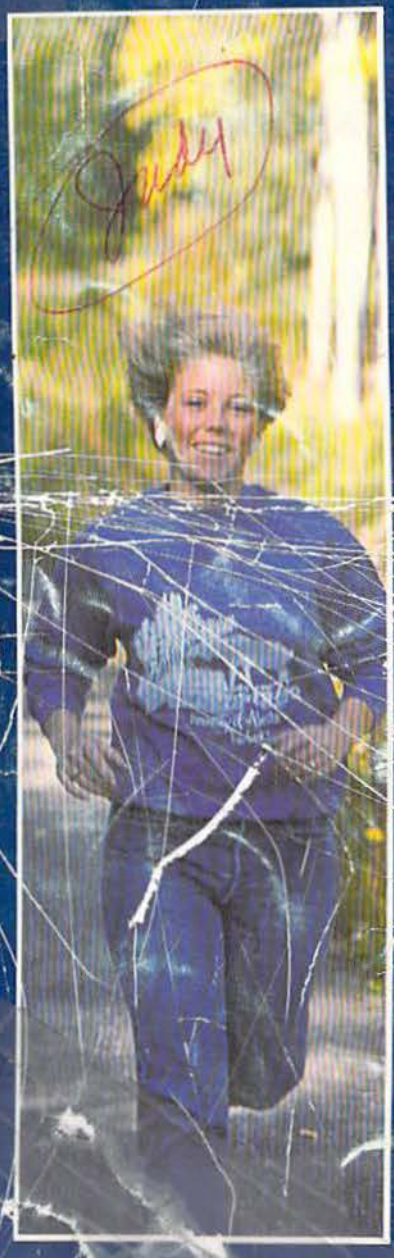
University of Alaska-Fairbanks



Challenging the mind and the spirit . . .

1987-88 Catalog

Catalog
1985-86
University of Alaska-Fairbanks

NOTICE

This catalog and its contents shall not be construed as a contract between the University of Alaska-Fairbanks and prospective or enrolled students. The catalog is merely a vehicle of information. Although every effort is made to ensure its correctness, regulations of the University and its program requirements change from time to time during the period any student is attending the University of Alaska-Fairbanks.

Accordingly if regulations or program requirements of the University in any way conflict with information contained in this catalog, the current regulations and program requirements govern. The University reserves the right to initiate changes in any of its regulations or program requirements affecting operation of the University and its program requirements; such changes shall become effective upon whatever time periods are required by applicable statutes, university regulations or program requirements.

The University of Alaska-Fairbanks is a major unit of the University of Alaska Statewide System of higher education. Under the direction of the Board of Regents, the University of Alaska System serves the people of America's largest state through university campuses at Fairbanks, Anchorage and Juneau, and community colleges at Anchorage, Bethel, Fairbanks, Kenai-Soldotna, Ketchikan, Kodiak, Kotzebue, Nome, Palmer, Sitka and Valdez. Information about the programs of each unit in the system may be obtained from that unit.

The University of Alaska-Fairbanks does not discriminate in employment, admissions, or access to or treatment in, its programs, activities and services on the basis of race, color, age, sex, national origin, handicap, or otherwise as proscribed by applicable state and federal laws and regulations including Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, Executive Order 11246, Title II of the Education Amendments of 1976, Title VI of the Civil Rights Act of 1964 as amended, and all other Federal, State, University rules, laws, regulations, and policies. Inquiries regarding the application of these laws and regulations or requests for information as to the existence and location of accessible services, activities, and facilities may be directed to: Kimberley A. Bloom, Acting Director EO/AA, Title IX Coordinator/Section 504 Coordinator, Room 109 Bunnell, University of Alaska-Fairbanks, Fairbanks, Alaska 99701, phone (907) 474-7919 OR Richard Stenard, Associate Dean of Students, Coordinator of Handicapped Student Services, 514 Gruening, University of Alaska-Fairbanks, Fairbanks, Alaska, 99701, phone (907) 474-7317 OR to the Office for Civil Rights, US Dept. of Education, Seattle.

