska or any of its Community College and Off-Campus Centers are eligible to belong to the Association. Dues are $1 annually, plus chapter dues for those who are such members. 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 of Alaska 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.

Degrees

DEGREES OFFERED

The University of Alaska 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. (Electronic Technology)
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 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.

The student 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.

Students must be in residence during the year preceding graduation. Students must earn twenty-four credits in the required upper division subjects.

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

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

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 and Tactics.)

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, preferably during the first two years of attendance at the University.

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

A student may elect to graduate under the catalog which is in force during the year of his graduation or the previous year.

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. 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.	12-16
Social Science, including Hist. 117-8 and work in two other fields	15
Mathematics and/or Natural Science, Math. 101-2 or a year sequence in a laboratory science plus enough credits to total 12.	12
Major Specialty—(See Departmental Sections for specific requirements.) 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.	23-36
Minor Specialties—2 of 12-18 credits each, or a second major to be approved by petition.	23-34
Physical Education or Military Science	4-6
Electives—To bring total credits to 130 credits.	

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

MINOR SPECIALTIES AVAILABLE FOR B.A. DEGREE—Anthropology, Art, Biological Sciences, Botany, Chemistry, Classics (Greek, Latin), Economics, 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 335, 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. 231-2, P.S. 101-2	15
Economics including Econ. 121-2, 322, 323, 350, 425, 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)	12-15
Approved Electives (15-20 credits) to total 130 credits.	

GENERAL REQUIREMENTS FOR A B.Ed. DEGREE

For requirements for a B.Ed. in Elementary Education, see page 65.
For requirements for a B.Ed. in Secondary Education, see page 66.

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. 101, 102, 201, 202, 302, 312	22
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 131.

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, General Science, Geography, Geology, Geological Engineering, Geophysics, Home Economics, Mathematics, Medical Technology, Metallurgical Engineering, Mining Enginering, Physics, Pre-Medicine, 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.

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, 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. No lower division courses and not more than nine semester hours of upper division courses may be applied toward the degree. A maximum of nine semester graduate 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 (500, 600, and 700) 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 fulfilment 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 of Alaska, 3) meeting his foreign language requirement, 4) obtaining approval by his Advisory Comittee 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 disseration, 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 fulfilment 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.

POST GRADUATE STATUS

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."

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

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 English, French, German, Linguistics, Music, Russian, and Speech. The College offers minors for the Bachelor of Arts in these subjects and in Art, Classics (Greek, Latin), Journalism, Philosophy, and Spanish.

GRADUATE DEGREES—The College of Arts and Letters offers a Master's Degree in English.

ART DEPARTMENT

HELMUT G. VAN FLEIN—DEPARTMENT HEAD

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.

A minor in Art requires 12 hours of approved Art courses.

For course descriptions, see page 104.

ENGLISH DEPARTMENT

ARTHUR WILLS—DEPARTMENT HEAD

DEGREES—BACHELOR OF ARTS AND MASTER OF 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; and 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 54.
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 descriptions, see page 124.

REQUIREMENTS FOR A M.A. DEGREE IN ENGLISH

1. A minimum of 30 credits of approved courses including English 697, Thesis, 6 credits.
2. Completion of the general graduate degree requirements listed on page 55.

For course descriptions, see page 124.

JOURNALISM AND CREATIVE WRITING DEPARTMENT

CHARLES J. KEIM—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 chief 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.

The first two years of the curriculum in English, including the minor consisting of 12 credits in Journalism, embody the essentials of the first two years of a curriculum in Journalism.

The Journalism and Creative Writing Department offers elective courses leading to a minor in Journalism.

For course descriptions, see page 136.

LINGUISTICS AND FOREIGN LANGUAGES DEPARTMENT

BRUCE R. GORDON—ACTING DEPARTMENT HEAD

DEGREE—BACHELOR OF ARTS

MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS

Educated Americans need to know the best that has been thought and said, not only in their own language, but also in other languages. Whether it be Eskimo or English, the language of a people embodies its unique culture, its unique way of thinking and feeling. Linguistics embraces all languages, as a science of language. The study of linguistics and foreign languages opens the way to a broader and deeper view of culture, liberates the student from the confines of his own culture, at the same time making 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, and Russian.

For a major in French, German, or Russian:

1. Complete general requirements for a B.A. degree as listed on page 54, including foreign language requirement.
2. Complete 23 credits in language beyond French, German, or Russian 101, not duplicating foreign language requirement.
3. Complete 3 credits in a Linguistics course.

A minor in French, German, Greek, Latin, Russian, or Spanish requires 4 semesters of study (12-16 credits) in that language, not duplicating the language credits used for fulfillment of the foreign language requirement for the B.A. degree.

For a major in Linguistics:

1. Complete general requirements for a B.A. degree as listed on page 54, 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.

MUSIC DEPARTMENT

PAUL McINTYRE—DEPARTMENT HEAD

DEGREE—BACHELOR OF ARTS

MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS

"We attach a supreme importance to a musical education, because, more than anything else, rhythm and harmony find their way into the innermost recesses of the soul."
Plato: "The Republic," Book III

MUSIC CURRICULUM

Prerequisite: Freshman students must take Music A and B, or show a knowledge of the subject matter of those courses before proceeding to Music 131.

Singers and instrumentalists must be able to perform major and minor scales and arpeggios, and, in addition, to fulfill the following requirements:

For Pianists and Organists: (1) To perform the first movement of a sonata by Haydn, Mozart, or Beethoven, or a similar work from the organ literature, chosen by the candidate and prepared beforehand. (2) To read at sight a simple hymn tune in four parts.

For other Instrumentalists: To play a passage of medium difficulty chosen by the examiner from the symphonies of Haydn or Mozart. Candidates will be allowed to examine the passage for ten minutes prior to being called upon to play it.

For Singers: (1) To read at sight the melody and words of a simple hymn tune. (2) To perform selections of the candidate's choice from the standard opera and concert repertory.

Students failing to meet the prerequisites in performance must take remedial work under Music 151 without credit.

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

For a major in Music:

1. Complete general requirements for a B.A. degree listed on page 54.
2. Complete 36 credits in Music. Instrumentalists must complete the following 30 credits of general requirements and 6 credits of specialized requirements:

(1) GENERAL REQUIREMENTS:

Chorus 101, 102	2 credits
History and Literature 121-2, 221-2, 321-2, 421-2	8
Theory and Composition 131, 132, 231, 232	8
Private Lessons 161-2, 261-2, 361-2, 461-2	8
Form and Analysis 323, 324	2
Senior Seminar 491 or 492	2
	30 credits

(2) SPECIAL REQUIREMENTS:

a. For Pianists:

Chamber Music 307, 308	4 credits
Accompaniment 363, 364	2
	6 credits

b. For Organists:

Improvisation 333, 334	2 credits
Church Music 423, 424	4
	6 credits

c. For Other Instrumentalists:

Chamber Music 307-8, 407-8	4 credits
Piano 151-2, 251-2 (or prerequisite pianists' examination noted above)	2
	6 credits

d. Singers will follow the same General Requirements as instrumentalists, with the exception of Theory and Composition 231-2, and Form and Analysis 323-4. They will also take the following:

Vocal Repertory 363-4, 463-4	4 credits
Piano 151-2, 251-2 (or prerequisite pianists' examination noted above)	2
Opera Workshop	6
	12 credits

A minor in Music requires 12 credits in Music beyond Freshman courses, including two semesters of History and Literature of Music and four semesters of private lessons on an instrument or in voice.

For course descriptions, see page 144.

MUSIC CURRICULUM

FALL SEMESTER

FIRST YEAR — **15-18 CREDITS**

Engl. 101—Comp. & Modes of Lit.	3
Foreign Language 101 or 201	3-5
History 117	3
P.E. or ROTC	1-1½
Music 101—Chorus	1
Music 121—Hist. & Lit. A	1
Music 131—Theory & Comp. A	2
Music 161—Private Lesson	1
Music 151—Piano (where applicable)	½

SECOND YEAR — **13½-17½ CREDITS**

English	3
Foreign Language 201 or 493	3
Lab. Science or Math. 101	4-5
P.E. or ROTC	1-1½
Music 221—Hist. & Lit. B	1
Music 231—Theory & Comp. B (Except singers)	2
Music 261—Private Lesson	1
Music 363—Accompaniment (Pianists only)	1
Music 251—Piano (where applicable)	½

THIRD YEAR — **13-14 CREDITS**

Music 321—Hist. & Lit. C	1
Music 323—Form & Analysis (Except singers)	1
Music 361—Private Lesson	1
One of	
Music 309—Chamber Music Music 333—Improvisation Music 363—Vocal Repertory	1
Opera Workshop (Singers)	3
First Minor	3
Second Minor	3
Soc. Sci. Elective (2nd Field)	3

FOURTH YEAR — **14-15 CREDITS**

Music 421—Hist. & Lit. D	1
Music 461—Private Lesson	1
Music 491—Senior Seminar	2
Either:	
Music 423—Church Music	2
Or one of:	
Music 409—Chamber Music Music 463—Vocal Repertory	1
First Minor	3
Second Minor	3
Soc. Sci. Elective	3

SPRING SEMESTER

15-18 CREDITS

Engl. 102—Comp. & Modes of Lit.	3
Foreign Language 102 or 202	3-5
History 118	3
P.E. or ROTC	1-1½
Music 102—Chorus	1
Music 122—Hist. & Lit. A	1
Music 132—Theory & Comp. A	2
Music 162—Private Lesson	1
Music 152—Piano (where applicable)	½

13½-17½ CREDITS

English	3
Foreign Language 202 or 494	3
Lab. Science or Math. 102	4-5
P.E. or ROTC	1-1½
Music 222—Hist. & Lit. B	1
Music 232—Theory & Comp. B (Except singers)	2
Music 262—Private Lesson	1
Music 364—Accompaniment (Pianists only)	1
Music 252—Piano (where applicable)	½

13-14 CREDITS

Music 322—Hist. & Lit. C	1
Music 324—Form & Analysis (Except singers)	1
Music 362—Private Lesson	1
One of	
Music 310—Chamber Music Music 334—Improvisation Music 364—Vocal Repertory	1
Opera Workshop (Singers)	3
First Minor	3
Second Minor	3
Soc. Sci. Elective (3rd Field)	3

12-13 CREDITS

Music 422—Hist. & Lit. D	1
Music 462—Private Lesson	1
Either:	
Music 424—Church Music	2
Or one of:	
Music 410—Chamber Music Music 464—Vocal Repertory	1
First Minor	3
Second Minor	3
Science Elective	3

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. Students who wish a minor in Philosophy must take courses approved in advance by the Head of the Department of Philosophy. A minor in Philosophy requires 15 credits.

For course descriptions, see page 147.

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 Theatre and Radio 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.

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

1. Complete general requirements for a B.A. degree listed on page 54.
2. Complete 20 credits in Speech beyond Speech 251, including:
   - Speech 253—Phonetics ..... 2 credits
   - Speech 254—Voice and Diction 2
   - Speech 261—Introduction to Broadcasting 3
   - Speech 301—Introduction to the Theatre 3
3. A minor in Speech requires 12 credits of approved Speech electives.

For course descriptions, see page 161.

College of Behavioral Sciences and Education

CHARLES K. RAY—DEAN

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

UNDERGRADUATE DEGREES—The College of Behavioral Sciences and Education 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

IVAR SKARLAND—DEPARTMENT HEAD

DEGREES—BACHELOR OF ARTS AND BACHELOR OF SCIENCE

GRADUATE STUDY

See page 55.

MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS

The Department of Anthropology and Geography offers courses on the undergraduate level in Anthropology and Geography. A major can be obtained in both fields.

The Department of Anthropology and Geography offers courses of instruction and opportunities for research. Anthropology and Geography contribute to an understanding of the complex problems of human behavior, cultural, 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 54.
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—Central and South American Ethnology 3
   - Anth. 342—Alaska Natives 3
   - Anth. 423—Social Anthropology 3
3. Complete the following:
   - Soc. 102—Introduction to Sociology 3
   - Psy. 201—General 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 102.

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 54.
2. Complete 20 credits in geography beyond Geography 101, including:
   - Geog. 201—Elements of Physical Geography ..... 3 credits
   - 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:
   - W.M. 102—Conservation of Natural Resources 2
   - Biol. 303—Principles of Ecology 3
   - Geol. 201—General Geology 4
   - Geol. 202—Historical Geology 4
   - Anth. 101—Introduction to the Study of Man 3
   - Anth. 212—Human Origins 3
   - Plus one Anthropology elective

A minor in Geography requires 12 hours of approved Geography courses.
For course descriptions, see page 127.

EDUCATION DEPARTMENT

CECIL W. MARTIN—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 professional work 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 are offered which provide information and practice in the development of instructional materials and the understanding of methods of instruction.

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 departments of education. In Alaska, certificates are granted by the Alaska Department of Education in Juneau. Students who obtain the Bachelor of Education Degree will be qualified to meet Alaska's requirements. Students seeking a minor in Education should consult the Department Head for specific requirements.

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, Classics, English, Journalism 431 and 432, Languages, Linguistics, Music, Philosophy, Speech) 20
   - a. Required Courses:
     - English 101 and 102—Composition and Modes of Literature 6
   - b. Recommended Courses:
     - English 313—Advanced Exposition 3
     - Music 343—Music Education 3
     - Speech 251—Public Speaking I 2
     - Philosophy 201—Introduction to Philosophy 3
3. Social Sciences (Anthropology, Economics, Geography, History, Political Science, Psychology, Sociology) 24
   - a. Required Courses:
     - Approved History Courses 6
     - Psychology 101-102—General Psychology 6
     - Psychology 301—Child Development 3
     - Political Science 101-102—American Government or Approved Political Science substitute 6
   - b. Recommended Courses:
     - Anth. 342—Alaska Natives 3
     - Economics 121 and 122—Principles of Economics 6
     - Geog. 101—Introduction to Geography 3
     - History 343—History of Alaska 3
     - Sociology 101-102—Introduction to Sociology 6

4. Mathematics 7
   The two following courses or approved math substitutes:
   - Math. 115—Foundations of Math 4
   - Math. 205—Mathematics for Teachers 3

5. Physical and/or Natural Sciences (includes Geography 201 and 401) 6
   Six credits from the following courses or approved Science substitutes:
   - Biog. 105 and 106—Fundamentals of Biog. 8
   - Chem. 103 and 104—Introductory Chemico-Physical Science 6-8
   - Geog. 201—Elements of Physical Geog. 3
   - Geog. 401—Weather and Climate 3

6. Education 28
   a. Required Courses:
   - Ed. 313—Educational Psychology 3
   - Ed. 332—Tests and Measurements 3
   - Ed. 409—The Teaching of Reading 3
   - *Ed. 452—Directed Teaching 6

   * Candidates who have taught successfully three years in the public schools may be excused from Education 452.

   b. Eight credits from the following courses:
   - Ed. 202—Audio-Visual Education 2
   - Ed. 206—Teaching of Arithmetic 2
   - Ed. 301—Social Studies 3
   - Ed. 302—Language Arts 3
   - Ed. 304—Literature for Children 3
   - Ed. 306—Teaching of Science in Elementary Schools 3
   - Ed. 323—Small Schools 2

   c. Five credits from the following courses:
   - Ed. 121—Introduction to Education 2
   - Ed. 345—Social Foundations of Learning 3
   - Ed. 348—History of Education in the United States 3
   - Ed. 422—Philosophy of Education 3
   - Ed. 426—Principles and Practices of Guidance 3

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	History
*Art	Linguistics
Biological Sciences	Mathematics
Chemistry	Music
*Classics	*Philosophy
Economics	*Physical Education
English	Physics
Foreign Languages	Psychology
Geography	Speech
Geology	Sociology

   * Approved for a maximum of 18 credits.
   Credits earned in fulfillment of (2), (3), (4), and (5) above may be applied toward courses listed above (7).

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, Classics, English, Journalism 431 and 432, Languages, Linguistics, Music, Philosophy, Speech) 20
   a. Required Courses:
   - English 101 and 102—Composition and Modes of Literature 6

   b. Recommended Courses:
   - English 313—Advanced Exposition 3
   - Speech 251—Public Speaking I 3
   - Philosophy 201—Introduction to Philosophy 3

3. Social Sciences (Anthropology, Economics, Geography, History, Political Science, Psychology, Sociology) 24
   a. Required Courses:
   - Approved History Courses 6
   - Psychology 101-102—General Psychology 6
   - Psychology 301 or Psychology 302 3
   - Political Science 101-102—American Government or Approved Political Science substitute 6

b. Recommended Courses:

Anthropology 342—Alaska Natives	3
Economics 121 and 122—Principles of Economics	6
Sociology 101 and 102—Introduction to Sociology	6
History 343—History of Alaska	3

4. Mathematics, Natural Sciences, and Physical Sciences 8
   Eight credits from the following courses or approved substitutes:

Biog. 105 and 106—Fundamentals of Biog.	8
Chem. 103 and 104—Introductory Chemico-Physical Science	6-8
Math. 103 and 104—Survey of College Mathematics	6
Math. 115—Foundations of Mathematics	4

5. Education 28

a. Required Courses:

Ed. 313—Educational Psychology	3
Ed. 321—The Secondary School	3
Ed. 332—Tests and Measurements	3
Ed. 402 or 407 or 408—Methods	3
*Ed. 452—Directed Teaching	6

* Candidates who have taught successfully three years in the public schools may be excused from Education 452.

b. Six credits from the following courses:

Ed. 121—Introduction to Education	2
Ed. 202—Audio-Visual Education	2
Ed. 301—Social Studies	3
Ed. 345—Social Foundations of Learning	3
Ed. 348—History of Education in United States	3
Ed. 422—Philosophy of Education	3
Ed. 426—Principles and Practices of Guidance	3
Ed. 431—Curriculum Development	3

6. Teaching Majors and Minors 42

Option A: Complete a teaching major of 24 credits (including 12 advanced credits) and a teaching minor of 18 credits.

Option B: Complete a teaching major of 42 credits, of which 24 credits must be in one field (including 12 advanced credits) and the balance in approved related fields.

Option C: Complete a teaching major of 25 to 30 credits (including 12 hours of upper division) and a teaching minor of 12-17 credits for a total of 42 credits.

Teaching majors and teaching minors may be completed in any of the following subjects or teaching fields:

Major or Minor	Major Only (Option B)
Biological Sciences	General Science
Business Administration	Social Science
Chemistry	**Minor Only**
English (not including Engl. 101, 102)	Art
**Foreign Language	Classics
Home Economics	*Economics
Mathematics	*Geography
Music	Journalism
Physical Education	*Political Science
Physics	*Sociology
Speech	

* Approved for History Major only.

** Confer with Head of the Department of Education.

Credits earned in fulfillment of (2), (3), and (4) above may be applied toward the teaching major or teaching minor. All majors and minors must be approved by the Head of the Department of Education.

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.

TEACHING CERTIFICATES FOR MAJORS IN OTHER DEPARTMENTS

All education majors and majors in other departments who wish to obtain an Alaskan teaching certificate must confer with the Head of the Education Department early in their program planning. Information should be obtained to insure that the student will have

necessary prerequisites for placement in student teaching in the public schools. In addition, no student will be assigned to student teaching unless formal application has been made to the Head of the Education Department at least six weeks prior to the end of the semester preceding the term in which student teaching is desired. Student teaching is not permitted without the permission of the Head of the Education Department.

PREREQUISITES FOR STUDENT TEACHING—Placement in the public schools is approved only after the student has met certain requirements and is, in the judgment of the Department Head, qualified to enter this program.

Only students who have completed prescribed courses, shown adequate scholarship, and demonstrated their reliability will be placed in the directed teaching program. Formal applications for student teaching must be made at least six weeks prior to the end of the semester preceding the term in which student teaching is desired.

REQUIREMENTS FOR ADMISSION TO STUDENT TEACHING

1. Elementary Schools—Kindergarten through Eighth Grade.
   (a) Completion of 96 collegiate credits leading to a Bachelor's degree with a minimum grade point average of 2.00
   (b) Completion of a minimum of ten hours in professional education courses, including methods of teaching reading, educational psychology and Tests and Measurements.
   (c) Recommendation of the Head of the Department of Education.
2. Secondary Schools—Seventh Grade through Twelfth Grade.
   (a) Completion of 96 collegiate credits leading to a Bachelor's degree with a minimum grade point average of 2.00
   (b) Completion of a minimum of twenty-four semester hours in an approved teaching major—i.e., a subject that is actually taught in the secondary schools of Alaska—with a minimum grade point average of 2.00.
   (c) Completion of a minimum of ten semester hours in professional education courses, including educational psychology and Tests and Measurements.
   (d) Recommendation of the Head of the Department of Education.

REQUIREMENTS FOR A M.Ed. DEGREE IN EDUCATION

1. A minimum of 30 credits of approved courses, including methods of educational research and an independent project or thesis.
2. One year of satisfactory teaching or administrative experience, or reasonable equivalency.
3. The equivalent of an undergraduate major in Education.
4. Completion of the general graduate degree requirements listed on page 55.

For course descriptions, see page 117.

HEALTH, PHYSICAL EDUCATION AND RECREATION DEPARTMENT

FRANCIS 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.

Students desiring to pursue the curriculum in physical education will register in both the Department of Education and the Department of Health, Physical Education and Recreation.

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

1. Complete general requirements for a B.Ed. degree as listed on page 54.
2. Complete 24 credits in Physical Education, including:

P.E. 111—Principles of Physical Education	3 credits
P.E. 330—Sports Officiating	3
P.E. 346—First Aid	2
P.E. 426—Organization and Administration of Physical Education	3

3. Complete 8 credits from theory and practice or coaching courses.

A minor in Physical Education requires 12 credits in Physical Education including:

P.E. 111—Principles of Physical Education	3 credits
P.E. 426—Organization and Administration of Physical Education	3

6 credits in theory and practice or coaching courses.

For course descriptions, see page 148.

HOME ECONOMICS DEPARTMENT

LUCILE TROST—DEPARTMENT HEAD

DEGREE—BACHELOR OF SCIENCE

MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS

This broad college course in Home Economics, with liberal electives, is designed primarily to train the student for marriage and family life. Home Economics trains the young woman to recognize good quality and beauty in her purchases, to safeguard health and vitality by proper diet and hygienic practices, to maintain happy personal relationships, to take a constructive interest in community life, and to fortify herself against the drudgery and monotony of housekeeping by learning good management and by developing interest in the varied activities peculiar to the profession of homemaking.

Home Economists are in great demand. By proper selection of courses, graduates are enabled to find employment in related vocations at salaries which compare favorably with those in other fields requiring special training. There is a steady demand for teachers of homemaking, extension workers, lunch room managers, social workers, designers, demonstrators, nutritionists, and dietitians, as well as home economists in TV, radio, and magazine writing.

The University of Alaska Home Economics laboratories are large, well-lighted, and equipped with modern conveniences. Students taking H.E. 241 live as a family in the Home Management house. The nursery school for three- and four-year-olds is used as a laboratory for child development classes.

HOME ECONOMICS CURRICULUM

FALL SEMESTER

FIRST YEAR	16 CREDITS
Engl. 101—Comp. & Modes of Lit.	3
H.E. 102—Meal Management	3
H.E. 131—College Orient.	2
H.E. 121—Related Art	2
P.E. 101—Phys. Education	1
Electives	5

SECOND YEAR	16 CREDITS
Psy. 101—Introduction to Psychology	3
H.E. 211—Textiles	3
English Elective	3
P.E. 201—Phys. Education	1
Biol. 105—Fund. of Biology	4
Art 201—Art Appreciation	2

THIRD YEAR	16 CREDITS
Chem. 101—Gen. Chemistry	4
Econ. 121—Prin. of Economics	3
H.E. 312—Adv. Clothing	3
Electives	6

FOURTH YEAR	17 CREDITS
H.E. 441—Family Health	2
H.E. 445—Home Management	3
Electives	12

SPRING SEMESTER

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

	16 CREDITS
H.E. 236—Marriage & Fam. Life	3
H.E. 201—Advanced Foods	3
English Elective	3
P.E. 202—Phys. Education	1
Speech 251—Public Speaking	3
Electives	3

	17 CREDITS
H.E. 304—Nutrition	3
H.E. 301—Child Development	3
Electives	11

	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 can 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 RICHARD A. BEYER—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. unless exempted by the Professor of Military Science.

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 into 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 $500.00 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 an Intercollegiate 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 142.

PSYCHOLOGY AND SOCIOLOGY DEPARTMENT

PHILIP ANAST—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 54.
2. Complete 24 credits in psychology beyond Psy. 101, 102, including:
   - Psy. 205—Statistics for the Behavioral Science ..... 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 remains 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 54.
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. 303—Culture and Personality 3
   - Soc. 420—Social Theory 3
   - Soc. 209—Urban Sociology 3
   - Soc. 236—The Family 3
   - Soc. 205—Group Processes 3
4. Complete the following:
   - Anth. 101—Introduction to the Study of Man 3

A minor in Sociology requires 12 elective credits in Sociology.

For course descriptions, see page 158.

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—Agricultural Science Department, Biological Sciences 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.

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 agricultural courses are based. The curriculum is intended for students who expect to prepare for farming, teaching, or business related to agriculture, or who expect to specialize in a graduate study program. Some upper division courses are offered as demand warrants.

The Agricultural Experiment Station provides an opportunity for summer employment where students can work under the supervision of skilled technicians.

AGRICULTURAL SCIENCE 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. 201—Gen. Geology	4
Soc. Sci. Elective	3
Engl. 213—Adv. Comp.	3
Elective	2
P.E. or Mil. Sci.	1 or 1½

SPRING SEMESTER	
	16 to 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
Biol. 234—Plant Morph. or	
Biol. 302—Genetics	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 54.
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—Sys. Botany
     - Biol. 332—Sys. Botany (2nd sem.) 3-4
4. 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 54.
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. 331-332—Systematic Botany 6
   - Biol. 416—Plant Physiol. 3

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 54.
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

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		SPRING SEMESTER	
FIRST YEAR	**16 or 16½ CREDITS**		**16 or 16½ CREDITS**
Engl. 101—Comp. & Modes of Lit.	3	Engl. 102—Comp. & Modes of Lit.	3
Biol. 105—Fund. of Biology	4	Biol. 106—Fund. of Biology	4
*Mathematics	4	*Mathematics	4
Chem. 101—General Chem.	4	Chem. 102—General Chem.	4
P.E. or Mil. Sci.	1 or 1½	P.E. or Mil. Sci.	1 or 1½
SECOND YEAR	**17 or 18½ CREDITS**		**17 or 18½ CREDITS**
Phys. 103—Coll. Physics	4	Phys. 104—Coll. Physics	4
Program I or II Requirement	4 or 5	Program I or II Requirement	4 or 5
†Foreign Language 101	5	Foreign Language 102	5
Soc. Sci. Elective	3	Soc. Sci. Elective	3
P.E. or Mil. Sci.	1 or 1½	P.E. or Mil. Sci.	1 or 1½

* Acceptable mathematics sequences include Math. 121-122; Math. 101-102; Math. 103-104 and Math. 107 or Math. 204; Math. 107-108-109.

† 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.

THIRD & FOURTH YEARS	**67 CREDITS**		
Foreign Language 201	3	Foreign Language 202	3
Geol. 201—General Geology	4	Engl. Elective	3
Engl. Elective	3	Biol. 492	1
Soc. Sci. Elective	3	Program I or Program II and Electives	40-42
Biol. 491	1		

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. 331-332—Systematic Botany
   - Geol. 413—Vertebrate Paleontology — 9

PROGRAM II REQUIREMENTS FOR A. B.S. DEGREE WITH OPTIONS 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 or Math. 121-122 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. 331-332—Systematic Botany	6
Chem. 223—Organic Chem. or Biol. 413—Cell. Physiol.	3-4

Requirements for an Option in Botany

Biol. 233—Morph. Non-vascular Plants	3 credits
Biol. 234—Morph. and Anat. Vasc. Plants	4
Biol. 302—Genetics	3
Biol. 303—Ecology	3
Biol. 331-332—Systematic Botany	6
Biol. 413—Cell. Physiol.	3
Biol. 416—Plant Physiology	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 St. Luke's Hospital School of Medical Technology (non-denominational) at Spokane, Washington, and if accepted, spends a 12-month internship at St. Luke's. Upon satisfactory completion of the course at St. Luke's, 30 semester hours of credit are granted by the University of Alaska which makes the student eligible to receive a Bachelor of Science degree. 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		SPRING SEMESTER	
FIRST YEAR	**15 or 15½ CREDITS**		**15 or 15½ CREDITS**
Engl. 101—Comp. & Modes of Lit.	3	Engl. 102—Comp. & Modes of Lit.	3
Math. 103—Surv. Coll. Math.	3	Math. 104—Surv. Coll. Math.	3
Chem. 101—General Chem.	4	Chem. 102—General Chem	4
Biol. 105—Fund. of Biology	4	Biol. 106—Fund. of Biology	4
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**
Biol. 317—Comp. & Dev. Anatomy	5	Biol. 318—Comp. & Dev. Anatomy	5
Engl. 213—Adv. Comp.	3	Chem. 212—Quant. Anal.	4
Soc. Sci. Electives	3	Biol. 214—Bacteriology	4
*Approved Chem. Elective	4	Soc. Sci. Elective	3
P.E. or Mil. Sci.	1 or 1½	P.E. or Mil. Sci.	1 or 1½
THIRD YEAR	**17½ CREDITS**		**16½ or 18½ CREDITS**
Phys. 103—Coll. Physics	4	Phys. 104—Coll. Physics	4
Biol. 307—Parasitology or Biol. 413—Cell. Physiology	3	Biol. 302—Genetics	3
Foreign Language 101	5	Biol. 414—Comp. Physiol.	4
Biol. 491—Seminar	½	Biol. 492—Seminar	½
Engl. Elective	3	Foreign Language 102	5
Soc. Sci. Elective	3	Elective	0-2

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

FOURTH YEAR **30 CREDITS**

Twelve-month internship in Medical Technology at St. Luke's Hospital School of Medical Technology.

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.

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 73 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 73.

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 55.

For course descriptions, see page 106.

WILDLIFE MANAGEMENT DEPARTMENT

FREDERICK C. DEAN—DEPARTMENT HEAD

DEGREES—BACHELOR OF SCIENCE AND MASTER OF SCIENCE

MINIMUM REQUIREMENTS FOR DEGREES: B.S.—135 CREDITS
M.S.—30 ADDITIONAL CREDITS

Both the wildlife and fisheries biology options in the undergraduate program in 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 options in Wildlife and Fisheries Biology.

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

REQUIREMENTS AND CURRICULA FOR A B.S. DEGREE IN WILDLIFE MANAGEMENT

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 and Anal.	4
P.E. or Mil. Sci.	1 or 1½

SECOND YEAR — 16 or 16½ CREDITS

W.M. 102—Cons. Natural Res.	2
Biol. 317—Comp. & Dev. Anatomy	5
Phys. 103—College Physics	4
Chem. 223—Intro. Organic Chem. (Fisheries Major)	
or	
Geol. 201—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 and Anal.	
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 — 18 CREDITS

Biol. 303—Ecology	3
Biol. 305—Invert. Zoology	4
Biol. 326—Ichthyology	3
Foreign Language 101	5
Soc. Sci. Elective	3

18 CREDITS

W.M. 304—Wildlife Mgt. Prin.	3
Biol. 414—Comp. Physiol.	4
Biol. 416—Plant Physiol.	3
Foreign Language 102	5
Elective	3

FOURTH YEAR — 16 CREDITS

W.M. 421—Hydrobiology	3
W.M. 491—Seminar	
or	
W.M. 493—Special Topics	1
Econ. 121—Prin. of Economics	3
Foreign Language 201	3
Soc. Sci. Elective	3
Elective	3

17 CREDITS

W.M. 410—Wildlife Techniques	3
W.M. 424—Ecology of Fishes	3
Biol. 208—Organic Evolution	2
Biol. 302—Genetics	3
Engl. 314—Research Writ.	3
Foreign Language 202	3

MAJOR IN WILDLIFE MANAGEMENT

THIRD YEAR — 17 CREDITS

Biol. 303—Ecology	3
Biol. 323—Mammalogy	3
Biol. 331—Systematic Botany	
or	
Ag. 331—Soils	3
Sp. 251—Public Speaking	2.
Foreign Language 101	5
Elective	1

17 CREDITS

W.M. 304—Wildlife Mgt. Prin.	3
Biol. 324—Ornithology	3
Biol. 332—Systematic Botany	
or	
C.E. 116—Mapping	3
Econ. 121—Prin. of Economics	3
Foreign Language 102	5

FOURTH YEAR — 18 CREDITS

W.M. 421—Hydrobiology	3
Biol. 326—Ichthyology	3
Biol. 331—Systematic Botany	
or	
Ag. 311—Soils	3
Elective	3
Soc. Sci. Electives	6

17 CREDITS

W.M. 410—Wildlife Techniques	3
W.M. 424—Ecology of Fishes	3
W.M. 492—Seminar	
or	
W.M. 494—Special Topics	1
Biol. 332—Systematic Botany	
or	
C.E. 116—Mapping	3
Biol. 414—Comp. Physiol.	4
Engl. 314—Research Writ.	3

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 or Wildlife Management.
2. An examination attesting a reading knowledge of French, German, or Russian (Fisheries).
3. Complete general requirements for a graduate degree as listed on page 55.

For course descriptions, see page 162.

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 to graduate study.

College of Business, Economics and Government

WILLIAM M. DICKSON—DEAN

The primary objective of the College of Business, Economics and Government 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 of Business, Economics and Government offers the following degrees: Bachelor of Business Administration, Associate in Business Administration, and Bachelor of Arts.

GRADUATE STUDY

See page 55.

ACCOUNTING DEPARTMENT

HORACE W. DOMIGAN—DEPARTMENT HEAD

DEGREE—BACHELOR OF BUSINESS ADMINISTRATION WITH A MAJOR IN ACCOUNTING

MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS

The Department of Accounting offers an extensive program for those interested in the field of general accounting, auditing and governmental accounting. The objective of the program is to train the individual so that he may assume accounting responsibilities in private, public, or governmental organizations.

GRADUATE STUDY

See page 55.

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

1. Complete requirements for a B.B.A. Degree listed on page 54.
2. Complete the following required courses:

Acc. 315—Intermediate Accounting	3 credits
Acc. 316—Advanced Accounting	3
Acc. 413—Auditing	3
Acc. 416—Cost Accounting	3
Approved Upper Division Electives	14-16

For course descriptions, see page 100.

BUSINESS ADMINISTRATION DEPARTMENT

WILLIAM M. DICKSON—ACTING DEPARTMENT HEAD

DEGREES—BACHELOR OF BUSINESS ADMINISTRATION WITH A MAJOR IN ADMINISTRATION
BACHELOR OF BUSINESS ADMINISTRATION WITH A MAJOR IN MARKETING
BACHELOR OF BUSINESS ADMINISTRATION WITH A MAJOR IN FINANCE

MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS

The Department of Business Administration 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 55.

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

1. Complete requirements for a B.B.A. Degree listed on page 54.
2. Complete the following required courses

B.A. 361—Industrial Relations	3 credits
B.A. 363—Production Management	3
B.A. 462—Administrative Policy	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 54.
2. Complete the following required courses:

B.A. 343—Introduction to Marketing	3 credits
B.A. 442—Marketing Systems Simulation	3
B.A. 443—Theories and Analysis of Market Change	3
Approved Upper Division Electives	17-19

For course descriptions, see page 108.

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

1. Complete requirements for a B.B.A. Degree listed on page 54.
2. Complete the following required courses:

B.A. 323—Corporate Organizations and Finance	3 credits
B.A. 422—Corporate Financial Problems	3
B.A. 426—Advanced Monetary Theory	3
B.A. 424—Financial Administration and Management	3
Approved Upper Division Electives	14-16

For course descriptions, see page 108.

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 economics 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 55.

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

1. Complete the general requirements for a B.A. Degree listed on page 54.
2. Complete the following foundation courses:

Econ. 121-122—Principles of Economics	6 credits
Hist. 231-232—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 all 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 from each of two of the following fields:

   Economic History and Development
   - Econ. 337—Economic Development: Principles, Problems, and Policies ...
   - Econ. 432—Economic History of the United States .....
   - Econ. 435—Economics of Resources .....

   6

   Monetary and Fiscal Economics
   - Econ. 350—Financial and Fiscal Theory and Policy .....
   - Econ. 351—Public Finance and Taxation .....
   - Econ. 359—Government and Private Enterprise .....

   6

   International Economics
   - Econ. 463—International Economics I .....
   - Econ. 464—International Economics II .....

   6

4. Approved Upper Division Economic Electives 9

A minor in Economics requires 15 credits of approved Economics electives.

For course descriptions, see page 116.

HISTORY AND POLITICAL SCIENCE DEPARTMENT

HERMAN E. SLOTNICK—DEPARTMENT HEAD

DEGREE—BACHELOR OF ARTS

MINIMUM REQUIREMENTS FOR DEGREE—130 CREDITS

The Department of History and Political Science 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, and to give the student a knowledge of the political process and the institutions of government.

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. The student of political science may be interested in teaching or advanced study in government, the law and the other social sciences, or in preparing himself for a career in the public service. A program in international relations is offered for those students interested in a career in foreign service.

GRADUATE STUDY

See page 55.

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

1. Complete general requirements for a B.A. Degree listed on page 54.
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. 231-232—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.

For course descriptions, see page 132.

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

1. Complete general requirements for a B.A. Degree listed on page 54.
2. Complete the following courses:
   - Econ. 121—Principles of Economics ..... 3 credits
   - Hist. 231-232—History of the U.S. 6
   - P.S. 101-102—American Government 6
   - P.S. 203—International Relations 3
   - Soc. 101—Introduction to Sociology 3

3. Complete 27-28 credits in Political Science, including:
   - P.S. 201—Comparative Government 3
   - P.S. 203—International Relations 3
   - P.S. 359—Government and Private Enterprise 3
   - P.S. 411-412—Political Theory 6
   - P.S. 475—Methods and Problems 3
4. A Political Science Major may elect to take an option in Internatioanl Relations.
5. The option in International Relations includes P.S. 101-102, American Government, 3 credits in International Relations and at least 40 additional credits in Political Science, History, and Economics. The following is required:
   - P.S. 201—Comparative Government 3
   - P.S. 353—International Law 3
   - P.S. 351—International Organization 3
   - P.S. 485—Seminar in Contemporary International Relations 3
   - Econ. 121-122—Principles of Economics 6
   - Econ. 337—Economic Development 3
   - Econ. 463—International Economics 3

   And at least six credits must be taken from among the following area studies:
   - Hist. 344—The Soviet Union 3
   - Hist. 363—The Far East in Modern Times 3
   - P.S. 347—Contemporary Southeast Asia 3
   - P.S. 365—Contemporary Latin America 3

   And six additional credits from the following:
   - Hist. 334—Diplomatic History of the U.S. 3
   - Hist. 315—Contemporary Europe 3
   - Hist. 450—Twentieth Century America 3

A minor in Political Science requires 12 credits of P.S. electives which must be approved by the department.

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—62 CREDITS

The Department offers two 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) An intensive two-year program in office administration leading to an Associate in Business Administration Degree.

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

1. Complete requirements for the B.A. Degree listed on page 54.
2. Complete the following required courses:
   - Acc. 215-216—Principles of Accounting ..... 6 credits
   - O.A. 101-102—Shorthand 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. 302—Secretarial Training 3
3. Social Science must include:
   - Econ. 121-122—Principles of Economics 6
   - B.A. 331—Business Law 3
   - Approved Upper Division Electives 8

4. The following courses are required for a minor in education:

Psy. 101—General Psychology	3
Psy. 302—Psychology of Adolescence	3
Ed. 313—Educational Psychology	3
Ed. 321—The Secondary School	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 credits
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. 251—Public Speaking	2
Soc. 101 or Psy. 101	3
M.S. or P.E.	6-4

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	62-64

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 of Earth Sciences and Mineral Industry 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 offers a Ph.D.

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 are the College Office and Petroleum Laboratory of the Alaskan Geology Branch of the U.S. Geological Survey and a field office of the U.S. Bureau of Mines. 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

TROY L. PÉWÉ—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 aims of the geology curricula are to give broad training with emphasis on fundamenatl science and to train students for responsible positions in the field of Earth Sciences in education, government, industry and research. Graduate training is important in all aspects of Earth Sciences, and the curricula leading to the M.S. and Ph.D. are designed to prepare the student for his future in the profession and society.

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

FALL SEMESTER		SPRING SEMESTER	
FIRST YEAR	**16 or 16½ CREDITS**		**16 or 16½ CREDITS**
Engl. 101—Comp. & Modes of Lit.	3	Engl. 102—Comp. & Modes of Lit.	3
Math. 101—Intro. to Analysis	4	Math. 102—Intro. to Analysis	4
Geol. 201—General Geology	4	Geol. 202—Historical Geology	4
Chem. 101—General Chemistry	4	Chem. 102—General Chemistry	4
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**
Geol. 213—Mineralogy	5	Geol. 214—Petrology	5
Math. 201—Calculus	4	Math. 202—Calculus	4
Phys. 103—College Physics	4	Phys. 104—College Physics	4
E.S. 101—Graphics	2	E.S. 102—Graphics	2
P.E. or Mil. Sci	1 or 1½	Min. 102A—Min. Systems Engr.	1
		P.E. or Mil. Sci	1 or 1½
THIRD YEAR	**17 CREDITS**		**16 CREDITS**
Geology Elective	4	Geology Elective	4
Geol. 321—Sedimentation	3	Geol. 304—Geomorphology	3
Geol. 401—Invertebrate Paleo.	4	Geol. 314—Structural Geol.	3
English Elective	3	English Elective	3
Social Science Elective	3	Social Science Elective	3

SUMMER

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

FOURTH YEAR	**15 CREDITS**		**15 CREDITS**
Foreign Language	5	Foreign Language	5
Geol. 400—Earth Sci. Journal Cl.	1	Geol. 400—Earth Sci. Journal Cl.	1
Approved Electives	6	Approved Electives	9
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 (500)—Earth Sciences Journal Club is required of all upper division geology and graduate students every semester.

For course descriptions, see page 128.

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

FALL SEMESTER		SPRING SEMESTER	
FIRST YEAR	**17 or 17½ CREDITS**		**17 or 17½ CREDITS**
Engl. 101—Comp. & Modes of Lit.	3	Engl. 102—Comp. & Modes of Lit.	3
Math. 101—Intro. to Analysis	4	Math. 102—Intro. to Analysis	4
Chem. 101—General Chemistry	4	Chem. 102—General Chemistry	4
E.S. 101—Graphics	2	E.S. 102—Graphics	2
E.S. 111—Engr. Science	3	E.S. 112—Engr. Science	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**
Math. 201—The Calculus	4	Math. 202—The Calculus	4
Geol. 201—General Geology	4	Geol. 202—Historical Geology	4
Phys. 211—Gen. Physics	4	Phys. 212—Gen. Physics	4
E.S. 207—Measurements	3	E.S. 208—Mechanics	4
P.E. or Mil. Sci	1 or 1½	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
Geol. 401—Invertebrate Paleo.	4		

SUMMER

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

Min. 300—Mine Rescue and First Aid, offered by the U.S. Bureau of Mines, must be completed by all Geological Engineering students (no credit).

FOURTH YEAR	18 CREDITS		14 CREDITS
Chem. 331—Physical Chem.	4	Engl. Elective (Lit. Rec.)	3
Min. Pr. 313—Mineral Prep.	3	Geol. 406—Ore Deposits	3
Geol. 415—Geol. and Engr. Prob. of Frozen Ground	3	Social Science Electives	6
Geol. 400—Journal Club	1	Electives	1
Geol. 321—Sedimentation	3	Geol. 400—Journal Club	1
E.S. 341—Fluid Mechanics	4		

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

For course descriptions, see page 128.

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

1. Complete the general requirements for a B.A. Degree listed on page 54.
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 55.

REQUIREMENTS FOR Ph.D.

1. Program arranged by conference.
2. Completion of the general requirements for a Ph.D. listed on page 56.

MINERAL ENGINEERING DEPARTMENT

DONALD J. COOK—DEPARTMENT HEAD

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

MINIMUM REQUIREMENTS FOR DEGREES: 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 curricula 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		SPRING SEMESTER	
FIRST YEAR	**17 or 17½ CREDITS**		**17 or 17½ CREDITS**
Engl. 101—Comp. & Modes of Lit.	3	Engl. 102—Comp. & Modes of Lit.	3
Math. 101—Intro. to Analysis	4	Math. 102—Intro. to Analysis	4
E.S. 101—Graphics	2	E.S. 102—Graphics	2
E.S. 111—Engineering Science	3	E.S. 112—Engineering Science	3
Geol. 201—General Geology	4	*Min. 102—Min. Engr. Systems	4
P.E. or Mil. Sci.	1 or 1½	P.E. or Mil. Sci.	1 or 1½
SECOND YEAR	**17 or 17½ CREDITS**		**17 or 17½ CREDITS**
Math. 201—The Calculus	4	Math. 202—The Calculus	4
Phys. 211—General Physics	4	Phys. 212—General Physics	4
Geol. 213—Mineralogy	4	E.S. 208—Mechanics	4
Chem. 201—Gen. & Quant. Chem.	4	Chem. 202—Gen. & Quant. Chem.	4
P.E. or Mil. Sci.	1 or 1½	P.E. or Mil. Sci.	1 or 1½
THIRD YEAR	**18 CREDITS**		**18 CREDITS**
Chem. 331—Phys. Chem.	4	Met. 304—Intro. to Met.	3
Engl. Elective (Lit. recomm.)	3	Min. 306—Rock Mechanics	3
E.S. 331—Mechanics of Materials	3	Econ. 121—Prin. of Economics	3
E.S. 341—Fluid Mechanics	4	Geol. 314—Structural Geol.	3
Min. 303—Min. Plant Engr.	4	Min. 301—Mine Surveying	3
		English Elective	3

* Course may be taken in increments, see course descriptions, page 143.