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Sources of Information University of Alaska-Fairbanks

Admissions and Records
Director, Admissions and Records ..... (907) 474-7521 or (907) 474-7821
Alumni Association
Director, Alumni Relations 474-7081
Chancellor 474-7112
Conferences
Director, Conferences and Institutes 474-7800
Continuing Studies
Director, Continuing Studies 474-7221
Cooperative Extension Service
Director, Cooperative Extension 474-7246
Coordinator of Services for Handicapped Students 474-7317
Correspondence Study 474-7222
Fairbanks Assembly 474-7964
Fees 474-7551
Financial Aid 474-7256
Foreign Students
International Student Adviser 474-7317
General Information
Public Affairs 474-7581
Graduate Study
Director, Graduate Studies 474-7464
Honors Program 474-6612
Housing 474-7247
International Programs 474-5329
Mining Extension
School of Mineral Engineering 474-7366
Public Affairs
Director, Public Affairs 474-7581
Rural Student Services 474-7872
Student Activities 474-7037
Student Advising 474-7317
Student Affairs
Dean, Student Affairs 474-7317
Summer Sessions 474-7021
Women's Center 474-6330

The address for all departments is:
University of Alaska-Fairbanks
Fairbanks, Alaska 99701

Academic Calendar

1985 Fall Semester

Early Orientation for
New Students (EONS) ..... Sat.-Mon., Aug. 31-Sept. 2
Registration materials and advisers available to students,
ACT and Placement testing ..... Tues., Sept. 3
Registration ..... Tues., Wed., Sept. 3-4
First day of instruction ..... Thurs., Sept. 5
Last day of late registration ..... Wed., Sept. 11
Last day to apply for fall semester graduation ..... Tues., Oct. 15
Seventh and eighth week progress reports ..... Oct. 17-Oct. 31
Last day for student-initiated withdrawals ..... Wed., Nov. 6
Thanksgiving holiday ..... Thurs. and Fri., Nov. 28-29
Study day (no classes) ..... Fri., Dec. 13
Final examinations ..... Sat., Dec. 14 through Wed., Dec. 18
Grades on file with Director of Admissions
and Records ..... Mon., Dec. 23

1986 Spring Semester

Registration materials and advisers available to students
ACT and Placement testing ..... Mon., Tues., Wed., Jan. 13, 14, 15
Early Orientation for New Students (EONS) ..... Mon., Jan. 13
Registration ..... Tues., Wed., Jan. 14, 15
First day of instruction ..... Thurs., Jan. 16
Last day of late registration ..... Wed., Jan. 22
Last day to apply for spring semester graduation ..... Fri., Feb. 14
Seventh and eighth week progress reports ..... Feb. 28-Mar. 13
Last day for student-initiated withdrawals ..... Wed., Mar. 19
Spring recess ..... Mar. 24-28
All Campus Day ..... Fri., Apr. 25
Final examinations ..... Mon., May 5 through Thurs., May 8
Commencement ..... Sun., May 11
Grades on file with Director of Admissions
and Records ..... Mon., May 12

1986 Summer Session

Classes held ..... June 2-Aug. 22

1985

September

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October

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November

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1986

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31						

1986 Fall Semester

Early Orientation for
New Students (EONS) ..... Sat.-Mon., Aug. 30-Sept. 1
Registration materials and advisers available to students,
ACT and Placement testing..... Tues., Sept. 2
Registration ..... Tues., Wed., Sept. 2-3
First day of instruction ..... Thurs., Sept. 4
Last day of late registration ..... Wed., Sept. 10
Last day to apply for fall semester graduation ..... Wed., Oct. 15
Seventh and eighth week progress reports..... Oct. 16-Oct. 30
Last day for student-initiated withdrawals..... Wed., Nov. 5
Thanksgiving holiday..... Thurs. and Fri., Nov. 27-28
Study day (no classes)..... Fri., Dec. 12
Final examinations ..... Sat., Dec. 13 through Wed., Dec. 17
Grades on file with Director of Admissions
and Records ..... Noon, Mon., Dec. 22

1987 Spring Semester

Registration materials and advisers available to students
ACT and Placement testing..... Mon., Tues., Wed., Jan. 12, 13, 14
Early Orientation for New Students (EONS)..... Mon., Jan. 12
Registration ..... Tues., Wed., Jan. 13, 14
First day of instruction ..... Thurs., Jan. 15
Last day of late registration ..... Wed., Jan. 21
Last day to apply for spring semester graduation ..... Mon., Feb. 16
Seventh and eighth week progress reports..... Feb. 26-Mar. 12
Last day for student-initiated withdrawals..... Wed., Mar. 18
Spring recess..... Mar. 23-27
All Campus Day ..... Fri., Apr. 24
Final examinations ..... Mon., May 4 through Thurs., May 7
Commencement ..... Sun., May 10
Grades on file with Director of Admissions
and Records ..... Noon, Mon., May 11

(Note: Dates are subject to change.)