Min. 300—Mine Rescue and First Aid, offered by the U.S. Bureau of Mines, must be completed before graduation (no credit).

FOURTH YEAR	**18 CREDITS**		**16 CREDITS**
Min. 405—Geophys. & Geochem. Ex.	3	Min. 496—Min. or Mineral Res.	3
*B.A. 363—Prod. Mngt.	3	*Geol. 406—Ore Deposits	3
E.E. 313—Elem. Elec. Engr.	3	E.E. 314—Elem. Elec. Engr.	3
Math. Elective	3	Min. 407—Mineral Val. & Econ.	4
Min. Pr. 313—Intro. to Min. Prep.	3	Social Science Elective	3
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 143.

PETROLEUM ENGINEERING—Because of the possibility of a great petroleum industry in Alaska in the not too distant future, 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 four-year petroleum engineering programs in other states 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	SPRING SEMESTER	15 CREDITS
E.M. 511—Engr. Management	3	E.M. 512—Engr. Management	3
E.M. 605—Adv. Engr. Economy	3	E.M. 513—Engr. Management	3
Min. 697—Thesis	3	Min. 698—Thesis	3
Approved Elective	3	Approved Elective	6
Min. 621—Adv. Mineral Economics	3		

Completion of the general requirements for a graduate degree as listed on page 55.

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. 501—Froth Flotation	3	Min. Pr. 596—Min. Prep. Res.	3
Min. Pr. 595—Min. Prep. Res.	3	Min. Pr. 506—Plant Design	3
Min. 621—Adv. Mineral Economics	3	*Elective	6
*Elective	3	Min. Pr. 698—Thesis	3
Min. Pr. 697—Thesis	3		

Completion of the general requirements for a graduate degree as listed on page 55.

* Electives will be in the field of chemistry, physics and mathematics. They will include such subjects as: Chem. Engr. 587 or 588 (Advanced Unit Operations), Chemistry 635 (Chemical Spectroscopy), Physics 431 or 531 (Electricity and Magnetism) and Math. 409 or 509 (Experimental Design). These subjects will be chosen to broaden the candidate's fundamental knowledge, depending upon his specific background and interest.

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, Geophysics, Mathematics, Mechanical Engineering, and Physics.

The College also administers the curriculum in General Science and the Program in Electronic Technology.

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

WILLIAM S. WILSON—DEPARTMENT HEAD

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

MINIMUM REQUIREMENTS FOR DEGREES: 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 54.
2. Complete the following foundation courses:
   - Chem. 101 and 102—General Chemistry or Chem. 201 and 202—General and Quantitative Chemistry ..... 8 credits
   - Math. 101 and 102—Introduction to Analysis 8
   - 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	**16 or 16½ CREDITS**		**16 or 16½ CREDITS**
Chem. 101—General Chem. & Intro. Qualitative Analysis	4	Chem. 102—General Chem. & Intro. Qualitative Analysis	4
Math. 101—Intro. to Analysis	4	Math. 102—Intro. to Analysis	4
Biol. 105—Fund. of Biology	4	Biol. 106—Fund. of Biology	4
Engl. 101—Comp. & Modes of Lit.	3	Engl. 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—Gen. Physics or Phys. 103—College Physics	4	Phys. 212—Gen. Physics or Phys. 104—College Physics	4
Math. 201—Intermediate Calculus	4	Math. 202—Intermediate 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. 311—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 admission, 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 55.

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 111.

CHEMICAL ENGINEERING DEPARTMENT

WILLIAM S. WILSON—DEPARTMENT HEAD

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

MINIMUM REQUIREMENTS FOR DEGREES: 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 of 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		SPRING SEMESTER	
FIRST YEAR	**16½ CREDITS**		**16½ CREDITS**
Engl. 101—Comp. & Modes of Lit.	3	Engl. 102—Comp. & Modes of Lit.	3
Math. 101—Intro. to Analysis	4	Math. 102—Intro. to Analysis	4
E.S. 101—Graphics (Drawing)	2	E.S. 101—Graphics (Descrip.)	2
E.S. 111—Engr. Science	3	E.S. 112—Engr. Science	3
Econ. 121—Prin. of Econ.	3	Soc. Sci. or Humanities	3
M.S. 101—Mil. Sci.	1½	Mil. Sci.	1½
SECOND YEAR	**16½ CREDITS**		**17½ CREDITS**
Math. 201—Intermediate Calculus	4	Math. 202—Intermediate Calculus	4
Phys. 211—Gen. Physics	4	Phys. 212—Gen. Physics	4
E.S. 207—Measurements	3	E.S. 208—Mechanics	4
Chem. 201—Gen. Chem. & Quant. Chem.	4	Chem. 202—Gen. Chem. & Quant. Chem.	4
M.S. 201—Mil. Sci.	1½	M.S. 202—Mil. Sci.	1½
THIRD YEAR	**17 CREDITS**		**17 CREDITS**
E.S. 331—Mech. of Materials	3	C.E. 334—Phys. Prop. of Mat.	3
Math. 302—Differential Equations	3	Chem. 322—Organic Chem.	4
Chem. 321—Organic Chem.	4	Chem. 332—Physical Chemistry	4
Chem. 331—Physical Chemistry	4	E.E. 314—Elements of Elect. Engr.	3
E.E. 313—Elements of Elect. Engr.	3	Math. 310—Numerical Analysis	3
FOURTH YEAR	**14 CREDITS**		**15 CREDITS**
E.S. 341—Fluid Mechanics	4	E.S. 450—Engr. Mgt. & Oper.	3
C.E. 441—Sanitary Engr.	3	E.S. 491—Engr. Seminar	3
Ch.E. 477—Unit Operations	3	Ch.E. 486—Chem. Engr. Thermo.	3
Ch.E. 479—Unit Operations Lab.	1	Engl. 313—Advanced Exposition	3
Humanities or Social Science	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
Math. 505—Math. of Phys. & Engr.	3
Ch.E. 533—Applied Chem. Kinetics	3
Ch.E. 587—Adv. Unit Operations	3
Ch.E. 593—Special Topics	1
Engineering Elective	3
Approved Elec. in Chem., Phys., Engineering or Metallurgy	3

For course descriptions, see page 110.

	16 CREDITS
Math. 506—Math. of Phys. & Engr.	3
Ch.E. 588—Unit Operations	3
Ch.E. 590—Unit Operations Lab.	2
Ch.E. 594—Special Topics	2
Engineering Elective	3
Approved Elec. in Chem., Phys., Engineering or Metallurgy	3

CIVIL ENGINEERING DEPARTMENT

E. F. RICE—DEPARTMENT HEAD

DEGREES—BACHELOR OF SCIENCE (ENGINEERING SCIENCE), BACHELOR OF ENGINEERING (CIVIL), AND MASTER OF SCIENCE

MINIMUM REQUIREMENTS FOR DEGREES: B.S.—130 CREDITS
M.S.—30 ADDITIONAL CREDITS
B.E.—162 CREDITS

Engineering embraces the wide range of cultural and professional subjects having to do with the 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 of Civil Engineering will normally enter either the B.E. curriculum or the M.S. program in Civil Engineering in the fifth year.

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

FALL SEMESTER	
FIRST YEAR	**16½ CREDITS**
Engl. 101—Comp. & Modes of Lit.	3
Math. 101—Intro. to Analysis	4
E.S. 101—Graphics (Drawing)	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—Intermediate Calculus	4
Phys. 211—Gen. Phys.	4
E.S. 207—Measurements	3
Chem. 201—Gen. & 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
E.S. 341—Fluid Mechanics	4
E.E. 313—Elem. of Elect. Engr.	3
Geol. 201—General Geology	4
FOURTH YEAR	**16 CREDITS**
C.E. 435—Soil Mechanics	3
C.E. 441—Sanitary Engr.	3
C.E. 431—Structural Analysis	4
C.E. 415—Surveying	3
Sp. 251—Public Speaking	3

SPRING SEMESTER	
	16½ CREDITS
Engl. 102—Comp. & Modes of Lit.	3
Math. 102—Intro. to Analysis	4
E.S. 102—Graphics (Descrip.)	2
E.S. 112—Engr. Science	3
Soc. Sci. or Humanities	3
M.S. 102—Mil. Sci.	1½
	17½ CREDITS
Math. 202—Intermediate Calculus	4
Phys. 212—Gen. Phys.	4
E.S. 208—Mechanics	4
Chem. 202—Gen. & Quant. Chem.	4
M.S. 202—Mil. Sci.	1½
	17 CREDITS
C.E. 334—Phys. Prop. of Materials	3
E.S. 346—Basic Thermodynamics	3
E.E. 314—Elem. of Elect. Engr.	3
Engl. 313—Advanced Exposition	3
C.E. 344—Hydrology	2
Math. 312—Numerical Methods for Engineers	3
	14 CREDITS
E.S. 450—Engr. Mgt. & Oper.	3
C.E. 432—Structural Design	4
C.E. 402—Transportation Engr.	2
C.E. 422—Foundation Engr.	3
Soc. Sci. or Humanities	3

REQUIREMENTS FOR A B.E. DEGREE (CIVIL)

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

	16 CREDITS		16 CREDITS
M.E. 513—Heat Transfer	3	E.M. 604—Arctic Engr.	3
Specialty—Subjects in Adv. Engr.	13	Approved Specialty and Adv. Courses	13

REQUIREMENTS FOR A M.S. DEGREE IN CIVIL ENGINEERING

1. A minimum of 30 credits of approved courses, including C.E. 697, Thesis.
2. Completion of the general graduate degree requirements listed on page 55.

For course descriptions, see page 114.

ELECTRICAL ENGINEERING DEPARTMENT

JOHN G. TRYON—DEPARTMENT HEAD

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

MINIMUM REQUIREMENTS FOR DEGREES: B.S.—130 CREDITS
B.E.—162 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 B.E. is ready to work in industry or continue with graduate study. The student who completes the B.S. should continue with the B.E. or with graduate work.

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

FALL SEMESTER		SPRING SEMESTER	
FIRST YEAR	**16 or 16½ CREDITS**		**16 or 16½ CREDITS**
Engl. 101—Comp. & Modes of Lit.	3	Engl. 102—Comp. & Modes of Lit.	3
Math. 101—Intro. to Analysis	4	Math. 102—Intro. to Analysis	4
E.S. 101—Graphics	2	E.S. 102—Graphics	2
E.S. 111—Engineering Science	3	E.S. 112—Engineering Science	3
Econ. 121—Prin. of Econ.	3	Soc. Sci. or Humanities	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**
Math. 201—Intermediate Calculus	4	Math. 202—Intermediate Calculus	4
Phys. 211—Gen. Physics	4	Phys. 212—Gen. Physics	4
E.E. 203—Fund. of Elect. Engr.	4	E.E. 204—Fund. of Elect. Engr.	4
E.S. 207—Measurements	3	E.S. 208—Mechanics	4
P.E. or Mil. Sci.	1 or 1½	P.E. or Mil. Sci.	1 or 1½
THIRD YEAR	**17 CREDITS**		**16 CREDITS**
Math. 302—Diff. Equations	3	Math. 312—Numerical Methods for Engineers	3
Chem. 201—Gen. & Quant. Chem.	4	Chem. 202—Gen. & Quant. Chem.	4
E.S. 331—Mechanics of Materials	3	Engl. 313—Advanced Exposition	3
*E.E. 333—Electronics	4	*E.E. 334—Electronics	4
Soc. Sci. or Humanities	3	Elective	2

FOURTH YEAR	15 or 16 CREDITS		15 or 16 CREDITS
E.S. 341—Fluid Mechanics	4	E.S. 346—Basic Thermodynamics	3
*E.E. 403—Machines & Power	4	*E.E. 404—Machines & Power	4
E.E. 453—Circuit Theory or Phys. 331—Elect. & Magnetism	4	E.E. 454—Circuit Theory or E.E. 432—Fields, Lines, Antennas	4
Electives	3 or 4	E.S. 492—Engr. Seminar	3
		Electives	1 or 2

Electives must have the approval of the department.

* Interchange of certain third and fourth year courses that are not normally offered every year will be made by the department.

REQUIREMENTS FOR A B.E. DEGREE (ELECTRICAL)

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

	16 CREDITS		16 CREDITS
Phys. 331—Elect. & Magnetism or E.E. 453—Circuit Theory	4	E.E. 432—Fields, Lines, Antennas or E.E. 454—Circuit Theory	4
E.E. 471—Instr. & Control	4	E.E. 462—Communication Systems	4
Electives	8	E.S. 450—Engineering Management	3
		Electives	5

Electives must have the approval of the department.

For course descriptions, see page 122.

ENGINEERING MANAGEMENT

JOHN HILPERT—DEPARTMENT HEAD

Engineering Management consists of the legal, business, human relations, and technical subjects needed by graduate engineers whose positions will be executive or managerial in industry or engineering organizations employing several professional and subprofessional personnel.

The curriculum in Engineering Management consists of core courses in Engineering Management, additional work in one of the recognized fields of engineering, and projects of research in the application of engineering management principles.

FALL SEMESTER	15 CREDITS		15 CREDITS
B.A. 331—Business Law	3	B.A. 332—Business Law	3
E.M. 611—Engr. Mgt.	3	E.M. 612—Engr. Mgt.	3
E.M. 605—Adv. Engr. Economy	3	E.M. 613—Engr. Mgt.	3
Electives	6	Project or Research	4 or 5
		Electives	1 or 2

The Business Law requirements will be waived if a student shows evidence of satisfactory completion of subject matter at B grade level.

For course descriptions, see page 123.

GEOPHYSICS DEPARTMENT

The Geophysics Department has been combined with the Physics Department. See page 98.

GENERAL SCIENCE CURRICULUM

CHARLES SARGENT—ACTING 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		SPRING SEMESTER	
FIRST YEAR	**16 or 16½ CREDITS**		**16 or 16½ CREDITS**
Engl. 101—Comp & Modes of Lit.	3	Engl. 102—Comp. & Modes of Lit.	3
Biol. 105—Fund. of Biology	4	Biol. 106—Fund. of Biology	4
Math. 101—Intro. to Analysis	4	Math. 102—Intro. to Analysis	4
Chem. 101—General Chem. or Phys. 111—Coll. Physics	4	Chem. 102—General Chem. or Phys. 112—Coll. Physics	4
P.E. or Mil. Sci.	1 or 1½	P.E. or Mil. Sci.	1 or 1½
SECOND YEAR	**17 to 18½ CREDITS**		**17 to 18½ CREDITS**
Econ. 121—Prin. of Economics	3	Phys. 104—Coll. Physics or Chem. 102—Gen. Chem.	4
Phys. 104—Coll. Physics or Chem. 101—Gen. Chem.	4	Anth. 101—Intro. Study of Man	3
Geol. 201—Gen. Geology	4	For. Lang. or Dept. Elec.	7 or 6
For. Lang. or Dept. Elec.	6 or 5	Elective	3
P.E. or Mil. Sci.	1 or 1½	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	Dept. Elec. or For. Lang.	5
Engl. 313—Adv. Exposition or selected literature	3	Engl. 314—Scholarly and Tech. Writing or selected literature	3
Social Science Elective	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 a 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. 102, 201; 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 55.

The Departments 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. 308—Higher Geometry	3
Math. 314—Linear Algebra	3
Math. 371—Probability	3
Math. 401—Advanced Calculus	3
Math. 402—Advanced Calculus	3

The B.A. degree requires completion of the above major requirements as well as the general requirements for the B.A. degree as listed on page 54.

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 AND CURRICULUM FOR A B.S. WITH A MAJOR IN MATHEMATICS

FALL SEMESTER		SPRING SEMESTER	
FIRST YEAR	**16 or 16½ CREDITS**		**16 or 16½ CREDITS**
Engl. 101—Comp. & Modes of Lit.	3	Engl. 102—Comp. & Modes of Lit.	3
E.S. 111—Engr. Sci.	3	E.S. 112—Engr. Sci.	3
*Math. 101—Intro. to Analysis	4	*Math. 102—Intro. to Analysis	4
P.E. or Mil. Sci.	1 or 1½	P.E. or Mil. Sci.	1 or 1½
Foreign Language	5	Foreign Language	5
SECOND YEAR	**16 or 16½ CREDITS**		**16 or 16½ CREDITS**
Math. 201—Calculus	4	Math. 202—Calculus	4
Phys. 211—General Physics	4	Phys. 212—General Physics	4
Approved Electives	3	Approved Electives	3
Chem. 201—Gen. Chem. & Quant. Chem.	4	Chem. 202—Gen. Chem. & Quant. Chem.	4
P.E. or Mil. Sci.	1 or 1½	P.E. or Mil. Sci.	1 or 1½

THIRD YEAR	17 CREDITS		17 CREDITS
Math. 302—Differential Equations	3	Math. 308—Higher Geometry	3
Math. 303—Intro. to Modern Algebra	3	Math. 314—Linear Algebra	3
Math. 371—Probability	3	Econ. 121—Principles of Economics	3
English Elective	3	English Elective	3
Approved Electives	5	Approved Electives	5
FOURTH YEAR	**17 CREDITS**		**17 CREDITS**
Math. 401—Advanced Calculus	3	Math. 402—Advanced Calculus	3
Social Sci. Elective	3	Social Sci. Electives	3
Approved Electives	11	Approved Electives	11

* Math. 101-102 may be replaced by Math. 200 if the student has adequate preparation.

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 55.

For course description, see page 138.

MECHANICAL ENGINEERING DEPARTMENT

E. F. RICE—DEPARTMENT HEAD

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

MINIMUM REQUIREMENTS FOR DEGREES: B.S.—130 CREDITS
B.E.—162 CREDITS

Mechanical Engineering embraces professional work having reference to the design and the supervision of the manufacture of machines and devices of industry. At the University of Alaska, emphasis will be placed upon those phases of mechanical engineering which deal with heating, ventilating and the extractive industries, as it is in those fields that Alaska most needs members of the Mechanical Engineering profession.

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

FALL SEMESTER		SPRING SEMESTER	
FIRST YEAR	**16½ CREDITS**		**16½ CREDITS**
Engl. 101—Comp. & Modes of Lit.	3	Engl. 102—Comp. & Modes of Lit.	3
Math. 101—Intro. to Analysis	4	Math. 102—Intro. to Analysis	4
E.S. 101—Graphics (Drawing)	2	E.S. 102—Graphics (Descrip.)	2
E.S. 111—Engr. Science	3	E.S. 112—Engr. Science	3
Econ. 121—Prin. of Econ.	3	Social Science or Humanities	3
M.S. 101—Mil. Sci.	1½	M.S. 102—Mil. Sci.	1½
SECOND YEAR	**16½ CREDITS**		**17½ CREDITS**
Math. 201—Intermediate Calculus	4	Math. 202—Intermediate Calculus	4
Phys. 211—Gen. Physics	4	Phys. 212—Gen. Physics	4
E.S. 207—Measurements	3	E.S. 208—Mechanics	4
Chem. 201—Gen. & Quant. Chem.	4	Chem. 202—Gen. & Quant. Chem.	4
M.S. 201—Mil. Sci.	1½	M.S. 202—Mil. Sci.	1½
THIRD YEAR	**16 CREDITS**		**16 CREDITS**
E.E. 313—Elem. of Elect. Engr.	3	E.E. 314—Elem. of Elect. Engr.	3
Math. 302—Differential Equations	3	Math. 312—Num. Meth. for Engr.	3
E.S. 331—Mech. of Materials	3	E.S. 346—Basic Thermodynamics	3
E.S. 341—Fluid Mechanics	4	Engl. 313—Advanced Exposition	3
M.E. 301—Kinematics of Machines	3	M.E. 302—Dynamics of Machines	4

FOURTH YEAR	16 CREDITS		17 CREDITS
M.E. 401—Machine Design	4	M.E. 418—Power Analysis	4
M.E. 411—Space Conditioning	3	M.E. 420—Industrial Processes	3
M.E. 413—M.E. Thermodynamics	3	M.E. 430—Instruments & Controls	3
Social Science or Humanities	3	E.S. 450—Engr. Mgt. & Oper.	3
Met. 301—Intro. to Metallurgy	3	M.E. 440—M.E. Lab.	1
		E.S. 492—Engr. Seminar	3

PHYSICS DEPARTMENT

LEIF OWREN—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 54.
2. Complete the following foundation courses:
   Phys. 103-104—College Physics ..... 8 credits
3. Complete a minor in Mathematics, which includes Math. 101, 102, 303 or Math. 103, 104, 204 and 303.
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		SPRING SEMESTER	
FIRST YEAR	**15 or 15½ CREDITS**		**15 or 15½ CREDITS**
Engl. 101—Comp. & Modes of Lit.	3	Engl. 102—Comp. & Modes of Lit.	3
Phys. 111—General Physics	3	Phys. 112—General Physics	3
Math. 101—Intro. to Analysis	4	Math. 102—Intro. to Analysis	4
P.E. or Mil. Sci.	1 or 1½	P.E. or Mil. Sci.	1 or 1½
*Approved Electives	4	*Approved Electives	4

SECOND YEAR	16 or 16½ CREDITS		16 or 16½ CREDITS
Math. 201—Intermediate Calculus	4	Math. 202—Intermediate Calculus	4
Phys. 211—General Physics	4	Phys. 212—General Physics	4
Foreign Language	3 or 5	Foreign Language	3 or 5
P.E. or Mil. Sci.	1 or 1½	P.E. or Mil. Sci.	1 or 1½
*Approved Electives	4 or 2	*Approved Electives	4 or 2
THIRD YEAR	**17 CREDITS**		**17 CREDITS**
Math. 302—Differential Equations	3	Math. 314—Linear Algebra	3
Phys. 311—Classical Physics	4	Phys. 312—Classical Physics	4
Phys. 331—Electricity & Magnetism	3	Phys. 332—Electricity & Magnetism	3
Phys. 381—Physics Laboratory	2	Phys. 382—Physics Laboratory	2
*Approved Electives	5	*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 Phys. or Phys. 494—Special Topics	3
		*Approved Electives	5

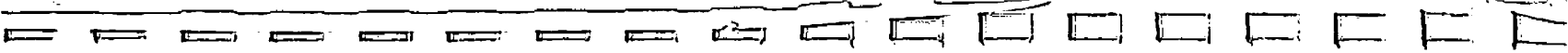
* 9 Credits of electives must be Social Science and 6 must be English.