1986

September

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1987

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March

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June

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August

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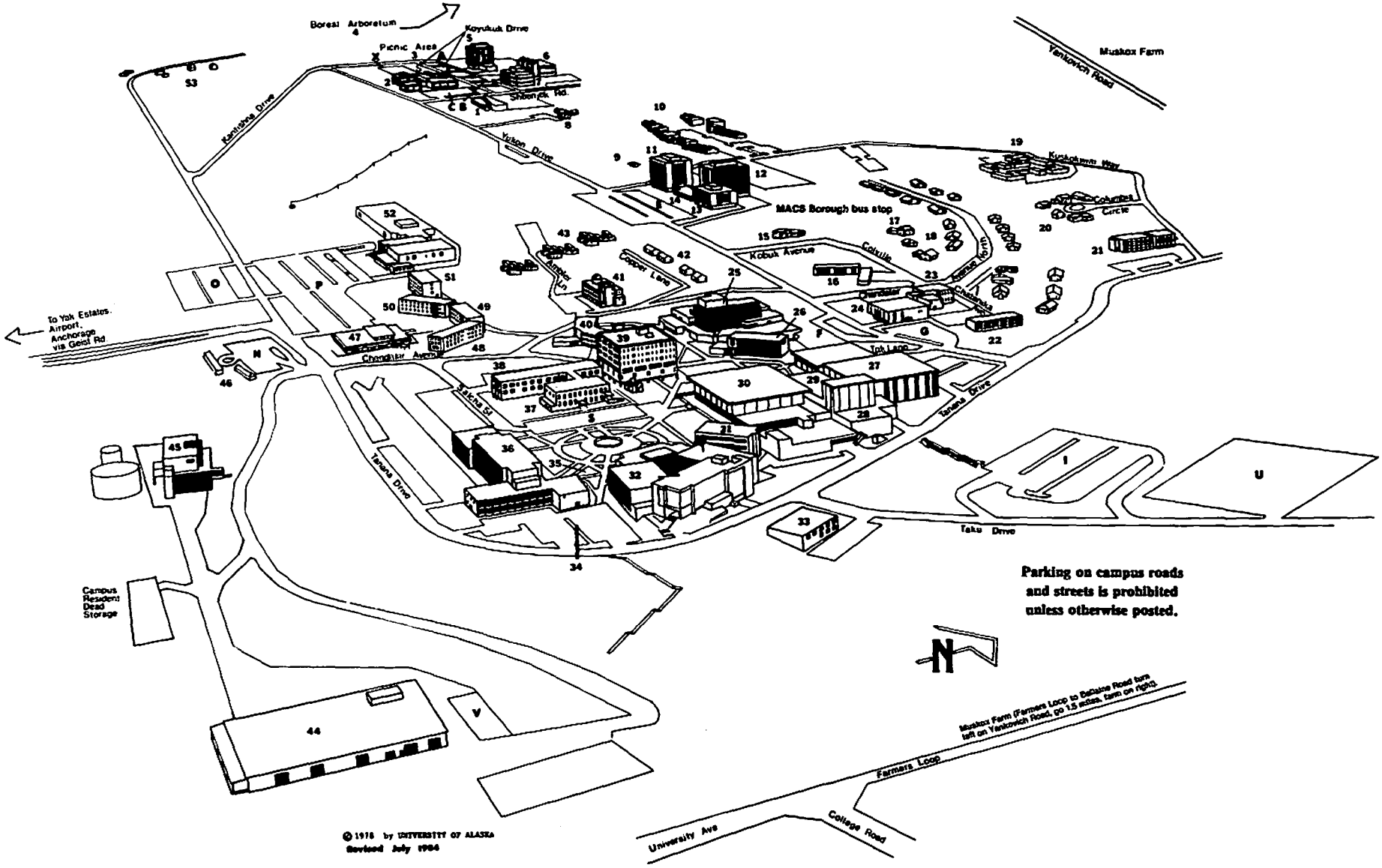