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 55.

REQUIREMENTS FOR A Ph.D. DEGREE IN PHYSICS OR GEOPHYSICS

1. Completion of the requirements for the doctoral degree set forth on page 56.



Eskimo student applies skill of ivory carving to making wood block prints.

Course Descriptions

Courses offered by the University are listed alphabetically by department.

COURSES NUMBERS—The first number of a course 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.

300-499—These are 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.

500-599—These numbers indicate graduate courses designed for breadth rather than depth of training. They do not necessarily require an undergraduate major in the field as prerequisite. These numbers may also be used to record credit for graduate students in approved 300-400 courses.

600-699—These are graduate courses to which a few undergraduates may be admitted with the permission of the head of the department in whose department the course is offered.

700-799—These are graduate courses to which undergraduates will not be admitted.

491-492; 591-592; 691-692—These numbers have been reserved as Seminars for all departments.

493-494; 593-594; 693-694—These numbers have been reserved for Special Topics for all departments. As the courses may offer new material each time they are given, they may appear several times on a student's program. Individual titles of these courses appear on student transcripts.

COURSE CREDITS—One credit (or one hour) represents satisfactory completion of one hour of work a week for one semester of 18 weeks. 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 parentheses 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	Social Sciences	Humanities
Anthropology 302	Anthropology	Art
Biological Sciences	Economics	English
Chemistry	Geography	Foreign Language and Literature
Geography 201, 401	History	Journalism
Geology	Home Economics 236, 301	Linguistics
Mathematics	Law	Music
Physics	Political Science	Philosophy
	Psychology	Speech and Drama
	Sociology	

ACCOUNTING

Acc. 215 Principles of Accounting (0+6) — 3 Credits — Fall
216 — 3 Credits — Spring

Principles and techniques of accounting; Accounting as a factor in business management and control.

Fall semester: Basic accounting principles as they apply to business transactions.

Spring semester: Application of accounting principles and practices to business situations; preparation of financial statements.

Prerequisite: Sophomore standing or permission of the instructor for Acc. 215. Accounting 215 or equivalent for Acc. 216.

Acc. 315 Intermediate Accounting (0+6) 3 Credits **Fall**

Advanced principles and techniques of accounting; analysis and interpretation of financial statements with emphasis on the relation of accounting to business management and control. *Prerequisite: 216 or equivalent.*

Acc. 316 Advanced Accounting (0+6) 3 Credits **Spring**

A continuation of the work covered in Acc. 315 plus application of advanced principles and techniques of accounting to business situations. *Prerequisite: Acc. 315.*

Acc. 413 Auditing (3+0) 3 Credits **Fall**

Principles, standards and working procedures of audit verifications and analysis. *Prerequisite: Acc. 315.*

Acc. 415 Federal and State Tax Accounting (0+6) 3 Credits **Fall**

Basic rules and accounting procedures involving the Federal income tax as they affect individuals, partnerships, and corporations; income taxes and other levies imposed by the State of Alaska. *Prerequisite: Acc. 315.*

Acc. 416 Cost Accounting (3+0) 3 Credits **Spring**

Principles and procedures applicable to the determination of manufacturing costs; factors in reducing costs; interpretation of cost data. *Prerequisite: Acc. 315.*

Acc. 493 Special Topics Arr. **Fall**
494 Arr. **Spring**

An area of accounting in which the student has a special interest. Independent research, outside reading, and periodic reports are included. Regular assemblies and class meetings may be held where several students have the same interest and elect to study the same topic. *Admission by arrangement.*

Acc. 521 Advanced Accounting Problems (3+0) 3 Credits **Fall**
522 3 Credits **Spring**

Review of accounting theory and trends. Analytical study of material covered in recent C.P.A. examinations and of professional writings on accounting subjects. Working of problems under examination conditions and discussion of the points involved. *Prerequisite: 15 hours of accounting inncluding Acc. 316 and 413.*

Acc. 527 Professional Accounting (3+0) 3 Credits **Fall**

Professional aspects of accounting and their application, including budgeting, controllership and public accounting. *Prerequisite: 15 hours of Accounting including Acc. 316 and 413.*

Acc. 528 Governmental Accounting (3+0) 3 Credits **Spring**

Accounting and accounting systems employed by states, municipalities, other governmental units, and non-profit institutions. *Prerequisite: Acc. 315 and permission of instructor.*

Acc. 593 Special Topics Arr. **Fall**
594 Arr. **Spring**

Various subjects studied. *Admission by arrangement.*

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 and 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. 311 Soils (2+3) 3 Credits Fall

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 1964-65.*

Ag. 382 Horticulture (2+3) 3 Credits Spring

Survey of the field. Principles of propagation, culture and use; soil, light and water requirements; planting and harvesting; insect, weed and disease control. *Prerequisite: Biol. 105. Offered as demand warrants.*

Ag. 404 Agricultural Marketing (3+0) 3 Credits Spring

Principles and practices of agricultural marketing; market prices and costs; case studies. *Prerequisite: Econ. 121. Offered as demand warrants.*

Ag. 491 Seminar (Arrange) Credits Arr. Fall
492 Credits Arr. Spring

Acquaints advanced students with the unique problems encountered in the 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 Introduction to the Study of Man (3+0) 3 Credits Fall or Spring

Introduction to anthropological and geographical studies, including a survey of the origin and development of culture, a study of human behavior, and the mechanics of cultural and social change. Introduction to further study in the sciences.

Anth. 202 Introduction to Cultural Anthropology (3+0) 3 Credits Fall or Spring

Ways of living among different peoples of the world including the basic theories and concepts of current cultural anthropology. *Prerequisite: Anth. 101.*

Anth. 212 Human Origins (3+0) 3 Credits Spring

Survey of Old World prehistory from the Lower Palaeolithic to historical times.

Anth. 302 Physical Anthropology (3+6) 5 Credits Spring

Basic physical and constitutional anthropology, designed especially for students preparing for medical school or professional work in anthropology. *Prerequisite: Anth. 101, 212 or Biol. 103, 112.*

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

Survey of 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

Survey of 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

A continuation of Anthropology 312. Development of civilizations in the Valley of Mexico and in the Mayan and Andean areas. *Prerequisite: Anth. 312 or by permission.*

Anth. 326 Peoples of the Arctic (3+0) 3 Credits Fall

Survey of 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

Comparative study of 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

Survey of racial distribution, material and social cultures of the Indians of North America. *Recommended prerequisite: Anth. 101.*

Anth. 336 Ethnology of Central and South America (3+0) 3 Credits Spring

Survey of racial distribution, material and social cultures of the peoples of Central and South America. *Prerequisite: Anth. 101.*

Anth. 342 Alaska Natives (3+0) 3 Credits Spring

The 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

A survey of the material culture of primitive man with especial emphasis upon those aspects of economic importance. (The laboratory will allow students 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 which represent early culture in Arctic America. *Prerequisite: Anth. 312.*

Anth. 412 Arctic Archaeology (2+3) 3 Credits Spring

A continuation of Anthropology 411, including a practical study of methods of field and laboratory research with emphasis upon Eskimo prehistory. *Prerequisites: 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 by permission.*

Anth. 430 Anthropological Field Methods (1+3) 2 Credits Spring

A laboratory and demonstration course intended to prepare the student for field work and apprise him of recently developed techniques of collecting field data. Areas of concentration may be one of the following: Archaeology, ethnography, physical anthropolgy. *Prerequisites: Junior standing and by 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 by permission.*

Anth. 493 Special Topics Credits Arr. Fall
494 Credits Arr. Spring

Various subjects studied in special fields in anthropology. *Prerequisite: Senior standing or by 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, upon approval of the Head of the Department.

Anth. 511 Arctic Archaeology (2+3) — 3 Credits — Fall

Meet all the requirements of Anth. 411, plus additional work as required by instructor.

Anth. 512 Arctic Archaeology (2+3) — 3 Credits — Spring

Meet all the requirements of Anth. 412, plus additional work as required by instructor.

Anth. 525 Peoples of the Arctic (3+0) — 3 Credits — Fall

Meet all the requirements of Anth. 325, plus additional work as required by instructor.

Anth. 542 Alaska Natives (3+0) — 3 Credits — Spring

Meet all the requirements of Anth. 342, plus additional work as required by instructor.

Anth. 591 Seminar in American Archaeology (2+0) — 2 Credits — Fall or Spring

Meet all the requirements of Anth. 491, plus additional work as required by instructor.

Anth. 592 Seminar in American Ethnology (2+0) — 2 Credits — Fall or Spring

Meet all the requirements of Anth. 492, plus additional work as required by instructor.

Anth. 593 Special Topics — Credits Arr. — Fall
594 — Credits Arr. — Spring

Various subjects studied. *Admission by arrangement.*

Anth. 691 Seminar — Credits Arr. — Fall
692 — Credits Arr. — Spring

Topics studied including physical and social anthropology, comparative archaeology, and 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 First Year Freehand Drawing (0+4) — 2 Credits — Fall
106 — 2 Credits — Spring

Pictorial design, life drawing, landscape drawing, using varied techniques and media.

Art 161 Basic 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 Second Year Life Drawing and Composition (+0) — 2 Credits — Fall
206 — 2 Credits — Spring

Problems in drawing from life, exploring the possibilities in pictorial design and composition, still life, anatomy and perspective. *Prerequisite: Art 106 or by permission.*

Art 207 First Year Printmaking (0+4) — 2 Credits — Fall
208 — 2 Credits — Spring

Introduction to the various intaglio and relief printing media, engraving, etching, woodcut and other graphic media. *Prerequisites: Art 106 or by permission.*

Art 209 First Year Metalcraft (0+4) — 2 Credits — Fall
210 — 2 Credits — Spring

Material processes and techniques for silver jewelry and silversmithing. *Prerequisite: Art 161 or by permission.*

Art 211	**First Year Sculpture (0+6)**	**3 Credits**	**Fall**
212		**3 Credits**	**Spring**

Original, creative studies in clay, wood and stone sculpture. Emphasis on the mastery of techniques and material processes.

Art 213	**First Year Oil Painting (0+6)**	**3 Credits**	**Fall**
214		**3 Credits**	**Spring**

Basic investigation of materials of the painter and their use in expressing the students' ideas. *Prerequisite: Art 106 and 162 or by permission.*

Art 261	**History of World Art (3+0)**	**3 Credits**	**Fall**
262		**3 Credits**	**Spring**

Origins of art and its progressive development from the beginning to contemporary art; emphasis on change and progress. *Prerequisite: Sophomore standing. A term paper is required at the end of each semester.*

Art 305	**Advanced Life Drawing and Anatomy (0+4)**	**2 Credits**	**Fall**
306		**2 Credits**	**Spring**

A creative approach, including a comprehensive study of functional human anatomy, with the human figure as an art motif. *Prerequisite: Art 206 or by permission.*

Art 307	**Second Year Printmaking (0+4)**	**2 Credits**	**Fall**
308		**2 Credits**	**Spring**

Additional study and experimentation in intaglio, relief and planographic print techniques, including lithography, serigraphy and color printing. *Prerequisite: Art 208 or by permission.*

Art 309	**Second Year Metalcraft (0+4)**	**2 Credits**	**Fall**
310		**2 Credits**	**Spring**

Material processes and techniques for silver jewelry and silversmithing; creating problems in artistic design. *Prerequisite: Art 210 or by permission.*

Art 311	**Second Year Sculpture (0+6)**	**3 Credits**	**Fall**
312		**3 Credits**	**Spring**

Creative studies in welding, plaster casting, concrete casting, sand-casting, clay modeling, wood carving and stone carving. *Prerequisite: Art 212 or by permission.*

Art 313	**Second Year Oil Painting (0+4)**	**2 Credits**	**Fall**
314		**2 Credits**	**Spring**

Creating pictorial problems in oil painting techniques, still life, composition, and figure painting. *Prerequisite: Art 214 or by permission.*

Art 407	**Advanced Printmaking (0+4)**	**2 Credits**	**Fall**
408		**2 Credits**	**Spring**

Advanced study in all printing media. *Prerequisite: Art 308 or by permission.*

Art 409	**Advanced Metalcraft (0+4)**	**2 Credits**	**Fall**
410		**2 Credits**	**Spring**

Continued investigation and experimentation of Second Year Metalcraft. *Prerequisite: Art 310 or by permission.*

Art 411	**Advanced Sculpture (0+6)**	**3 Credits**	**Fall**
412		**3 Credits**	**Spring**

Styro-foam burn-out, aluminum casting, bronze casting, steel welding, repoussee sculpture, plastics, inlay, and architectural sculpture. *Prerequisite: Art 312 or by permission.*

Art 413	**Advanced Oil Painting (0+4)**	**2 Credits**	**Fall**
414		**2 Credits**	**Spring**

Exploration and development of the creative approach to the various techniques involved in figure, landscape, abstract, and non-objective painting and pictorial design. *Prerequisite: Art 314 or by permission.*

Art 493	**Special Topics**	**Credits Arr.**	**Fall**
494		**Credits Arr.**	**Spring**

Various subjects in art. ***Admission by arrangement.***

BIOLOGICAL SCIENCES

Biol. 105 Fundamentals of Biology (3+3) 4 Credits Fall
106 4 Credits Spring

Basic principles of living systems as illustrated in unicellular and multicellular organisms; the mechanisms of growth, development, heredity, and evolution; introduction to plant and animal kingdoms.
Fall semester: Origin of life, structures and functions of cells, cumulative development of structures and functions in the plant kingdom.
Spring semester: Genetics, ecology, cumulative development of structures and functions in the animal kingdom. An introductory course open to students in all curricula.

Biol. 208 Organic Evolution (2+0) 2 Credits Spring

Evidences, mechanisms, and directive forces in organic evolution. *Prerequisite: Biol. 105, 106. Offered alternate years; next offered 1964-5.*

Biol. 214 Bacteriology (2+6) 4 Credits Spring

General bacteriology. 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. *Prerequisites: Chem. 102, a laboratory course in elementary biology, or by permission. Offered alternate years; next offered 1954-5.*

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. Offered alternate years; next offered 1964-5.*

Biol. 234 Morphology and Anatomy of Vascular Plants (3+3) 4 Credits Spring

Comparative study of the morphology and developmental anatomy of the major groups of vascular plants with emphasis on life history and organization of fundamental tissue system. *Prerequisite: Biol. 105. Offered alternate years; next offered 1964-5.*

Biol. 302 Genetics (3+0) 3 Credits Spring

Principles of inheritance in plants and animals; the physico-chemical properties of genetic systems. *Prerequisites: 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 the reaction of organisms. Several field trips will be taken. *Prerequisites: Biol. 105, 106, or by permission.*

Biol. 305 Invertebrate Zoology (3+3) 4 Credits Fall

Structure, function, classification, evolution, and life histories of invertebrate animals. *Prerequisites: Biol. 105, 106.*

Biol. 307 Parasitology (2+3) 3 Credits Fall

Classification, morphology, life history, and ecology of parasites of animals. *Prerequisites: Biol. 105, 106. Offered alternate years; next offered 1965-6.*

Biol. 317 Comparative and Developmental 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. Laboratories include 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. *Prerequisites: Biol. 105, 106 and Junior standing or a B grade in Biol. 105, 106.*

Biol. 323 Mammalogy (2+3) 3 Credits Fall

Structure, characteristics, classification, evolution, life history, distribution, and economic importance of mammals. Identification of Alaskan mammals is stressed. *Prerequisites: Biol. 105, 106, and a course in anatomy or by permission.*

Biol. 324 Ornithology (2+3) 3 Credits Spring

Structure and adaptation, habits, life history, distribution, and classification of birds. Identification of Alaskan birds is stressed. *Prerequisites: Biol. 105, 106, and a course in anatomy or by permission.*

Biol. 326 Ichthyology (2+3) — 3 Credits — Fall

Classification, evolution, anatomy, and special modifications of fishes. *Prerequisites: Biol. 105, 106, and a course in anatomy or by permission.*

Biol. 331 Systematic Botany (2+3) — 3 Credits — Fall
332 — 3 Credits — Spring

Identification, nomenclature, and classification of vascular plants with emphasis on taxonomic principles and methods, mechanisms of variation, and the characteristics of major plant families. *Prerequisite: Biol. 105.*

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, photosyntheses, respiration, enzymes, metabolism. *Prerequisites: Chem. 101-102 and Biol. 105, 106; Chem. 221 or Chem. 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. *Prerequisites: Chem. 101-102 and Biol. 105, 106; Biol. 413 recommended.*

Biol. 416 Plant Physiology (2+3) — 3 Credits — Spring

Metabolic processes in higher plants. *Prerequisites: Chem. 101, 102; Biol. 105; Biol. 413 recommended. Offered alternate years; next offered 1964-5.*

Biol. 491 Seminar (Arrange) — Credits Arr. — Fall
492 — Credits Arr. — Spring

Topics in Biological Sciences. Required of Juniors and Seniors majoring in the Department of Biological Sciences.

Biol. 493 Special Topics (Arrange) — Credits Arr. — Fall
494 — Credits Arr. — Spring

Special fields in Biological Sciences. *Prerequisites: Senior standing or by permission. Offered as demand warrants.*

Biol. 502 Genetics (3+0) — 3 Credits — Spring

Meet all the requirements of Biol. 302, plus additional work as required by the instructor.

Biol. 503 Principles of Ecology (3+0) — 3 Credits — Fall

Meet all the requirements of Biol. 303, plus additional work as required by the instructor.

Biol. 505 Invertebrate Zoology (3+3) — 4 Credits — Fall

Meet all the requirements of Biol. 305, plus additional work as required by the instructor.

Biol. 507 Parasitology (2+3) — 3 Credits — Fall

Meet all the requirements of Biol. 307, plus additional work as required by the instructor. *Offered alternate years; next offered 1965-6.*

Biol. 513 Cell Physiology (2+3) — 3 Credits — Fall

Meet all the requirements of Biol. 413, plus additional work as required by the instructor.

Biol. 514 Comparative Physiology (3+3) — 4 Credits — Spring

Meet all the requirements of Biol. 414, plus additional work as required by the instructor.

Biol. 516 Plant Physiology (2+3) — 3 Credits — Spring

Meet all the requirements of Biol. 416, plus additional work as required by the instructor. *Offered in alternate years; next offered 1964-5.*

Biol. 523 Mammalogy (2+3) — 3 Credits — Fall

Meet all the requirements of Biol. 323, plus additional work as required by the instructor.

Biol. 524 Ornithology (2+3) 3 Credits Spring

Meet all the requirements of Biol. 324, plus additional work as required by the instructor.

Biol. 526 Ichthyology (2+3) 3 Credits Fall

Meet all the requirements of Biol. 326, plus additional work as required by the instructor.

Biol. 531 Systematic Biology (2+3) 3 Credits Fall
532 3 Credits Spring

Meet all the requirements of Biol. 331, 332, plus additional work as required by the instructor.

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 1964-5.*

Biol. 627 Physiology 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 1964-5.*

Biol. 637 Modern Theories of Evolution (2+0) 2 Credits Fall

Theories of organic evolution from Darwin's time to the present. *Offered as demand warrants.*

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 studied, 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+0) 3 Credits Fall

Principles involved in organizing and capitalizing a modern American business. Legal formation of the corporation; 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 the 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 Introduction to Marketing (3+0) 3 Credits Fall

Fundamental problems of marketing; use of simulation exercises; interrelations of marketing with other business activities; use of conceptual and quantitative sciences in Marketing.

Prerequisite: Econ. 121-122.

B.A. 350 Financial and Fiscal theory and policy (3+0) 3 Credits Fall or Spring

Sources and uses of money and credit in modern day society; regulation of money and credit, and their impact on the economic welfare of the United States.

B.A. 359 Government and Private Enterprise (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 and 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 by 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 Financial Administration and Management (3+0) 3 Credits Spring

New tools being developed in the area of financial management and control including: profit and loss budgeting, profit behavior analysis, uses and sources of funds analysis, capital expenditure planning, asset administration, and control of research expenditures.

B.A. 426 Advanced Monetary Theory (3+0) 3 Credits Spring

Nature and functions of the money market and its various institutions; interrelationships between U.S. monetary and fiscal policies and their impact on the American economy.

B.A. 442 Marketing Systems Simulation (3+0) Credits Spring

Introduction to the construction and use of mathematical models in marketing; application of digital computers in marketing systems analysis and control. *Prerequisites: Math 121, 122, 204, B.A. 343.*

B.A. 443 Theories and Analysis of Market Change (3+0) Credits Fall or Spring

Economic, sociological, psychological and anthropological factors influencing the market behavior of consumer and business units; long-run and short-run behavior change. *Prerequisites: B.A. 343, 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

Survey of the literature of organizational theory; emphasis on theoretical concepts, social science research techniques and organizational behavior. *Prerequisite: Upper Division standing, completion of behavioral science requirements, or permission of the Instructor.*

B.A. 493 Special Topics Arr. **Fall**
494 Arr. **Spring**

B.A. 522 Corporate Financial Problems (3+0) 3 Credits Spring

Meet all requirements of B.A. 422 and complete additional work as required by the instructor.

B.A. 523 Investment Management (3+0) 3 Credits Fall or Spring

Meet all requirements of B.A. 423 and complete additional work as required by the instructor.

B.A. 524 Financial Administration and Management (0+3) 3 Credits Spring

Meet all requirements of B.A. 424 and complete additional work as required by the instructor.

B.A. 525 Advanced Monetary Theory (3+0) 3 Credits Spring

Meet all requirements of B.A. 426 and complete additional work as required by the instructor

B.A. 542 Marketing Systems Simulation (3+0) 3 Credits Spring

Meet all requirements of B.A. 442 and complete additional work as required by the instructor.

B.A. 543 Theories and Analysis of Market Change (3+0) 3 Credits Fall or Spring

Meet all requirements of B.A. 443 and complete additional work as required by the instructor.

B.A. 561 Industrial Relations (3+0) 3 Credits Fall

Meet all requirements of B.A. 361 and complete additional work as required by the instructor.

B.A. 563 Production Management (3+0) 3 Credits Fall

Meet all requirements of B.A. 363 and complete additional work as required by the instructor.

B.A. 593 Special Topics Arr. Fall
594 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. *Prerequisite: B.A. 542 or consent of the instructor.*

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 upon current behavioral science research. *Prerequisite: B.A. 543 or consent of the instructor.*

B.A. 697 Thesis Credits Arr. Fall
698 Credits Arr. Spring

CHEMICAL ENGINEERING

Ch.E. 477 Unit Operations (3+0) 3 Credits Fall

Fundamental unit operations in chemical engineering; basic 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. *Prerequisites: Chem. 202, Math. 202, Phys. 212, and E.S. 346 or Chem. 331.*

Ch.E. 479 Unit Operation Laboratory (0+3) 1 Credit Fall

Experiments on unit operations. Concurrent: Ch.E. 477.

Ch.E. 486 Chemical Engr. Thermodynamics (3+0) 3 Credits Spring

Application of thermodynamics and the principles of physical chemistry to physical and chemical equilibria encountered in Chemical Engineering processes. *Prerequisites: Chem. 332, Math. 320, E.S. 346 or Chem. 331, and Ch.E. 477 recommended.*

Ch.E. 491 Seminar (1+0) 1 Credit Spring

Current Topics in Chemical Engineering.

Ch.E. 533 Applied Chemical Kinetics (3+0) 3 Credits Fall

Kinetics of various reactions. Prediction of course of reactions. *Prerequisites: Chem. 332 or 532, Ch.E. 477, 479 and 486.*

Ch.E. 587 Advanced Unit Operations (3+0) 3 Credits Fall
588 3 Credits Spring

Advanced treatment of flow of fluids, flow of heat, crystallization, diffusion, distillation, adsorption, fuels and combustion. *Prerequisite: Ch.E 477.*

Ch.E. 590 Unit Operations Laboratory (0—6) 2 Credits Spring

Experiments on unit operations. *Prerequisites: Ch.E. 486, Ch.E. 587 and Ch.E. 588 concurrent.*

Ch.E. 593 Special Topics Credits Arr. Fall
594 Credits Arr. Spring

Various subjects studied including chemical engineering thermodynamics, unoit processes in organic synthesis, industrial chemistry, inorganic chemical technology, nuclear chemical engineering, applied kinetics, industrial stoichiometry, plant design, petroleum chemistry, catalysis. *Prerequisite: Appropriate for subject given.*

CHEMISTRY

Chem. 101 General Chemistry (3 + 3) 4 Credits Fall
102 Gen. Chem. & Introductory Qual. Anal. (3—3) 4 Credits Spring

Integrated course in 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) or (3 + 3) 3 or 4 Credits Fall
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. *Prerequisites: Math. 102, E.S. 112, high school chemistry or Chem. 104 or Chem. 101 recommended.*

Spring Semester: Continuation of Chem. 201. Chemistry of the principal elements, nuclear chemistry, brief introduction to organic chemistry. Laboratory will be quantitative work. *Prerequisites: Chem. 102 or Chem. 201, Math. 102, and E.S. 112.*

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. *Prerequisites: Chem. 102 or 202, and 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. *Prerequisites: 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. *Prerequisites: Chem. 223 or Chem. 321.*

Chem. 321 Organic Chemistry (3—3) 4 Credits Fall
322 4 Credits Spring

Basic principles of organic chemistry; preparation and properties of simple aliphatic and aromatic compounds. For Chemistry, Chemical Engineering, Premedical, Biochemistry, Science, etc. *Prerequisites: 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 the 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+0) — 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. Credit allowed only once.

Chem. 493 Special Topics — Credits Arr. — Fall
494 — Credits Arr. — 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. 501 Inorganic Chemistry (3+0) or (3+3) — 3 or 4 Credits — Fall
502 — 3 or 4 Credits — Spring

Meet all requirements of Chem. 401 or 402, plus additional assignments as required by instructor.

Chem. 521 Organic Chemistry (3+3) — 4 Credits — Fall
522 — 3 or 4 Credits — Spring

An introduction to Organic Chemistry for graduate students not majoring in Chemistry or Chemical Engineering. *Prerequisites: Graduate standing and one year of college chemistry. Laboratory is required in Chem. 521 only.*

Chem. 525 Organic Qualitative Analysis (1+6) — 3 Credits — Fall

Meet all requirements of Chem. 425, plus additional assignments as required by instructor.

Chem. 531 Physical Chemistry (3+3) — 4 Credits — Fall
532 — 4 Credits — Spring

Meet all requirements of Chem. 331 or Chem. 332, plus additional assignments as required by instructor.

Chem. 551 Biochemistry (3+3) — 4 Credits — Fall
552 — 4 Credits — Spring

Meet all requirements of Chem. 451 or Chem. 452, plus additional assignments as required by instructor.

Chem. 586 Chemical Thermodynamics (3+0) — 3 Credits — Spring

Meet all requirements of Chem. 486, plus additional problem assignments.

Chem. 591 Seminar (1+0) — 1 Credit — Fall
592 — 1 Credit — Spring

Chem. 593 Special Topics — Credits Arr. — Fall
594 — Credits Arr. — Spring

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, with applications to the 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) with emphasis on 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 alternate years; next offered 1964-5.*

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

Topics from the following areas: vitamins and hormones, carbohydrates, physical biochemistry, nucleic acids, lipids, enzymes, protein chemistry; intermediary metabolism, oxidative enzyme systems, pathways of metabolism, biochemistry of the cell nucleus, etc. *Prerequisite: One year of biochemistry or one year of organic chemistry or by permission.*

Chem. 691 Seminar (1+0) — 1 Credit — Fall
692 — 1 Credit — Spring

Reviews of current research.

Chem. 693 Special Topics — Credits Arr. — Fall
694 — Credits Arr. — Spring

Various subjects studied including kinetics, thermodynamics, statistical mechanics, photochemistry, colloid chemistry, nuclear chemistry, etc.

Chem. 697 Thesis — Credits Arr. — Fall
698 — Credits Arr. — Spring

CIVIL ENGINEERING

C.E. 116 Mapping (2+3) — 3 Credits — Spring

Maps and scales, compass surveys, stadia, plane table, altimeter surveying, U.S. Public Land Systems, use of aerial photos for mapping, height measurements with parallax bar, elementary photo interpretation. *Offered in alternate years.*

C.E. 334 Physical Properties of Materials (1+6) — 3 Credits — Spring

Physical properties, durability and manufacturing of materials commonly used in engineering. Design of concrete mixes, physical tests. *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

Field astronomy, adjustment of level nets, triangulation and traverses. State coordinate systems, cadastral surveys, curves. *Prerequisite: E.S. 207.*

C.E. 422 Foundation Engineering (2+0) — 2 Credits — Spring

Principles of foundation action, analysis of action and design of 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 — Fall

Statically determinate structures. Loadings. Graphical and analytical solutions for stresses and deflections. Indeterminate frames. Influence lines. *Prerequisite: 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. 331.*

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 Spring

C.E. 493 Special Topics — Credits Arr. Fall
494 — Credits Arr. Spring

C.E. 499 Advanced Engineering Problems (1+0) or (2+0) — 2 Credits Fall

General problems drawn from science and engineering. This course is in preparation for registration for Professional-Engineer-in-Training.

C.E. 620 Civil Engineering Construction (3+0) — 3 Credits

Construction equipment and methods, construction management and accounting, construction estimates and costs. *Prerequisites: 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. 691 Graduate Seminar (1+0) — 1 Credit Fall
692 — 1 Credit Spring

Reports and papers on engineering topics. Practice in public speaking. *Prerequisite: Consent of instructor.*

C.E. 693 Special Topics — Credits Arr. Fall
694 — Credits Arr. Spring

Various subjects studied. *Prerequisite: Consent of instructor.*

C.E. 697 Thesis — Credits Arr. Fall
698 — Credits Arr. Spring

Individual study or research for students of special aptitude.

CLASSICS

Classics 101 Introductory Classical Latin or Greek (5+0) — 5 Credits Fall
102 — 5 Credits Spring

Rapid acquisition of a reading knowledge of Classical Latin or Greek. Fundamentals of grammar and immediate work with classical texts. *Offered as demand warrants.*

Classics 221, 321 Studies in Latin or Greek Literature (3+0) — 3 Credits Fall
222, 322 — 3 Credits Spring

Selected readings in Classical Latin or Greek. *Admission by arrangement. Offered as demand warrants. Students may repeat course for credit when topic varies.*

Classics 493 Special Topics — Credits Arr. Fall
494 — Credits Arr. Spring

Various subjects in Latin or Greek. Designed for advanced students. *Admission by arrangement. Offered as demand warrants.*

Classics 521 Studies in Latin or Greek Literature (3+0) — 3 Credits Fall
522 — 3 Credits Spring

Meet all requirements of Classics 321-322 and complete additional work as required by the instructor. *Students may repeat course for credit when topic varies. Offered as demand warrants.*

Classics 593 Special Topics Credits Arr. Fall
594 Credits Arr. Spring

Meet all requirements of Classics 493-494 and complete additional work as required by the instructor. *Offered as demand warrants.*

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, and international economic relations.

Econ. 322 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. 323 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: Principles, Problems and Policies (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 Fiscal Theory and Policy (3+0) 3 Credits Spring

Sources and uses of money and credit in modern day 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 1965-6.*

Econ. 359 Government and Private Enterprise (3+0) 3 Credits Fall

(See B.A. 359 for course description)

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 economics 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 fluctuations; 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 1850. *Prerequisite: Econ. 121, Econ. 122 and Hist. 232.*

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 by 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. 525 History of Economic Thought (3+0) 3 Credits Fall or Spring

Meet all requirements of Econ. 425 and complete additional work as required by the instructor. *Offered as demand warrants.*

Econ. 532 Economic History of the United States (3+0) 3 Credits Spring

Meet all requirements of Econ. 432 and complete additional work as required by the instructor.

Econ. 535 Economics of Resources (3+0) 3 Credits Fall

Meet all requirements of Econ. 435 and complete additional work as required by the instructor.

Econ. 563 International Economics (3+0) 3 Credits Fall or Spring
564

Meet all requirements of Econ 463/464 and complete additional work as required by the instructor.

Econ. 593 Special Topics Arr. Fall
594 Arr. Spring

Econ. 691 Seminar in Economic Theory Credits Arr. Fall
692 Credits Arr. Spring

Econ. 697 Thesis Credits Arr.
698 Credits Arr.

EDUCATION

Ed. 121 Introduction to Education (2+0) 2 Credits Fall

Aims and practices of the public school. Preparation for dealing with such problems as personal adjustment, acquiring reading skill, and methods of study. Opportunity for individual work.

Ed. 202 Audio-Visual Education (2+1) 2 Credits Spring

Selection and use of audio-visual materials in teaching and learning at all levels of education. Models, maps, charts, radio and television programs, recording, flat pictures, slides, film strips and motion pictures.

Ed. 206 Teaching of Arithmetic (2+0) 2 Credits Spring

Present day concepts, methods and materials. *Prerequisite: Math. 205.*

Ed. 301 Social Studies (3+1) 3 Credits Fall

Methods and materials adaptable to the present-day curriculum in the social studies. Open to students of both the elementary and secondary curricula.

Ed. 302 Language Arts (3+0) 3 Credits Spring

Materials and methods in the teaching of reading, spelling, language, and writing in the elementary grades.

Ed. 304 Literature for Children (3+0) 3 Credits Spring

Suitable literature, selection of library books, practice in story telling.

Ed. 306 Teaching of Science in Elementary Schools (2+0) 3 Credits Spring

Present day concepts, methods, and materials of teaching science.

Ed. 313 Educational Psychology (3+0) 3 Credits Fall

Application of the principles of psychology and human development to classroom teaching and learning. *Prerequisite: Psy. 101 and Psy. 301 or 302.*

Ed. 321 The Secondary School (3+0) 3 Credits Fall

Development of a working concept of the secondary school, its aims, curriculum, organization, and practices.

Ed. 323 Small Schools (2+0) 2 Credits Fall

Basic course for students planning to teach in small schools. Consideration of special problems in organization and methods. The small school in Alaska serves as the focal point for discussion and instruction.

Ed. 332 Tests and Measurements (3+0) 3 Credits Spring

Theory and practice of educational and psychological measurement to make effective use of available tests and scales and aid in the construction of new type examinations. Practice in test construction. *Recommended Prerequisite: ED. 313.*

Ed. 345 Social Foundations of Learning (3+0) 3 Credits Spring

Impact of culture upon the 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 American social and intellectual history. *Prerequisites: Hist. 231 and 232.*

Ed. 402 Method of Teaching (3+0) 3 Credits Fall or Spring

Principles and methods of teaching management, routine, daily programs, etc. *Prerequisite: 96 collegiate credits, 10 credits of which are in education.*

Ed. 407 Methods of Teaching Home Economics (3+0) 3 Credits Fall or Spring

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.*

Ed. 408 Methods of Teaching Business Education Subjects (3+0) 3 Credits Fall or Spring

Organization and content of business education courses on the high school level; equipping a business education department, including selection, care and maintenance of equipment; and methods in teaching bookkeeping, typewriting, shorthand and transcription. *Admission by arrangement.*

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, and reading rate. New developments analyzed in reading instruction with specific emphasis on appropriate materials. Problems in organization of the classroom reading program.

Ed. 422 Philosophy of Education (3+0) 3 Credits Spring

Review of basic philosophic concepts and their historical development. Philosophy as applied to education and its related issues and problems. Examinations of contributions of outstanding educators. *Prerequisite: Senior Standing.*

Ed. 425 Public School Finance (3+0) 3 Credits Fall

Contemporary basis for raising and distributing Federal, State and Local funds for education. Problems of school financing in Alaska. *Open only to advanced students in education.*

Ed. 426 Principles and Practices of Guidance (3+0) 3 Credits Spring

Introduction to the philosophies, organization, patterns, and tools and techniques that aid the teacher and guidance personnel in preparation of students for responsible decision making in modern society. *Prerequisite: Ed. 313.*

Ed. 427 Principles of Individual Counseling (3+0) 3 Credits Fall

Examination of counseling techniques and procedures developed and used in education, social work, and on a limited basis, clinical psychology; their applications by the classroom teacher as well as the guidance specialist in assisting students with adjustment problems which fall within a normal range. *Prerequisite: Ed. 426.*

Ed. 428 Occupational Information (3+0) 3 Credits Spring

Principles and practices of vocational guidance. Emphasis is placed on sources of vocational information and its evaluation and use in educational and counseling situations. *Prerequisite: Ed. 426.*

Ed. 429 Organization, Administration and Supervision of Guidance (2+0) 2 Credits Fall

Designed for administrators, guidance personnel and others interested in developing a guidance program or in evaluating a program. Selection procedures and supervision of guidance personnel are considered. *Prerequisites: Ed. 426 or by permission of instructor.*

Ed. 432 Curriculum Development (3+0) 3 Credits Fall

Basic definition of curriculum. Present need for curriculum improvement. Criteria for selection of broad goals. Types of curriculum frameworks examined. Consideration of the organization of specific learning experiences as part of the curriculum structure. *Prerequisite: Ed. 313 and Senior Standing.*

Ed. 441 School Law (2+0) 2 Credits Fall

Rights and responsibilities of teachers, and pupils; rulings of the Attorney General; decisions of the courts, regulations of the State Board of Education. *Open only to advanced students in education.*

Ed. 442 Public School Administration (3+0) 3 Credits Spring

Fundamentals of public school administration. Relation of Federal, State and local agencies, problems incident to the administration of public school systems in Alaska. *Open only to advanced students in education.*

Ed. 444 School Business Administration (3+0) 3 Credits Spring

Principles of business management; budgetary practice; payroll management; purchasing and supply problems; safeguarding school funds. *Prerequisites: Ed. 425 or Ed. 442.*

Ed. 452 Directed Teaching (0+6) 6 Credits Fall or Spring

Teaching under supervision in either the elementary or the secondary school of Fairbanks or in a school approved by the Department of Education. The Department reserves the right to limit registration, to determine assignments, to prescribe the number of hours required for performing directed teaching and to cancel the registration of any students doing unsatisfactory work. *Prerequisite: 96 collegiate credits, 10 credits of which are in education. A minimum program of 15 hours teaching and one conference a week. May be taken concurrently with Ed. 402.*

Ed. 461 Research Credits Arr. Fall or Spring

Upon approval of the Head of the Department of Education fourth year students who have shown outstanding ability for individual study in education are permitted to undertake research during their final year in residence.

Ed. 491 Seminar Credits Arr. Fall
492 Credits Arr. Spring

Current topics in Education. *Admission by consent of the Head of the Department.*

Ed. 493 Special Topics Credits Arr. Fall
494 Credits Arr. Spring

Various subjects studied, principally by directed study, discussion and research.

Ed. 501 Social Studies (3+0) 3 Credits Fall

Meet all the requirement of Ed. 301, plus additional work as required by the instructor.

Ed. 502 Language Arts (3+0) 3 Credits Spring

Meet all the requirements of Ed. 302, plus additional work as required by the instructor.

Ed. 504 Literature for Children (3+0) 3 Credits Spring

Meet all the requirements of Ed. 304, plus additional work as required by the instructor.

Ed. 505 Science for Elementary Teachers (3+0) 3 Credits Fall

Meet all the requirements of Ed. 305, plus additional work as required by the instructor.

Ed. 506 Teaching of Science in Elementary School (2+0) 2 Credits Spring

Meet all the requirements of Ed. 306, plus additional work as required by the instructor.

Ed. 509 The Teaching of Reading (3+0) 3 Credits Fall

Meet all the requirements of Ed. 409, plus additional work as required by the instructor.

Ed. 521 The Secondary School (3+0) 3 Credits Fall

Meet all the requirements of Ed. 321, plus additional work as required by the instructor.

Ed. 522 Philosophy of Education (3+0) 3 Credits Spring

Meet all the requirements of Ed. 422, plus additional work as required by the instructor.

Ed. 523 Small Schools (2+0) 2 Credits Fall

Meet all the requirements of Ed. 323, plus additional work as required by the instructor.

Ed. 525 Public School Finance (3+0) 3 Credits Fall

Meet all the requirements of Ed. 425, plus additional work as required by the instructor.

Ed. 526 Principles of Guidance (3+0) 3 Credits Spring

Meet all the requirements of Ed. 426, plus additional work as required by the instructor.

Ed. 527 Principles of Individual Counselling (3+0) 3 Credits Fall

Meet all the requirements of Ed. 427, plus additional work as required by the instructor.

Ed. 528 Occupational Information (3+0) 3 Credits Spring

Meet all the requirements of Ed. 428, plus additional work as required by the instructor.

Ed. 529 Organization, Administration and Supervision of Guidance (2+0) 2 Credits Fall

Meet all the requirements of Ed. 429, plus additional work as required by the instructor.

Ed. 531 Curriculum Development (3+0) 3 Credits Fall

Meet all the requirements of Ed. 431, plus additional work as required by the instructor.

Ed. 532 Tests and Measurements (3+0) 3 Credits Spring

Meet all the requirements of Ed. 332, plus additional work as required by the instructor.

Ed. 541 School Law (2+0) 2 Credits Fall

Meet all the requirements of Ed. 441, plus additional work as required by the instructor.

Ed. 542 Public School Administration (3+0) 3 Credits Spring

Meet all the requirements of Ed. 442, plus additional work as required by the instructor.

Ed. 544 School Business Administration (3+0) 3 Credits Spring

Meet all the requirements of Ed. 444, plus additional work as required by the instructor.

Ed. 545 Social Foundations of Education (3+0) 3 Credits Fall

Meet all the requirements of Ed. 345, plus additional work as required by instructor.

Ed. 548 History of Education in the United States (3+0) 3 Credits Spring

Meet all the requirements of Ed. 348, plus additional work as required by instructor.

Ed. 604 Diagnosis and Correction of Reading Deficiencies (3+0) 3 Credits Spring

Nature of the reading process with an emphasis on the psychology involved in teaching of reading difficulties. Programs of testing to ascertain specific disabilities in the areas of readiness, vocabulary, word-attack, comprehension, speed, and accuracy along with specific suggestions for their correction. Newer approaches to the teaching of reading. *Prerequisite: Ed. 408, plus experience in the teaching of reading.*

Ed. 627 Techniques of Education Research (2+0) 2 Credits Fall

Techniques of research in education. Selection of topics and problems, data gathering, interpretation and the preparation of reports.

Ed. 629 Individual Tests of Intelligence (2+0) 2 Credits Fall

Various individual intelligence tests with emphasis on the revised Stanford-Binet Intelligence Scale and the Wechsler Intelligence Scales. *Prerequisite: Permission of the Instructor.*

Ed. 630 Laboratory Course in Individual Tests of Intelligence (0+6) 2 Credits Spring

Designed to provide laboratory experience in the administration of either the Revised Stanford-Binet Intelligence Scale or the Wechsler Intelligence Scales. *Prerequisite: Ed. 629 and by permission only.*

Ed. 636 Advanced Public School Administration: Cases and Concepts (2+0) 2 Credits Spring

A case study approach to public school administration; the identification and analysis of basic issues and problems; identification of pertinent data and possible solutions. *Prerequisite: Ed. 442.*

Ed. 638 Supervision and Improvement of Instruction (3+0) 3 Credits Spring

Development, purpose, organization of supervisory programs; special attention to current in-service education programs.

Ed. 691 Education Seminar Credits Arr. Fall
692 Credits Arr. **Spring**

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.*

Ed. 695 Research Education Credits Arr. Fall
696 Credits Arr. Spring

Independent project in lieu of theses. *Admission by arrangement.*

Ed. 697 Thesis Credits Arr. Fall
698 Credits Arr. Spring

Offered as demand warrants.

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 Fundamentals of Electrical Engineering (3+3) — 4 Credits — Fall
204 — 4 Credits — Spring

Basic course of electrical engineering. Analysis of alternating-current circuits using complex notation and phasor diagrams. Resonance. Transformers. Fourier analysis, the complex frequency plane. Filters. Three-phase circuits. *Prerequisite: Math. 102, credit or registration in Phys. 211 and Math. 201.*

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 1965-6.*

E.E. 403 Machines and Power (3+3) — 4 Credits — Fall
404 — 4 Credits — Spring

A one-year course in electrical machines, with an 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 1964-5.*

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. *Prerequisite: Math. 302, Phys. 431. Offered in alternate years; next offered 1964-5.*

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. *Prerequisite: E.E. 334. Offered in alternate years; next offered 1964-5.*

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. *Prerequisite: Upper-division standing in electrical engineering, mathematics, or physics, or consent of the instructor. Offered in alternate years; next offered 1965-6.*

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. *Prerequisite: E.E. 204, credit or registration in Math. 302. Offered in alternate years; next offered 1965-6.*

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. *Prerequisite: Credit or registration in E.E. 334 and E.E. 432.*

E.E. 471 Instrumentation and 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. *Prerequisite: E.E. 204. Offered in alternate years; next offered 1964-5.*

E.E. 484 Design of Electrical Systems (3+0) — 3 Credits — Spring

The design process. The class will design a simple system, with due attention to capability, reliability, cost, and availability of parts. *Prerequisite: Upper-division standing. Offered in alternate years; next offered 1965-6.*

E.E. 491 Seminar (1+0) — 1 Credit — Fall

Current topics. Students will have an opportunity to present papers. *Prerequisite: Senior standing in electrical engineering.*

E.E. 493 Special Topics — Credits Arr. — Fall
494 — Credits Arr. — Spring

Various subjects studied.