Boreal Arboretum
Koyukuk Drive
Picnic Area
Shaw Ck. Rd.
Kantishna Drive
Yukon Drive
Yankovich Road
Muskox Farm
MACS Borough bus stop
Kobuk Avenue
Cskuk
Kuskokwim Way
Columbia Circle
Chandler
Chandler Ave.
Tanana Drive
Yukon Loop
Tanana Loop
Taku Drive
Skyline Dr.
Upper Loop
Campus Resident Dead Storage
To Yak Estates, Airport, Anchorage via Geist Rd
Parking on campus roads and streets is prohibited unless otherwise posted.
N
Muskox Farm (Farmers Loop to Ballaine Road turn left on Yankovich Road, go 1.5 miles, farm on right)
Farmers Loop
University Ave
College Road
© 1978 by UNIVERSITY OF ALASKA
Revised July 1984

1. **Otto W. Geist Building**—University of Alaska Museum.
2. **Arctic Environmental Research Laboratory**—vice chancellor for research and advanced study, WAMI Medical Program, Alaska Cooperative Fishery Research Unit and Bio-Medical Library.
3. **Picnic area.**
4. **Boreal arboretum.**
5. **C.T. Elvey Building**—Geophysical Institute and department of space physics and atmospheric sciences.
6. **William A. O'Neill Building**—School of Agriculture and Land Resources Management, Agricultural and Forestry Experiment Station, Mineral Industry Research Laboratory, U.S. Geological Survey, U.S. Bureau of Mines and Institute of Marine Science.
7. **Irving Building**—Institute of Arctic Biology, College of Natural Sciences and Alaska Cooperative Wildlife Research Unit.
8. **College Magnetic and Seismological Observatory.**
9. **Rainey's Cabin**—historic site on the National Registry, not open to the public.
10. **Student Apartment Complex**—single student housing.
11. **Moore Hall**—residence hall.
12. **Bartlett Hall**—residence hall.
13. **Skarland Hall**—residence hall.
14. **Hess Commons**—housing office.
15. **President's residence.**
16. **Stuart Hall**—married student housing.
17. **Chancellor's residence.**
18. **Faculty housing.**
19. **Hess Complex**—married student housing.
20. **Faculty housing, Garden Apartments**—married student housing.
21. **Harwood Hall**—married student housing.
22. **Walsh Hall**—married student housing.
23. **Fire station.**
24. **Health, Safety and Security Building**—Center for Health and Counseling, department of security, Women's Center and department of environmental health and safety.
25. **Wood Center**—cafeteria, snack bar, The Pub, Sun-Star, Denali, Associated Students of the University of Alaska (ASUA) and student activities office.
26. **Constitution Hall**—auxiliary services, bookstore, U.S. Post Office, KSUA, United Campus Ministry, credit union and barbershop.
27. **Fine Arts Complex**—College of Liberal Arts, departments of English, art, music, humanities and philosophy, art gallery and Charles W. Davis Concert Hall.
28. **Fine Arts Theater**—KUAC-FM and KUAC-TV, Alaska Repertory Theatre, Fairbanks Symphony and department of speech and drama.
29. **Regents' Great Hall.**
30. **Elmer E. Rasmuson Library**-Instructional Media Services.
31. **Brooks Building**—School of Mineral Engineering, departments of geology/geophysics and mining and geological engineering.
32. **Duckering Building**—School of Engineering, departments of geography, physics, mathematical sciences and electrical, mechanical, petroleum and civil engineering, Engineering Experiment Station/Institute of Water Resources, electronics program and the Alaska Department of Transportation and Public Facilities research section.
33. **U.S. Forest Service Building**—Institute of Northern Forestry.
34. **Totem Pole.**
35. **Cornerstone.**
36. **Bunnell Building**—Printing and Duplicating Services, Schaible Hall, departments of biology, chemistry and journalism and broadcasting, statewide administration offices of UA president, human resource development, Alumni Services, Information Services, computer center, regents' affairs, UAITS and statewide assembly.
37. **Signers' Hall**—admissions and records, budget and cost records, business office, chancellor's office, Fairbanks Assembly, graduate studies, grant and contract services, international programs, public affairs, vice chancellor for academic affairs and vice chancellor for administration.
38. **Eielson Building**—Summer Sessions, Continuing Studies, Instructional Media Services, Conferences and Institutes, statewide Cooperative Extension Service and correspondence study, and the department of linguistics and foreign languages, purchasing and accounts payable.
39. **Gruening Building**—School of Management, College of Human and Rural Development, Center for Cross-Cultural Studies, offices of student affairs, career planning and placement, financial aid, rural student services, statewide finance offices and the departments of history, political science, behavioral sciences and human services, education, rural development, economics, accounting and business administration, the justice program and the Tanana Valley Community College office occupations laboratory.
40. **Wickersham Hall**—residence hall.
41. **Chapman Building**—departments of anthropology and Alaska Native languages and the Alaska Native Language Center.
42. **Faculty housing.**
43. **Modular residence units.**
44. **Services Building**—maintenance facilities, Tanana Valley Community College aviation technology program.
45. **Ben J. Atkinson Building**—power plant and central heating.
46. **Rural Laboratory School.**
47. **Lola Tilly Commons.**
48. **McIntosh Hall**—residence hall.
49. **Nerland Hall**—residence hall.
50. **Stevens Hall**—residence hall.
51. **Lathrop Hall**—residence hall.
52. **Ernest N. Patty Athletic Center,** gymnasium, swimming pool, rifle range, handball/racquetball courts, weight rooms, ice hockey arena, departments of military science, health, intercollegiate athletics and physical education.
53. **Agricultural and Forestry Experiment Station**