E.E. 693 Special Topics — Credits Arr. — Fall
694 — Credits Arr. — Spring

ENGINEERING MANAGEMENT

E.M. 611 Engineering Management (3+0) — 3 Credits — Fall

First course in Engineering Management. A rapid review of accounting principles; industrial accounting including cost accounting; business organization; business finance. Emphasis is on the use of data in management rather than its generation.

E.M. 612 Engineering Management (3+0) — 3 Credits — Spring

Development of the 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. *Prerequisites: E.M. 611 and E.M. 605.*

E.M. 613 Engineering Management (3+0) — 3 Credits — Spring

The human element involved in management. Labor relations, human relations, personnel administration, industrial psychology, employee relations, and labor economics from the viewpoint of the needs of a manager.

EM. 603 Arctic Engineering (2+0) — 2 Credits — Fall
604 — 2 Credits — Spring

The application of engineering, scientific and mathematic fundamentals to the problems of advancing civilization in the 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 of arctic installations. Specialists will be used as 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 an introduction to the problems of depreciation.

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 statistics, kinematics and dynamics of engineering systems. Conservation laws, oscillations, fluid mechanics, heat, and sound. *Prerequisite: Credit or registration in Math. 101 (Fall) and Math. 102 (Spring).*

E.S. 207 Measurements (1+6) — 3 Credits — Fall

Theory of measurement, precision, dispersion, distribution of error; with practice problems taken from all fields of engineering. *Prerequisite: E.S. 112.*

E.S. 208 Mechanics (3+3) 4 Credits Spring

Review of statics and dynamics of engineering systems. Moments and products of inertia, laws of motion, rotational dynamics, momentum, energy, work, power, and impulse. Vibrating systems. *Prerequisite: E.S. 112, Math. 102.*

E.S. 331 Mechanics of Materials (2+3) 3 Credits Fall

Analysis of stresses and deformation of elastic and plastic materials. Two dimensional stress distribution. Homogeneous and heterogenous systems. Determinate and indeterminate systems. *Prerequisite: 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 Spring
492 Credits Arr. Fall or Spring

Oral and written exposition on current engineering topics.

ENGLISH

Engl. A 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. L Laboratory In Usage (0+2) 0 Credits Fall-Spring

Engl. 101 Composition and Modes of Literature (3+0) 3 Credits Fall or Spring
102 3 Credits Fall or Spring

Orderly thought and its clear expression, stressing variety in both. Introduction to expository and creative literature, training the student to read perceptively, essays, short stories, poems, plays and novels. Weekly writing assignments requiring the student to comment critically on works of literature and to demonstrate his ability to carry out and document research. English A also required of any student weak in English. English 101 and 102 Honors for students highly proficient in English.

Engl. 201 Masterpieces of World Literature (3+0) 3 Credits Fall
202 3 Credits Spring

Masterworks of literature, studied for the purpose of acquiring a broad background and developing standards of literary judgment. *Fall Semester:* Homer through Dante. *Spring Semester:* Renaissance to the present. Not open to English majors. *Prerequisites: Engl. 101 and 102.*

Engl. 213 Advanced Exposition (3+0) 3 Credits Fall-Spring

Clarity and vigor in the 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 Technique 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. *Prerequisites: Engl. 101 and 102.*

EXCEPT WHERE OTHERWISE INDICATED, PREREQUISITES FOR 300 AND 400 LEVEL COURSES ARE ENGLISH 201 OR 202 FOR NON-MAJORS, AND ENGLISH 239 OR INSTRUCTOR'S PERMISSION FOR MAJORS.

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 1964-5.*

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, Spring 1964-5.*

Engl. 323 Romantic Period (3+0) 3 Credits Fall

Poetry and prose from the late 1700's to 1830. *Next offered 1965-6.*

Engl. 324 Victorian Period (3+0) 3 Credits Spring

Poetry and non-fictional prose, 1830-1902. *Next offered 1965-6.*

Engl. 328 19th Century American Prose (3+0) 3 Credits Fall

The works of Emerson, Hawthorne, Melville, Adams, Twain, Howell and James. *Next offered 1964-5.*

Engl. 336 20th Century American Prose (3+0) 3 Credits Spring

The major fiction of Lewis, Fitzgerald, Hemingway, Faulkner, and Steinbeck. *Next offered 1964-5.*

Engl. 337 20th Century American Poetry (3+0) 3 Credits Fall

The poetry of Whitman, Dickinson, Robinson, Frost, Stevens, Roethke and others. *Next offered 1965-6.*

Engl. 341 20th Century British Literature (3+0) 3 Credits Fall

Major achievements of modern British poetry and prose. *Next offered 1965-6.*

Engl. 342 20th Century Drama (3+0) 3 Credits Spring

From Chehkov to Ionesco, the major dramatists and their achievements. *Next offered 1955-6.*

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 1965-6.*

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 1964-5.*

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 Shakespearian 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 1965-6.*

Engl. 444 European Literature (3+0) — 3 Credits — Spring

Comparative studies of works in translation, from the late Medieval period to the present. *Next offered 1965-6.*

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 and British literature.

Engl. 514 Research Writing (3+0) — 3 Credits — Spring

Meet all requirements of English 314 and complete additional work as required by the instructor.

Engl. 521 Chaucer (3+0) — 3 Credits — Fall

Meet all requirements of English 421 and complete additional work as required by the instructor.

Engl. 572 History of the English Language (3+0) — 3 Credits — Spring

Meet all requirements for English 472 and complete additional work as required by the instructor.

Engl. 601 Bibliography and Methods — 3 Credits — Fall or Spring

Offered as demand warrants.

Engl. 621 Elizabethan Drama — 3 Credits — Fall
622 — 3 Credits — Spring

Offered as demand warrants.

Engl. 623 Shakespeare's History Plays — 3 Credits — Fall
624 Shakespeare's Roman Plays — 3 Credits — Spring

Offered as demand warrants.

Engl. 627 Keats — 3 Credits — Fall or Spring

Offered as demand warrants.

Engl. 635 Twentieth Century American Literature — 3 Credits — Fall or Spring

Offered as demand warrants.

Engl. 644 Twentieth Century British Literature — 3 Credits — Spring

Offered as demand warrants.

Engl. 651 The Art of the Novel — 3 Credits — Fall or Spring

Offered as demand warrants.

Engl. 661 Old English — 3 Credits — Fall or Spring

Offered as demand warrants.

Engl. 675 Middle English Literature — 3 Credits — Fall or Spring

Offered as demand warrants.

Engl. 691 Seminar — Credits Arr. — Fall
692 — Credits Arr. — Spring

Offered as demand warrants.

Engl. 693 Special Topics — Credits Arr. — Fall or Spring

Offered as demand warrants.

Engl. 697 Thesis — Credits Arr. — Fall or Spring

Offered as demand warrants.

FRENCH

Fren. 101 Elementary French (5+0) — 5 Credits — Fall
102 — 5 Credits — Spring

Rapid acquisition of a knowledge of French. Fundamentals of grammar, exercises in elementary composition and conversation.

Fren. 150 Scientific French (3+0) — 3 Credits — Spring

Rapid acquisition of a reading knowledge of scientific French. *Offered as demand warrants.*

Fren. 201 Intermediate French (3+0) — 3 Credits — Fall
202 — 3 Credits — Spring

Acquisition of an accurate and fluent reading knowledge of French. Classes conducted in French. *Prerequisite: French 102, or equivalent.*

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. *Prerequisite: French 202, or equivalent. Offered as demand warrants.*

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. 493 Special Topics — Credits Arr. — Fall
494 — Credits Arr. — Spring

Various subjects in French. Designed for advanced students. *Admission by arrangement. Offered as demand warrants.*

Fren. 521 Studies in French Literature (3+0) — 3 Credits — Fall
522 — 3 Credits — Spring

Meet all requirements of French 321-322 and complete additional work as required by the instructor. *Student may repeat course for credit when topic varies.*

Fren. 593 Special Topics — 3 Credits — Fall
594 — 3 Credits — Spring

Meet all requirements of French 493-494 and complete additional work as required by the instructor. *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) — 3 Credits — Spring

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.*

Geog. 502 Geography of Alaska (3+0) 3 Credits Spring

Meet all the requirements of Geog. 302, plus additional work as required by instructor.

Geog. 527 Cold Lands (3+0) 3 Credits Fall

Meet all the requirements of Geog. 327, plus additional work as required by instructor.

Geog. 593 Special Topics Credits Arr. Fall
594 Credits Arr. Spring

Various subjects studied. *Admission by arrangement.*

GEOLOGY

Geol. 101 Elements of Geology (3+0) 3 Credits Evening

A non-laboratory introductory combined course in physical and historical geology; the earth, its origin, the processes that affect it, the sequence of events in its evolution, and the succession of life on it. An introduction to the appreciation of the modern landscape. Not acceptable toward a degree in geology or fulfilling a laboratory science requirement.

Geol. 201 General Geology (3+3) 4 Credits Fall

Introduction to physical geology; 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. 202 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, structure sections; plant and animal life throughout geologic times. *Prerequisite: Geol. 201.*

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, simple qualitative chemical tests, and the theory and use of the petrographic microscope. *May be taken for 4 credits by arrangement. Prerequisites: Math. 101, 102, Chem. 101, 102.*

Geol. 214 Petrology (3+6) Geol 212 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 sections. *Prerequisite: Geol. 213.*

Geol. 304 Geomorphology (2+3) 3 Credits Spring

Land forms and processes which create and modify them. Laboratory and field study of physiographic features. (Field trips.) *Prerequisite: Geol. 202, 314.*

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. 201, recommended, Geol. 202, Math. 102, C.E. 104, E.S. 111, or by arrangement.*

Geol. 321 Principles of Sedimentation (2+3) 3 Credits Spring

Sources of materials, sedimentary and diagenetic processes, classification. *Prerequisite: 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, course and tuition fee. *Entrance by preregistration only.*

Geol. 400 Earth Sciences Journal Club (1+0) Credits Arr. Fall and 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. 201, recommended Biol. 305 (Invertebrate Zool.).*

Geol. 402 Principles of Stratigraphy (2+3) 3 Credits Fall or Spring

History of the development of stratigraphy, its principles and application. *Prerequisites: Geol. 201, recommended Geol. 401, 321.*

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. Offered as demand warrants.*

Geol. 410 Micropaleontology (1+3) 2 Credits Spring

Microfossils and their use in stratigraphic correlation. *Prerequisite: Geol. 202. Offered as demand warrants.*

Geol. 412 Geology of Alaska (2+3) 3 Credits Spring

Interpretation of the geology of Alaska. (Field trips.) *Prerequisites: Geol. 202, 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. 202.*

Geol. 415 Geology and Engineering Problems of Frozen Ground (3+0) 3 Credits Fall

Geological and engineering importance of seasonally and perenially 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. 201, 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, seismometry, simple elastic wave propagation.

Geol. 491 Seminar Credits Arr. Fall
492 Credits Arr. Spring

Various subjects studied. *Admission by arrangement.*

Geol. 493 Special Topics Credits Arr. Fall
494 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.

Geol. 500 Earth Sciences Journal Club (1+0) Fall-Spring

Meet all requirements of Geol. 400 and complete additional work as required by instructor.

Geol. 502 Principles of Stratigraphy (2+3) 3 Credits Spring

Meet all requirements of Geol. 402 and complete additional work as required by instructor.

Geol. 508 Map Interpretation (1+9) 4 Credits Spring

Meet all requirements of Geol. 408 and complete additional work as required by instructor.

Geol. 510 Micropaleontology (1+3) 2 Credits Spring

Meet all requirements of Geol. 410 and complete additional work as required by instructor.

Geol. 512 Geology of Alaska (2+3) 3 Credits Spring

Meet all requirements of Geol. 412 and complete additional work as required by instructor.

Geol. 513 Vertebrate Paleontology 3 Credits Fall

Meet all requirements of Geol. 413 and complete additional work as required by instructor.

Geol. 515 Geology and Engineering Problems of Frozen Ground (3+0) 3 Credits Fall

Meet all requirements of Geol. 415 and complete additional work as required by instructor.

Geol. 516 Introduction to Geochemistry (3+0) 3 Credits Spring

Meet all requirements of Geol. 416 and complete additional work as required by instructor.

Geol. 521 Principles of Seismology (3+0) 3 Credits Fall

Meet all requirements of Geol. 421 and complete additional work as required by instructor.

Geol. 602 Advanced Problems of Frozen Ground (2+0) 2 Credits Spring

Advanced topics in permafrost and seasonally frozen ground. (Field trips.) *Prerequisite: Geol. 415. Offered as demand warrants.*

Geol. 605 Glacial Geology (2+3) 3 Credits Fall

Properties, distribution, and origin of glacial deposits including principles of their stratigraphy and correlation. Processes of glacial erosion and deposition. Special reference to polar areas. (Field trips.) *Prerequisite: Geol. 304.*

Geol. 606 Pleistocene Geology (2+3) 3 Credits Spring

Geology of the Pleistocene Epoch in both glaciated and unglaciated areas. Stratigraphy and correlation of nonglacial deposits. Special reference to polar areas. (Field trips.) *Prerequisites: Geol. 304, 605, or by arrangement.*

Geol. 607 Seminar in Geology and Glaciology of Antarctica (1+0) 1 Credit Fall

Discussions of exploration, glaciology, glacial geology, sub-ice topography, geology and permafrost for the continent. One seminar. *Prerequisites: Geol. 415, 605. Offered as demand warrants.*

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. *Prerequisites: Geol. 304, 605, 606, or by arrangement. One seminar. Offered as demand warrants.*

Geol. 611 Stratigraphic Paleontology (Paleozoic) (2+3) 3 Credits Fall

North American index fossils and stratigraphy of North America and the British Isles. *Prerequisites: Geol. 401, 402. Offered in alternate years; next offered 1965-6.*

Geol. 612 Stratigraphic Paleontology (Mesozoic and Cenozoic) (2+3) 3 Credits Spring

North American index fossils and stratigraphy of North America and the British Isles. *Prerequisites: Geol. 401, 402. Offered in alternate years; next offered 1965-6.*

Geol. 622 Advanced Metamorphic Petrology (2+6) 4 Credits Spring

Prerequisites: Geol. 214, 321. Offered in alternate years; next offered 1965-6.

Geol. 624 Advanced Igneous Petrology (2+6) 4 Credits Spring

Prerequisites: Geol. 214, 321. Offered in alternate years; next offered 1964-5.

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 1964-5.*

Geol. 628 Advanced Structural Geology II (3+0) 3 Credits Spring

Structural petrology, mechanisms of folding, theoretical basis for mechanical behavior of rocks. *Prerequisites: Geol. 214, 314. Offered in alternate years; next offered 1965-6.*

Geol. 629 Principles of Paleogeographic Reconstruction (2+3) 3 Credits Fall

Sedimentary structures, petrographic data, and subsurface data are used in determining provenance, paleotectonic situation, and environment of sedimentary units; regional facies analyses. *Prerequisites: Geol. 214, 321, 402. Offered in alternate years; next offered in 1964-5.*

Geol. 631 Petroleum Geology of Northern Alaska (2+0) 2 Credits Fall

Stratigraphy, structure, paleontology, and drilling problems of the area north of the Brooks Range. *Prerequisites: Geol. 214, 321, 401, or by arrangement. Offered as demand warrants.*

Geol. 635 Seminar in Glaciology 2 Credits Fall
636 2 Credits Spring

Discussion of advanced and classical work in Greenland and Antarctica. *Prerequisites: Math. 201, Geol. 402, or by arrangement. Two seminars.*

Geol. 693 Special Topics Credits Arr. Fall
694 Credits Arr. Spring

Research in various fields.

Geol. 697 Thesis Credits Arr. Spring
698 Credits Arr. Fall

By arrangement. Transportation expenses met by the student.

Geol. 793 Special Topics Credits Arr. Fall
794 Credits Arr. Spring

Research in various fields.

Geol. 797 Dissertation Credits Arr. Fall
798 Credits Arr. Spring

GERMAN

Ger. 101 Elementary German (5+0) 5 Credits Fall
102 5 Credits Spring

Rapid acquisition of a knowledge of German. Fundamentals of grammar; exercises in elementary composition and conversation.

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

Acquisition of an accurate and fluent reading knowledge of German. Classes conducted in German. *Prerequisite: German 102, or equivalent.*

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.*

Ger. 521 **Studies in German Literature (3+0)** 3 Credits Fall
522 3 Credits Spring

Meet all requirements of German 321-322 and complete additional work as required by the instructor. *Students may repeat course for credit when topic varies.*

Ger. 593 **Special Topics** Credits Arr. Fall
594 Credits Arr. Spring

Meet all requirements of German 493-494 and complete additional work as required by the instructor. *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. 221 **English History (3+0)** 3 Credits Fall
222 3 Credits Spring

Fall Semester: Pre-Roman England 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 1964-5.

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. 231 **History of the U.S. (3+0)** 3 Credits Fall
232 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. 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 or Spring

Earliest times to the present. Establishment of Tsarist Russia; Revolution of 1917. *Offered in alternate years; next offered 1965-6.*

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 1965-6.*

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. Offered in alternate years; next offered in 1965-6.*

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 1964-5.*

Hist. 334 Diplomatic History of the U.S. (3+0) 3 Credits Fall or Spring

Foreign relations from 1775 to the present. Designed for History and Political Science majors. *Prerequisite: Hist. 231, Hist. 232. Offered in alternate years; next offered 1965-6.*

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 1965-6.*

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 1965-6.*

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 1964-5.*

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. 231, Hist. 232. Offered in alternate years; next offered 1965-6.*

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. 231, Hist. 232. Offered in alternate years; next offered 1964-5.*

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. 231, Hist. 232. Offered in alternate years; next offered 1965-6.*

Hist. 450 Twentieth Century America (3+0) 3 Credits Fall or Spring

United States from the Progressive Movement to the present day. *Prerequisite: Hist. 231, Hist. 232. Offered in alternate years; next offered 1964-5.*

Hist. 475 Introduction to Historical Method (3+0) 3 Credits Fall or Spring

Historiography (History of historical writing); methods of historical research; the preparation of bibliographies and syllabi. *Admission by arrangement.*

Hist. 493 Special Topics Credits Arr. Fall
494 Spring

Hist. 505 Europe: 1815 to 1870 (3+0) 3 Credits Fall or Spring

Meet all requirements of Hist. 305 and complete additional work as required by the instructor. *Offered in alternate years; next offered 1965-6.*

Hist. 506 Europe 1870 to 1914 (3+0) 3 Credits Fall or Spring

Meet all requirements of Hist. 306 and complete additional work as required by the instructor. *Offered in alternate years; next offered 1965-6.*

Hist. 516 The Renaissance (3+0) 3 Credits Fall or Spring

Meet all requirements of Hist. 416 and complete additional work as required by the instructor. *Offered as demand warrants.*

Hist. 530 American Colonial History (3+0) 3 Credits Fall or Spring

Meet all requirements of Hist. 430 and complete additional work as required by the instructor. *Offered in alternate years; next offered 1965-6.*

Hist. 593 Special Topics Credits Arr. Fall
504 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

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 (1+6) 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 actual construction of garments using modern method of sewing 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. 131 College Orientation (2+0) 2 Credits Fall

Freshman orientation. Perspective of the field of home economics; careers, historic background; professional point of view. Human relationships; management of resources; social training.

H.E. 211 Textiles (1+6) 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 Credits Arr. 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 (1+3) 3 Credits Fall or Spring

Selection, operation, care and efficient arrangement of household equipment for family use. *Offered as demand warrants.*

H.E. 301 Child Development (2+3) Credits Arr. Fall or Spring

Child growth and developmental patterns from birth to adolescence. Laboratory arranged for participation in nursery school. *Prerequisite: Psy. 101.*

H.E. 302 Advanced Foods (1+6) 2 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 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. 311 Costume Study: History and Design (1+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 method of sewing techniques. *Prerequisite: H.E. 113 or by arrangement.*

H.E. 401 Consumer Buying (3+0) 2 Credits Fall or Spring

Problems of the consumer in buying goods and services to satisfy wants and needs. *Offered as demand warrants.*

H.E. 402 Nursery School Teaching (0+9) 3 Credits Fall or Spring

Observation, experience and participation in the guidance of young children. *Prerequisite: H.E. or Psy. 301 and permission of the 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. 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 1965-6.*

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; next offered 1964-5.*

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.*

H.E. 501 Child Development (2+3) 3 Credits Fall or Spring

Meet all the requirements of H.E. 301, plus additional work as required by the instructor.

H.E. 504 Nutrition (3+0) 3 Credits Spring

Meet all the requirements of H.E. 304, plus additional work as required by the instructor.

H.E. 512 Clothing Problems (0+6) 2 Credits Fall or Spring

Meet all the requirements of H.E. 412, plus additional work as required by the instructor.

H.E. 513 Pattern Drafting and Draping (1+6) 3 Credits Fall or Spring

Meet all the requirements of H.E. 413, plus additional work as required by the instructor.

H.E. 545 Home Management (3+0) 3 Credits Fall or Spring

Meet all the requirements of H.E. 445, plus additional work as required by the instructor.

H.E. 546 House Planning and Furnishing (1+6) 3 Credits Fall or Spring

Meet all the requirements of H.E. 446, plus additional work as required by the instructor.

H.E. 591 Seminar Credits Arr. Fall
592 Credits Arr. Spring

Selected topics in Home Economics. *Admission by arrangement.*

H.E. 593 Special Topics Credits Arr. Fall
594 Credits Arr. Spring

Various subjects studied. *Admission by arrangement.*

JOURNALISM

Jour. 201 Introduction to Journalism (2+3) 3 Credits Fall

General survey. Structure of news stories, various news leads and feature stories; gathering and evaluation of information for simple news stories; writing of these 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 similiarly supervised experience in journalism practices. *Prerequisite: Engl. 102 or permission by instructor. 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, and 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.*

Jour. 511 Magazine Article Writing (3+0) — 3 Credits — Fall or Spring

Meet all requirements of Jour. 311 and complete additional work as required by the instructor.

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). Attention given to actual 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 also 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 — Credits Arr. — Fall
486 — 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: Linguistics 286 or 386, or speaking knowledge of Eskimo and permission of instructor. Offered as demand warrants.*

Ling. 493 Special Topics — Credits Arr. — Fall
494 — Credits Arr. — Spring

Various languages and subjects in linguistics. *Admission by arrangement. Offered as demand warrants.*

Ling. 581 Structural Linguistics and (3+0) — 3 Credits — Fall
582 Linguistics Analysis — 3 Credits — Spring

Meet all requirements of Linguistics 381-382 and complete additional work as required by the instructor. *Offered as demand warrants.*

Ling. 585 Alaskan Eskimo (3+0) — 3 Credits — Fall
586 — 3 Credits — Spring

Meet all requirements of Linguistics 385-386 and complete additional work as required by the instructor. *Offered as demand warrants.*

Ling. 588 Alaskan Athapaskan (3+0) — 3 Credits — Spring

Meet all requirements for Linguistics 388 and complete additional work as required by the instructor. *Offered as demand warrants.*

Ling. 593 Special Topics — Credits Arr. — Fall
594 — Credits Arr. — Fall

Meet all requirements of Linguistics 493-494 and complete additional work as required by the instructor. *Offered as demand warrants.*

Ling. 595 Eskimo Workshop — Credits Arr. — Spring
596 — Credits Arr. — Spring

Meet all requirements for Linguistics 485-486 and complete additional work as required by the instructor. *Offered as demand warrants.*

MATHEMATICS

Math. A Review of Alegbra (5+0) — 0 Credits — Fall and Spring

Required of those insufficiently prepared to take Math. 101. May be used to remove high school deficiency. *Five classes 1-hr.*

Math. 101 Introduction to Analysis (4+0) — 4 Credits — Fall or Spring
102 — 4 Credits — Fall or Spring

First Semester: College algebra and introductory calculus.

Second Semester: Topics in elementary calculus; analytic trigonometry, and plane and solid analytic geometry. *Prerequisite: High school trigonometry, or Math. 108 concurrently.*

Math. 103 Survey of College Mathematics (3+0) — 3 Credits — Fall
104 — 3 Credits — Spring

Survey course designed to give understanding and appreciation of mathematics. Primarily it is a terminal college course.

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 the 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 the trigonometric functions. *Prerequisite: Math. 107.*

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. 115 Foundations of Mathematics (4+0) — 4 Credits — Spring

Selected topics from arithmetic, algebra, geometry, sets, logic, elementary functions and probability.

Math. 121 Introduction to Modern Algebra — 4 Credits — Fall or Spring
122 and Analysis with Applications — 4 Credits — Fall or Spring

Sets, relations, functions, mappings, limits, continuity, differentiation, integration, differential equations, difference equations, groups, rings, fields, vectors, matrices, linear transformations, and other related topics. Not open for credit for mathematics majors. *Prerequisite: Math. 106 or 108 or equivalent. The student may enroll in Math. 201 upon completion of this sequence and Math. 109 or its equivalent.*

Math. 200 Calculus (4+0) — 4 Credits — Fall or Spring
201 — 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 108. Admission to Math 201 is also possible on completion of Math 102 or Math. 111.*

Math. 204 Elementary Probability & Statistics (3+0) 3 Credits Fall or Spring

Basic statistical concepts. Descriptive statistics, methods of presenting data, frequency distributions, mean, median, mode, standard deviation. Elementary probability. Inferential statistics, estimation of population parameters, point estimates, confidence interval estimates, tests of hypotheses. Introduction to regression, correlation, and analysis of variance. *Prerequisite: Math. 106 or Math. 108.*

Math. 205 Mathematics for Teachers (3+0) 3 Credits Fall

A background for better understanding and appreciation of the fundamental principles underlying the mathematics taught in the elementary school. *Prerequisite: Math. 115.*

Math. 302 Differential Equations (3+0) 3 Credits Fall or Spring

Nature and origin of differential equations. First order equations and their solutions, linear differential equations with constant coefficients, systems of equations, power series solutions, operational methods, physical, biological, and geometrical 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. 308 Higher Geometry (3+0) 3 Credits Spring

Advanced euclidean geometry, non-euclidean geometries, including projective and finite geometries, foundations of geometry. *Prerequisite: Math. 202.*

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 the needs of scientific and statistical calculation. Emphasis on individual student use of the IBM 1620. *Prerequisite: Math. 202 or Math. 204 or permission of the 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 309. Math. 302 is 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, nonlinear 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

Definitions, sample spaces combinatorial analysis, occupancy and ordering problems, conditional probability, Poisson, binominal, and normal distributions, random variables, expectation, law of large numbers, generating functions. *Prerequisite: Math. 202.*

Math. 372 Stochastic Processes (3+0) 3 Credits Spring

Elements of stochastic processes and their applications, including random walks, Markov chains, recurrent events, Brownian motion, and elementary queueing theory. *Prerequisite: Math. 371.*

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. 302.*

Math. 407 Mathematical Statistics (3+0) 3 Credits Fall
408 3 Credits Spring

Advanced probability theory, point estimation, tests of statistical hypotheses, confidence intervals. *Prerequisite: Math. 371.*

Math. 409 Experimental Design (3+0) — 3 Credits — Fall

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.*

Math. 493	**Special Topics (2+0)**	Credits Arr.	Fall
494		Credits Arr.	Spring

Primarily for mathematics majors. Various topics studied.

Math. 505	**Mathematics of Physics & Engineering (3+0)**	3 Credits	Fall
506		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.*

Math. 507 Vector Analysis (3+0) — 3 Credits

Fundamental operations on vectors, potential functions, gradient, divergence, and curl; applications in physics and mechanics. *Offered as demand warrants.*

Math. 591	**Seminar**	Credits Arr.	Fall
502		Credits Arr.	Spring

Various topics are selected according to needs and interests of the students to introduce them to independent study and research.

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, Lebesque 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	**Mathematical Physics (3+0)**	3 Credits	Fall
612		3 Credits	Spring

See Physics 611-612.

Math. 693	**Special Topics**	Credit Arr.	Fall
694		Credit Arr.	Spring

Various subjects studied.

Math. 697	**Thesis**	Credits Arr.	Fall
698		Credits Arr.	Spring

MECHANICAL ENGINEERING

M.E. 301 Kinematics of Machines (2+3) — 3 Credits — Fall

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. 302 Dynamics of Machines (3+3) 4 Credits Spring

A continuation of M.E. 301 with graphical and analytical analyses of forces. Balancing of machines. *Prerequisite: M.E. 301.*

M.E. 401 Machine Design (2+6) 4 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. 411 Space Conditioning (2+3) 3 Credits Fall

Principles of heating, ventilating, air conditioning, and refrigeration with practical applications. *Prerequisite: E.S. 341, E.S. 346.*

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 diffusors; 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 balancse, equipment, economics and plant layout. *Prerequisite: M.E. 413.*

M.E. 420 Industrial Processes (3+0) 3 Credits Spring

Methods and equipment used in working, welding, casting, cutting, machining and fabrication of materials. Use of jigs, fixtures, and machine tools. Selection of equipment, routing, planning, time and motion study.

M.E. 430 Instruments and Controls (2+3) 3 Credits Spring

Automatic control and instrumentation of equipment including mechanical, hydraulic, pneumatic, electric and electronic systems. *Prerequisite: All 300 level E.S. and M.E. courses.*

M.E. 440 Mechanical Engineering Laboratory (0+6) 1 Credit Spring

Experimental work with mechanical equipment, pumps and fans, heat exchangers, fuels, power plants and refrigerating machines. *Prerequisite: M.E. 413.*

METALLURGY

Met. 304 Introduction to Metallurgy (3+0) 3 Credits Fall

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. 301. Offered as demand warrants.*

Met. 493 Special Topics Credits Arr. Fall
494 Credits Arr. Spring

Various subjects studied, principally through directed reading and discussions. *Admission by arrangement.*

Met. 593 Special Topics Credits Arr. Fall
594 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; American military history; individual weapons and marksmanship; school of the soldier and exercise of command; U.S. Army and National security.

Mil. 201 Second-Year Military Science (2+1) 1½ Credits Fall
202 1½ Credits Spring

Second-year basic; American military history; map and aerial photograph 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. By arrangement.*

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. 318 Mineral Preparation Testing (1+3) 2 Credits Spring

Calculations of complex problems arising in testing and control of milling operations. Proximate analysis of coals, application of microscopy, spectroscopy and x-ray to mineral dressing problems. *Prerequisites: Min.Pr. 313 and concurrent enrollment in Min.Pr. 314.*

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. *Prerequisite: Min.Pr. 313.*

M.Pr. 493 Special Topics Credits Arr. Fall
494 Credits Arr. Spring

Various subjects studied through directed reading, discussions and laboratory work. *Admission by arrangement.*

M.Pr. 501 Froth Flotation (2+3) 3 Credits Fall

Theory and application of bulk and differential froth flotation to metallic minerals, nonmetallic minerals and coal.

M.Pr. 506 Plant Design (1+6) 3 Credits Spring

Selection, design and layout of equipment for the erection and operation of mineral and coal beneficiation plants for specific custom and milling problems.

M.Pr. 593 Special Topics — Credits Arr. — Fall
594 — Credits Arr. — Spring

Various subjects studied. *Admission by arrangement.*

M.Pr. 595 Mineral Preparation Research (1+6) — 3 Credits — Fall
596 (1+6) — 3 Credits — Spring

Designed to familiarize the student 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; and the effect of ultrasonic vibration in unit processes.

M.Pr. 697 Thesis — 3 Credits — Fall
698 — 3 Credits — Spring

Application of basic fundamentals to the actual beneficiation problems of Alaskan ores; to produce increased effectiveness in the candidates ability to organize, interpret, and present the results of research clearly, precisely and with meaning in an acceptable thesis form.

MINING ENGINEERING

Min. 102 Mining Engineering Systems A, B, C. (4+0) — 4 Credits — Spring

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 per week 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.

Can be taken in various combinations of parts A, B, C.

Min. 300 Mine Rescue First Aid — No Credit

U. S. Bureau of Mines instruction in mine rescue and first aid. *Offered as demand warrants.*

Min. 301 Mine Surveying (2+3) — 3 Credits — Fall

Surveying principles for surface and underground control of mining properties. Field and office procedures for preparation of maps and engineering data.

Min. 303 Mining Plant Engineering (3+3) — 4 Credits — Fall

Principles of mine ventilation, haulage, pumping and energy transmission systems. *Prerequisites: 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. *Prerequisite: E.S. 331.*

Min. 331 Mining Law (2+0) — 2 Credits — Fall

History of the development of mining law; essentials of mining laws of the United States and Alaska. Discussions and interpretation of important court decisions in mining litigation. *Offered as demand warrants.*

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. *Offered as demand warrants.*

Min. 405 Geophysical and Geochemical Exploration (2+3) — 3 Credits — Fall

Theory and techniques of geophysical and geochemical exploration. Chemical, gravimetric, seismic, electrical, magnetic and radioactive measurements. *Prerequisites: Chem. 202, Phys. 212.*

Min. 407 Mineral Valuation and Economics (4+0) — 3 Credits — Spring

Theory of sampling techniques, deposit and reserve calculations, and analysis of mineral economic problems. *Prerequisite: 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. *Prerequisite: Senior standing and by permission. Fee: Field trip expenses to be paid by student. Offered as demand warrants.*

Min. 493	**Special Topics**	Credits Arr.	Fall
494		Credits Arr.	Spring

Various subjects studied, principally through directed reading and discussions. *Admission by arrangement.*

Min. 496 Mining or Mineral Research (1+6) — 3 Credits — Spring

Selected mining, mineral preparation or mineral economic research problems. *Prerequisite: Senior standing or by permission.*

Min. 593	**Special Topics**	Credits Arr.	Fall
594		Credits Arr.	Spring

Various subjects studied. *Admission by arrangement.*

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.

Min. 691	**Seminar**	Credits Arr.	Fall
692		Credits Arr.	Spring

Reading and report required. *Admission by arrangement.*

Min. 697	**Thesis**	Credits Arr.	Fall
698		Credits Arr.	Spring

MUSIC

Music A	**Rudiments (2+3)**	0 Credits	Fall
B		0 Credits	Spring

Remedial course for students not qualified to enter Music 131. Clefs, note and rest values, accidentals, key signatures, intervals, triads; ear training an essential part of the course.

Music 101, 201, 301, 401	**Chorus (0+2)**	1 Credit	Fall
102, 202, 302, 402		1 Credit	Spring

Music 103, 203, 303, 403	**Orchestra (0+2)**	1 Credit	Fall
104, 204, 304, 404		1 Credit	Spring

Admission by audition.

Music 105, 205, 305, 405	**Concert Band (0+2)**	1 Credit	Fall
106, 206, 306, 406		1 Credit	Spring

Admission by audition.

Music 107, 207, 307, 407	**Chamber Music (0+2)**	1 Credit	Fall
108, 308, 308, 408		1 Credit	Spring

Students will prepare works for performance under the guidance of faculty members.

Music 109, 209, 309, 409	**ROTC Band (0+2)**	1 Credit	Fall
110, 210, 310, 410		1 Credit	Spring

Open to all cadet instrumentalists.

Music 111, 211, 311, 411	**Vocal Ensemble (0+3)**	1 Credit	Fall
112, 212, 312, 412		1 Credit	Spring

A small group picked from the University Chorus. At least one concert each semester.

Music 113, 213, 313, 413 Opera Workshop (0+2 or 4 or 6) — 1, 2, or 3 Credits — Fall
114, 214, 314, 414 — 1, 2, or 3 Credits — Spring

Study and preparation of excerpts from the standard opera literature. *Admission by audition.*

Music 121 History and Literature A (1+0) — 1 Credit — Fall
122 — 1 Credit — Spring

Survey of music history. An introductory course for Music Majors and Minors; of general interest to students in other departments.

Music 131 Theory and Composition A (1+3) — 2 Credits — Fall
132 — 2 Credits — Spring

Fall Semester: Harmony in four parts up to and including all seventh chords, and simple modulation.
Spring Semester: Ninth, eleventh, and thirteenth chords; advanced modulation; post-Wagnerian and Impressionistic harmony.
Prerequisite: Music A, or equivalent.

Music 151, 251 Class Lessons (1+0) — ½ Credit — Fall
152, 252 — ½ Credit — Spring

Class instruction in piano, voice or an 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 an 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 221 History and Literature B (1+0) — 1 Credit — Fall
222 — 1 Credit — Spring

Fall Semester: Life and works of J. S. Bach.
Spring Semester: Influence of Bach on music since his time.

Music 231 Theory and Composition B (1+3) — 2 Credits — Fall
232 — 2 Credits — Spring

Fall Semester: Counterpoint in two parts, including imitative work.
Spring Semester: Counterpoint in more than two parts, fugal exposition, passacaglia, chorale prelude.

Music 263 Accompaniment for Pianists (0+3) — 1 Credit — Fall
264 — 1 Credit — Spring

Students will serve as accompanists in the repertory class for singers, Music 363-4, and 463-4.

Music 315 Instrumental Methods (Woodwinds) (1+0) — 1 Credit — Fall

Music 316 Instrumental Methods (Brass & Percussion) (1+0) — 1 Credit — Spring

Techniques of teaching and playing orchestral instruments.

Music 321 History and Literature C (1+0) — 1 Credit — Fall
322 — 1 Credit — Spring

Fall Semester: Life and works of Haydn and Mozart. Life of Beethoven and the study of his earlier works.
Spring Semester: Later works of Beethoven, beginning with the Third Symphony. Survey of the lives and works of Schubert, Chopin, Schumann, Liszt and Brahms.

Music 323 Form and Analysis (1+0) — 1 Credit — Fall
324 — 1 Credit — Spring

Classical form as found in the works of Hadyn, Mozart and Beethoven. To be taken in conjunction with History and Literature 321 and 322.

Music 333 Improvisation for Organists (1+0) — 1 Credit — Fall
334 — 1 Credit — Spring

Improvising accompaniments, modulations, fugal expositions. *Prerequisite: Theory and Composition A and B.*

Music 343 Music Education (3+0) — 3 Credits — Fall
344 — 3 Credits — Spring

Fall Semester: Music Education in the Elementary School, from the point of view of the classroom teacher. Principle, procedures, and materials for teaching music to children in the public schools.

Spring Semester: Music Education in the Secondary School. Methods and problems of teaching music in junior and senior high school, with emphasis on the general music program. *Prerequisite: Music 131, 132 or equivalent.*

Music 363, 463 Repertory Class for Singers (0+3) — 1 Credit — Fall
364, 464 — 1 Credit — Spring

Survey of the concert and opera literature for the voice. Singers will be required to prepare selections for each class.

Piano Majors will serve as accompanists for two semesters — 2 Credits

Music 415 Instrumental Methods (Strings) (1+0) — 1 Credit — Fall
416 — 1 Credit — Spring

Techniques of teaching and playing orchestral instruments.

Music 421 History and Literature D (1+0) — 1 Credit — Fall
422 — 1 Credit — Spring

Fall Semester: Lives and works of Wagner, Richard Strauss, Schoenberg, Berg, and Webern. *Spring Semester:* A survey of music in the Twentieth Century not covered in Music 222 or 421, with special emphasis on music in the United States.

Music 423 Church Music (1+3) — 2 Credits — Fall
424 — 2 Credits — Spring

Designed especially for organists. A survey of organ literature suitable for service playing, study of music for liturgical and non-liturgical churches, principles of hymn-playing and accompaniment, and the technique of conducting from the console.

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 studied. *Admission by arrangement.*

Music 593 Special Topics — Credits Arr. — Fall
594 — Credits Arr. — Spring

Meet all requirements of Music 493 and complete additional work as required by the 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 instruction 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. *Prerequisite: 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 with emphasis on speed and meeting office standards. *Prerequisite: 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. *Prerequisite: 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. *Prerequisite: 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. *Prerequisite: Engl. 102, O.A. 105 or equivalent.*

O.A. 302 Secretarial Training (3+0) 3 Credits Spring

Business office systems, procedures, and 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 the current problems, practices, procedures and methods. Not more than a total of 2 credits to be earned by any student.

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 actual artistic production and to the role of art in society. *Offered in alternate years, next offered 1964-5.*

Phil. 332 Ethics (3+0) 3 Credits Spring

An examination of ethical theories and the basic issues of moral thought. *Offered in alternate years, next offered in 1964-5.*

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 consent of instructor.*

Phil. 481 Philosophy of Science (3+0)

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: Consent of the instructor.*

Phil. 484 Philosophy of History (3+0) 3 Credits Spring

A critical examination of the nature of history and historical inquiry. *Prerequisite: 9 credits Philosophy or Social Science.*

Phil. 493 Special Topics Credits Arr. Fall
494 Credits Arr. Spring

Various subjects studied. *Credits arranged.*

PHYSICAL EDUCATION

P.E. 101 First Year Physical Education for Women (0+3) 1 Credit Fall
102 1 Credit Spring

Required for women. A variety of activities designed to improve the physical condition, coordination and skills of the individual. Regulation gym suits must be purchased and will be required.

P.E. 105 First Year Physical Education for Men (0+3) 1 Credit Fall
106 1 Credit Spring

Required for men, except for R.O.T.C. Cadets and ex-servicemen. Activities for the acquisition of physical skills and leisure-time activities.

P.E. 107 Beginning Swimming (0+3) 1 Credit Fall or Spring

Front and back float, front and back strokes, and other basic strokes used in swimming. May be substituted for one semester of required P.E. NON-SWIMMERS only are eligible to take this course.

P.E. 108 Handball (0+3) 1 Credit Spring

Fundamentals, rules and strategy of the game of handball.

P.E. 109 Beginning Skiing (0+3) 1 Credit Fall

Fundamentals of skiing on slopes.

P.E. 111 Principles of Physical Education (3+0) 3 Credits Fall

Basic principles and philosophy of physical education; its relation to general education; biological, sociological, and psychological bases.

P.E. 113 Ice Skating (0+3) 1 Credit Fall

Fundamentals and techniques of ice skating. Outdoor and indoor activities will be conducted until ice is available.

P.E. 143 General Hygiene (2+0) 2 Credits Spring

Health promotion, disease prevention, and control; community hygiene and public health, personal hygiene.

P.E. 201 Second Year Physical Education for Women (0+3) 1 Credit Fall
202 1 Credit Spring

Continuation of P.E. 101-102.

P.E. 205 Second Year Physical Education for Men (0+3) 1 Credit Fall
206 1 Credit Spring

Continuation of P.E. 105-106.

P.E. 207 Intermediate Swimming (0+3) 1 Credit Fall or Spring

Advanced instruction in the basic strokes, stressing skill in performance and endurance; instruction in water safety and accident prevention. *Prerequisite: P.E. 107 or the ability to swim one hundred yards with good form.*

P.E. 209 Advanced Skiing (0+3) 1 Credit Fall

Learning skills of advanced slope and cross-country skiing.

P.E. 211 Theory and Practice of Soccer (0+3) 1 Credit Fall

Fundamentals, rules and strategy of the game of soccer.

P.E. 212 Theory and Practice of Individual Sports (1+3) 1 Credit Spring

For physical education majors and minors. Advanced techniques and teaching methods in individual and dual sports: tennis, badminton, table tennis, bowling and other such sports. *Prerequisites: P.E. 101-102; 201-202 or P.E. 105-106; 205-206.*

P.E. 214 Theory and Practice of Gymnastics (0+3) 1 Credit Spring

Techniques and skills of gymnastics, calisthenics, and tumbling.

P.E. 220 Archery (0+3) 1 Credit Spring

Use of bow for field or target shooting. Rules governing match shooting and field shooting. Safety practices.

P.E. 261 Rhythmics (1+3) 2 Credits Fall or Spring

Practice in skills and teaching methods of square and social dancing. Fundamentals of dance composition. *Offered as demand warrants.*

P.E. 301 Coaching of Basketball (2+0) 2 Credits Fall

Coaching and training basketball teams: rules, fundamentals, methods of offense and defense.

P.E. 302 Coaching of Track and Field (2+0) 2 Credits Spring

Training for track and field events. Form and technique; conduct of meets; construction, assembling and use of equipment.

P.E. 317 Senior Life Saving (0+3) 1 Credit Fall

Instruction in the basic skills and techniques of life saving; personal safety skills, non-swimming assists, swimming assist, 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. 320 Physical Education Activities for Elementary Teachers (3+0) 3 Credits Spring

Games, rhythmics, group activities designed to assist the elementary teacher in classroom teaching.

P.E. 330 Sports Officiating (3+1) 3 Credits Fall

Art of officiating—football, basketball, hockey, and other sports. Rules and procedures to follow. Laboratory consists of actual game officiating in the intramural program.

P.E. 346 First Aid (2+0) 2 Credits Fall or Spring

Knowledge and skills necessary to provide efficient aid and treatment in emergencies.

P.E. 400 Methods of Teaching Tumbling and Gymnastics (3+0) 3 Credits Spring

For physical education majors and minors preparing to teach P.E. in Alaska schools. Practice sessions in addition to regular class hours. *Prerequisite: P.E. 214.*

P.E. 426 Organization and Administration of Physical Education (3+0) — 3 Credits — Spring

Current problems relating to organization and administration of physical education programs at the secondary level, including management of interscholastic athletics.

P.E. 440 Prevention and Care of Athletic Injuries (3+0) — 3 Credits — Spring

Preventative first aid, therapeutic use of equipment, taping, and massage.

P.E. 458 History of Physical Education (3+0) — 3 Credits — Spring

History of physical education from fifth century (B.C.) Greece to the present time with special emphasis on programs of Germany, Denmark, Sweden, Great Britain and the United States.

P.E. 493 Special Topics — Credits Arr. — Fall
494 — Credits Arr. — Spring

Various subjects studied. *Admission by arrangement.*

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. *Prerequisite: Credit or registration in Math. 101 (Fall) and Math. 102 (Spring).*

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. *Prerequisites: Math. 102, Phys. 112 or E.S. 112, credit or registration in Math. 201 (Fall), Math. 202 (Spring).*

Phys. 275 Astronomy (3+0) — 3 Credits — Fall
276 — 3 Credits — Spring

Science elective for the general student. *Fall:* Stellar astronomy. Nature of radiation, physical properties and distribution of the stars, galactic structure and cosmology. *Spring:* The solar system. Laws of motion, the earth, the moon, planets, comets and meteors, cosmogony. Evening demonstrations both semesters. *Prerequisite: Sophomore standing. Phys. 275 not required for 276.*

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. *Prerequisite: Permission of the instructor.*

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. *Prerequisite: Sophomore standing, Phys. 281 not required for 282.*

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. *Prerequisite: Phys. 104, Math. 102.*

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. *Prerequisite: Phys. 212, Math 202, or permission of the instructor.*

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. *Prerequisite: Phys. 212, Math. 202.*

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. *Prerequisite: Junior standing, Phys. 104 or 212, Math. 102, Chem. 102, one semester of geology. Offered as demand warrants.*

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. *Prerequisite: Permission of the Instructor.*

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. *Prerequisite: Phys. 212, 332, Math. 302.*

Phys. 445 Solid State Physics (3+0) — 3 Credits — Fall

Theory of matter in the solid state, especially semiconductors. *Prerequisite: Phys. 212, Math. 202. Offered as demand warrants.*

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. 201, 202, 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+0) — 3 Credits — Fall or Spring

Introduction to stellar spectroscopy, atomic theory and astrophysics, stellar 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 by the 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 the instructor.*

Phys. 491 Physics Seminar — Credits Arr. — Spring
492 — Credits Arr. — Fall

Seminar courses in various topics selected according to needs and interests of the students. Primarily for physics majors. *Prerequisite: Permission of the instructor.*

Phys. 493 Special Topics — Credits Arr. — Fall
494 — Credits Arr. — Spring

Various subjects studied. *Admission by arrangement.*

Phys. 511 Modern Physics (4+0) — 4 Credits — Fall
512 — 4 Credits — Spring

Meet all requirements of Phys. 411-412 and complete additional work as required by the instructor. *Admission by arrangement.*

Phys. 545 Solid State Physics (3+0) — 3 Credits — Fall

Meet all requirements of Phys. 445 and complete additional work as required by the instructor. *Admission by arrangement.*

Phys. 555 Atomic and Nuclear Physics (3+0) — 3 Credits — Fall

Meet all requirements of Phys. 455 and complete additional work as required by the instructor. *Admission by arrangement.*

Phys. 560 Geophysical Prospecting (2+3) — 3 Credits — Fall or Spring

Meet all requirements of Phys. 460 and complete additional work as required by the instructor. *Admission by arrangement.*

Phys. 565 Meteorology (3+0) — 3 Credits — Fall or Spring

Meet all requirements of Phys. 465 and complete additional work as required by the instructor. *Admission by arrangement.*

Phys. 570 Astronautics (3+0) — 3 Credits — Fall or Spring

Meet all requirements of Phys. 470 and complete additional work as required by the instructor. *Admission by arrangement.*

Phys. 575 Astrophysics (3+0) — 3 Credits — Fall or Spring

Meet all requirements of Phys. 475 and complete additional work as required by the instructor. *Admission by arrangement.*

Phys. 591 Physics Seminar — Credits Arr. — Fall
592 — Credits Arr. — Spring

Meet all requirements of Phys. 491 or 492 and complete additional work as required by the instructor. *Admission by arrangement.*

Phys. 593 Special Topics — Credits Arr. — Fall
594 — Credits Arr. — Spring

Meet all requirements of Phys. 493 or 494 and complete additional work as required by the instructor. *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

Lagrange's equations, two-body problem, rigid body motion, special relativity, canonical equations, transformation theory and Hamilton-Jacobi method. *Admission by arrangement.*

Phys. 622 Statistical Mechanics (3+0) 3 Credits Fall or Spring

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

Schrödinger'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 the 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. *Admission 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 Credits Arr. Fall
684 Credits Arr. Spring

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.*

Phys. 685 Experimental Physics Credits Arr. Fall
686 Credits Arr. Spring

Advanced work in experimental physics. *Admission by arrangement. Offered as demand warrants.*

Phys. 690 Colloquium 0 Credit Fall or Spring

Phys. 691 Seminar Credits Arr. Fall
692 Credits Arr. Spring

Various topics studied. *Admission by arrangement.*

Phys. 693 Special Topics Credits Arr. Fall
694 Credits Arr. Spring

Various subjects studied. *Admission by arrangement.*

Phys. 697 Thesis Credits Arr. Fall
698 Credits Arr. Spring

Phys. 700 Review of Physics Credits Arr. Fall or Spring

A reading course in theoretical physics to review and unify from an advanced standpoint the material of the basic physics courses. Primarily for advanced graduate 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 consent of the 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 Credits Arr. Fall
792 Credits Arr. Spring

Various subjects studied. *Admission by arrangement.*

Phys. 797 Dissertation Credits Arr. Fall
798 Credits Arr. Spring

POLITICAL SCIENCE

P.S. 101 American Government (3+0) 3 Credits Fall
102 3 Credits Spring

Fall Semester: Principles and practices of constitutional democracy; American national government. Federalism, separation of powers, suffrage, representation, political parties and elections; the executive, legislative, and judicial branches.
Spring Semester: Functional and administrative practices and problems of the national government; state, territorial, and local governments.
Prerequisite: P.S. 101.

P.S. 201 Comparative Government (3+0) 3 Credits Fall

Comparative study of government and politics of major world powers. *Admission by consent of instructor.*

P.S. 203 International Relations (3+0) 3 Credits Spring or Fall

Development of internationalism in relation to nationalism and imperialism; attempts at world government: The League of Nations, and the United Nations; International law and settlement of disputes. May be taken concurrently with P.S. 102.

P.S. 211 State and Local Government (3+0) 3 Credits Fall or Spring

Organization and activities of state, territorial, and local governments of the United States; state constitutions, state executive, legislative, and judicial systems, county and city governments, and public services; problems of growing communities. *Prerequisite: P.S. 102. Offered in alternate years; next offered 1965-6.*

P.S. 221 American Political Parties (3+0) 3 Credits Fall or Spring

American party system; organization and functions of parties, suffrage, public opinion, role of pressure groups; survey of contemporary political issues. *Admission by consent of instructor. Offered in alternate years; next offered 1964-5.*

P.S. 301 Public Administration (3+0) 3 Credits Fall

Techniques and problems of administering public policy on national and state levels; relations of executive control to legislative and judicial controls. *Prerequisite: P.S. 101 and P.S. 102, or permission by instructor.*

P.S. 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 1965-6.*

P.S. 347 Contemporary Southeast Asia (3+0) 3 Credits Fall

Post independence problems. Relations among countries of region. Their role in world politics.

P.S. 351 International and Regional Organization (3+0) 3 Credits Fall or Spring

Development, structure, policies and problems of public international organizations, especially the United Nations and its specialized agencies; accomplishments and limitations of general and regional organizations. *Prerequisite: P.S. 203. Offered as demand warrants.*

P.S. 353 International Law (3+0) 3 Credits Fall

Classical international law. Law of outer space, international and regional organizations. Private international law.

P.S. 357 The Legislative Process (3+0) 3 Credits Fall or Spring

Role of the Congress as an instrument of public policy; congressional staffing; committee system; legislative tactics and leadership; relations between the executive and the Congress. *Prerequisite: P.S. 101, P.S. 102. Offered in alternate years; next offered 1954-5.*

P.S. 359 Government and Private Enterprise (3+0) 3 Credits Fall or Spring

(See B.A. 359 for course description)

P.S. 365 Contemporary Latin America (3+0) 3 Credits Fall

Economic, social and political problems of a developing area. Foreign policies of states. Organization of American States.

P.S. 411 Political Theory (3+0) 3 Credits Fall
412 3 Credits Spring

The nature and ends of the state as discussed by leading political thinkers from Plato to the present; freedom and authority; the regulation of property; law and state; democratic and authoritarian traditions. *Prerequisite: Senior standing or by arrangement.*

P.S. 422 American Political Thought (3+0) 3 Credits Fall or Spring

Main currents of American political thought from colonial times to the present. Applications in the light of contemporary political problems. Emphasis given to the Federalist and the work of John C. Calhoun. *Admission by consent of instructor. Offered in alternate years; next offered 1964-5.*

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. 102, Hist. 231 and Hist. 232. Offered in alternate years; next offered 1964-5.*

P.S. 475 Methods and Problems (3+0) 3 Credits Spring

Bibliography, critical evaluation of materials, research techniques, and special projects. Conference or seminar. *Prerequisite: Senior standing or by arrangement.*

P.S. 485 Seminar in Contemporary International Relations (3+0) 3 Credits Fall or Spring

P.S. 491 Seminar in Government and Administration Credits Arr. Fall
492 Credits Arr. Spring

P.S. 493 Special Topics Credits Arr. Fall
494 Credits Arr. Spring

P.S. 534 American Constitutional Law (3+0) 3 Credits Spring

Meet all requirements of P.S. 434 and complete additional work as required by the instructor.

P.S. 559 Government and Private Enterprise (3+0) 3 Credits Spring

(See B.A. 359.) Meet all the requirements of B.A. 359 and complete additional work as required by the instructor.

P.S. 591 Seminar Credits Arr. Spring
592 Credits Arr. Fall

Meet all requirements of P.S. 491 and 492 and complete additional work as required by the instructor.

P.S. 593 Special Topics Credits Arr Fall
594 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 Fall or Spring

Survey of the principal areas of general psychology. A continuation of Psy. 101. *Prerequisite: Psy. 101.*

Psy. 205 Statistics for the Behavioral Sciences (3+0) 3 Credits Fall

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 animal and human learning, vision, interpersonal relations, and psychodynamics. Experimental design, data collecting and analyzing, and report writing. *Prerequisite: Psy. 101 and 102, and Psy. 205.*

Psy. 214 Experimental Psychology (2+3) 3 Credits Spring

Continuation of Psy. 213. *Prerequisite: Psy. 101 and 102, Psy. 205, and Psy. 213.*

Psy. 301 Child Development (2+3) 3 Credits Fall or Spring

Child growth and developmental patterns from birth to adolescence. Laboratory arranged for participation in nursery school. *Prerequisite: Psy. 101 and 102.*

Psy. 302 Psychology of Adolescence (3+0) 3 Credits Spring

Growth and developmental patterns during the adolescent years. *Prerequisite: Psy. 101 and 102.*

Psy. 303 Industrial Psychology (3+0) 3 Credits Fall

Job and worker analysis, selection, training, fatigue, worker adjustment, morale, and labor-management relations. *Prerequisite: Psy. 101 and 102 or by permission.*

Psy. 304 Abnormal Psychology (3+0) 3 Credits Spring

Abnormalities of human behavior. *Prerequisite: Psy. 101 and 102.*

Psy. 312 Comparative 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 Fall

Survey of 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 the interpretation of sensory processes. *Prerequisite: Psy. 101 and 102.*

Psy. 406 Theories of Personality (3+0) 3 Credits Spring

Survey of 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 and experimental research in the field of human 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. *Prerequisites: 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 studied. *Admission by arrangement.*

Psy. 512 Comparative Physiological Psychology (3+0) — 3 Credits — Spring

Meet all the requirements of Psy. 312, plus additional laboratory work as required by instructor.

Psy. 593 Special Topics — Credits Arr. — Fall
594 — Credits Arr. — Spring

Various subjects studied. *Admission by arrangement.*

RUSSIAN

Russ. 101 Elementary Russian (5+0) — 5 Credits — Fall
102 — 5 Credits — Spring

Rapid acquisition of a knowledge of Russian. Fundamentals of grammar; exercises in elementary composition and conversation.

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

Acquisition of an accurate and fluent reading knowledge of Russian. Classes conducted mainly in Russian. *Prerequisite: Russian 102 or equivalent.*

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. Designed for advanced students. *Admission by arrangement. Offered as demand warrants.*

Russ. 521 Studies in Russian Literature (3+0) — 3 Credits — Fall
522 — 3 Credits — Spring

Meet all requirements for Russian 321-322 and complete additional work as required by the instructor. *Students may repeat course for credit when topic varies.*

Russ. 593 Special Topics — Credits Arr. — Fall
594 — Credits Arr. — Spring

Meet all requirements of Russian 493-494 and complete additional work as required by the instructor. *Offered as demand warrants.*

SOCIOLOGY

Soc. 101 Introduction to Sociology (3+0) — 3 Credits — Fall or Spring
102 — 3 Credits — Fall or Spring

Systematic study of man's relationship to the society in which he lives.

Soc. 105 Social Welfare (3+0) 3 Credits Spring

Social welfare functions. 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. An analysis of factors giving rise to these problems. *Prerequisite: Soc. 101 and 102.*

Soc. 205 Group Processes in Modern Society (3+0) 3 Credits Fall

Systematic study of the formation, structure, and functioning of groups. Analysis of group processes and group products. Implications of various research technique. *Prerequisite: Soc. 101 and 102.*

Soc. 207 Population (3+0) 3 Credits Fall

Analysis of world populations; its growth and decline patterns, migratory trends and ecology. Worldwide implications to current population growth. A critical review of the major theoretical contributions in the field with and introduction to demographic methods. *Prerequisite: Soc. 101 and 102.*

Soc. 209 Urban Sociology (3+0) 3 Credits Fall

Analysis of 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. *Prerequisites: 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 Sociology of 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 such policies as selective immigration, assimilationism, racism. *Prrequisite: Soc. 101 and 102.*

Soc. 304 Culture and Personality (3+0) 3 Credits Spring

Theories of the relation of variation in personality to culture and group life, in primitive and modern societies, and the influence of the social role on behavior. *Prerequisite: Soc. 101 and 102.*

Soc. 306 Community and Ecology (3+0) 3 Credits Spring

Analysis of modern, industrial, centralized society and the institutional structure of community life—political, economic, religious—with reference to its 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 Spring

Individual programs of self-help projects dealing with community needs and resources. Theoretical analysis of experienced situations. Learning by means of laboratory method. *Prerequisites: Soc. 101, 102, 106, 205, and by arrangement.*

Soc. 345 Social Foundations 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 Spring

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; next offered 1965-6.*

Soc. 405 Social Change (3+0) 3 Credits Fall

Social change in long-time perspective, with emphasis upon social movements. *Prerequisite: Soc. 101 and 102. Next offered 1965-6.*

Soc. 410 Sociological Theory (3+0) — 3 Credits — Spring

Analysis of major sociological theories and theorists of Western civilizations; a review of the 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 studied. *Admission by arrangement.*

Soc. 502 Sociology of Minority and Ethnic Groups (3+0) — 3 Credits — Spring

Meet all requirements of Soc. 302, plus additional work as required by the instructor.

Soc. 504 Sociology of Adolescence (3+0) — 3 Credits — Spring

Meet all requirements of Soc. 404, plus additional work as required by the instructor. *Offered in alternate years; next offered 1965-6.*

Soc. 545 Social Foundations of Education (3+0) — 3 Credits — Fall

Meet all the requirements of Soc. 345, plus additional work as required by the instructor.

Soc. 593 Special Topics — Credits Arr. — Fall
494 — Credits Arr. — Spring

Various subjects studied. *Admission by arrangement.*

SPANISH

Span. 101 Elementary Spanish (5+0) — 5 Credits — Fall
102 — 5 Credits — Spring

Rapid acquisition of a knowledge of Spanish. Fundamentals of grammar; exercises in elementary composition and conversation.

Span. 201 Intermediate Spanish (3+0) — 3 Credits — Fall
202 — 3 Credits — Spring

Acquisition of an accurate and fluent reading knowledge of Spanish. Classes conducted in Spanish. *Prerequisite: Spanish 102 or equivalent.*

Span. 321 Studies in Spanish Literature (3+0) — 3 Credits — Fall
322 — 3 Credits — Spring

Choice of authors, *genres*, or periods of Spanish 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 in Spanish. Designed for advanced students. *Admission by arrangement. Offered as demand warrants.*

Span. 521 Studies in Spanish Literature (3+0) — 3 Credits — Fall
522 — 3 Credits — Spring

Meet all requirements of Spanish 321-322 and complete additional work as required by the instructor. *Offered as demand warrants. Students may repeat course for credit when topic varies.*

Span. 593 Special Topics — Credits Arr. — Fall
594 — Credits Arr. — Spring

Meet all requirements of Spanish 493-494 and complete additional work as required by the instructor. *Offered as demand warrants.*

SPEECH

Sp. 251 Public Speaking I (1+2) 2 Credits Fall and Spring

Basic principles of speech, and proficiency in their use in practical speaking situations. Fundamental speech skills—good voice production, diction, bodily action, selection and organization of materials. *Prerequisite: Engl. 101 or by arrangement.*

Sp. 252 Public Speaking II (1+2) 2 Credits Fall or Spring

Study and practice in various forms of speaking—group discussion, oral reading, radio delivery, interpretative reading, platform delivery; use of the International Phonetic Alphabet as an aid in correction of individual speech defects. *Prerequisite: Sp. 251.*

Sp. 253 Phonetics (2+0) 2 Credits Fall or Spring

Practical use of the International Phonetic Alphabet. Assimilation and dialectal problems. Use in acting, teaching, speech improvement. *Prerequisite: Sp. 251 or by arrangement. Offered as demand warrants.*

Sp. 254 Voice and Diction (1+2) 2 Credits Fall

Development of fluency and clearness in the use of the speaking voice. Study and practice to improve the student's speech and eliminate faults of articulation and pronunciation; phrasing, inflection and emphasis, including individual analysis and tape recordings. *Prerequisite: Sp. 251 or by arrangement.*

Sp. 256 Argumentation and Debate (1+2) 2 Credits Fall

Theory of argumentation and debate applied to contemporary issues. Practice in briefing and presenting arguments. *Prerequisite: Sp. 251 or by arrangement.*

Sp. 257 Discussion (1+2) 2 Credits Spring

Nature and operation of discussion groups; use of evidence, reasoning, reflective thinking, group psychology, and participant and leader behavior. *Prerequisite: Sp. 251 or by arrangement.*

Sp. 261 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.

Sp. 262 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. 263 Announcing (1+2) 2 Credits Fall or Spring

Microphone techniques, the role of the announcer in broadcasting today. Fundamentals of radio announcing and their practical application. *Prerequisite: Sp. 251 or by arrangement.*

Sp. 264 Production (1+4) 3 Credits Fall or Spring

Use of studio equipment, radio-tv production techniques, radio-tv station organization, tape editing, sound effects, and television directing.

Sp. 301 Introduction to the Theater (1+4) 3 Credits Fall or Spring

Basic principles of acting developed through pantomime, improvisation, and sense-memory. The Stanislavsky Method as applied to arena and proscenium theater production. Participation as an actor or technician in one Drama Workshop production required. *Prerequisite: By arrangement.*

Sp. 302 Theater Production (1+4) 3 Credits Fall or Spring

Techniques in acting and directing small scenes for laboratory production. Principles of makeup, lighting, and production. Participation as an actor or technician in one Drama Workshop production required. Course may be repeated for a maximum of six credits. *Prerequisite: Sp. 301 or by arrangement.*

Sp. 305 Makeup for Theatre (1+2) — 2 Credits — Fall or Spring

Principles and practices of theatrical makeup designed for actors, teachers, directors and other theatre workers. Makeup materials and their use; straight and character makeup; illusory and plastic relief; national types; influence of lighting. (Students should be prepared to spend approximately $20.00 for materials.) *Offered as demand warrants.*

Sp. 320 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. 251 or by arrangement.*

Sp. 321 Clinical Methods in Speech Correction (2+2) — 3 Credits — Spring

Administration of the clinical tests of speech and application of principles of speech correction. Supervised clinical practice. *Prerequisite: Sp. 251, 253, 320, or by arrangement.*

Sp. 493 Special Topics — Credits Arr. — Fall
494 — Credits Arr. — Spring

Various subjects studied. *Admission by arrangement. Offered as demand warrants.*

WILDLIFE MANAGEMENT

W.M. 102 Conservation of Natural Resources (2+0) — 2 Credits — Fall

Conservation of renewable and non-renewable natural resources, emphasizing the United States situation.

W.M. 304 Wildlife Management Principles (2+3) — 3 Credits — Spring

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 introduced. *Prerequisite: W.M. 102, Biol. 303.*

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 or concurrent: W.M. 304 or by 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 the 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. *Prerequisites: Biol. 326, W.M. 304 and 421. Admission by arrangement.*

W.M. 491 Seminar (2+0) — 1 Credit — Fall
492 — 1 Credit — Spring

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. 504 Wildlife Management Principles (2+3) 3 Credits Spring

Meet all requirements of W.M. 304, plus additional work as required by the instructor.

W.M. 510 Wildlife Techniques (2+3) 3 Credits Spring

Meet all requirements of W.M. 410, plus additional work as required by the instructor.

W.M. 517 Wildlife Management—Forest and Tundra (2+0) 2 Credits Fall or Spring

Meet all requirements of W.M. 417, plus additional work as required by the instructor. *Offered as demand warrants.*

W.M. 519 Wildlife Management—Wetlands (2+0) 2 Credits Fall or Spring

Meet all requirements of W.M. 419, plus additional work as required by the instructor. *Offered as demand warrants.*

W.M. 521 Hydrobiology (2+3) 3 Credits Fall

Meet all requirements of W.M. 421, plus additional work as required by the instructor.

W.M. 524 Ecology of Fishes (2+3) 3 Credits Spring

Meet all requirements of W.M. 424, plus additional work as required by the instructor.

W.M. 611 Wildlife Field Trip Credits Arr. Fall
612 Credits Arr. Spring

Trips to outstanding wildlife areas to acquaint the student with the 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. 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.

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