IT NEVER FAILS
October 1984

General Information

University of Alaska-Fairbanks

Special Mission

The University of Alaska-Fairbanks reflects its historic role by taking primary responsibility for the land-grant functions of the system. It is the state's primary residential institution serving students from all of Alaska as well as from other states and nations. UAF offers baccalaureate and master's degree programs in the arts, sciences, and professions as well as selected doctoral programs in areas of particular strength, such as the natural sciences and mathematics. Additionally, it offers the state's major instructional resource in music. In its undergraduate programs, this university is committed to the broad education of the student by assuring that all graduates receive a balanced education in the arts, humanities, natural and social sciences.

Professional preparation of students is directed toward engineering with particular emphasis on the unique stresses imposed by the arctic environment; petroleum and mineral engineering; management, economics and business administration with a special focus on natural resources and meeting the needs of Alaska Native corporations; high latitude agriculture; journalism; and the human service professions including education, which are directed toward multicultural groups, rural populations, and cross-cultural methodologies. Within the human services, it will provide an off-campus delivery network and upper division courses in selected areas, maximizing its efforts through cooperation with rural community colleges and extension centers.

The University of Alaska-Fairbanks is the state's center for organized activity in basic and applied research with particular emphasis on high latitude and Alaskan problems which have provided this university with a well-earned national and international reputation. Foci are directed toward space physics, marine science and high latitude studies in atmospheric science, geophysics, biology, environmental sciences, and engineering disciplines in response to global and state needs as well as enlightening humankind. It will further conduct studies relative to the definition, exploration, management and development of Alaska's natural resources, and protection of the environment, with a special emphasis on agriculture and minerals. It is also the state's major center for the study of Alaska Native cultures.

UAF further serves as a cultural center for interior Alaska by offering activities and programs in the creative and performing arts. Through its museum and through the Alaska and Polar Regions library collection, it also provides a major cultural and information resource to the state.

Student Rights Under Title IX

Title IX of the Education Amendments of 1972 was enacted to ensure that complete equality of education is afforded to all students, both male and female. This means that in every program, policy and practice at the University of Alaska-Fairbanks, there will be no discrimination on the basis of sex. Included in the areas covered by this law are: admissions, financial aid, counseling, health services, student activities and programs, and access to all course offerings, to name a few.

The Fairbanks campus Title IX coordinator is located in Room 109 of the Bunnell Building. All concerns and/or allegations that relate to Title IX are to be directed to the Fairbanks campus Title IX coordinator.

Historical Dates

May 3, 1917 — The "Alaska Agricultural College and School of Mines" created by the Territorial Legislature.

September 18, 1922 — College opens with six faculty members and six students.

July 1, 1935 — Territorial Congress changes college to the University of Alaska.

June 1947 — The first summer session established at the university.

July 1, 1974 — Tanana Valley Community College established, located on the UAF campus.

1980s — UAF continues to experience record enrollments. The university has expanded to three colleges and four professional schools, which offer degrees in 65 major areas, with a host of options within many of the degree programs. In addition, the establishment of an honors program and an international program, as well as the implementation of a development plan for a graduate school, are milestones in UAF's growth.

Accreditation/Memberships

The University of Alaska-Fairbanks is accredited as an institution of higher learning by the Commission on Colleges of the Northwest Association of Schools and Colleges.

In addition, UAF has received for certain of its programs the accreditation extended by specialized national agencies, including the American Chemical Society, the Accreditation Board for Engineering and Technology, the American Association of Museums, the Liaison Committee on Medical Education, the Accrediting Council on Education in Journalism and Mass Communication, the National Association of Schools of Music, and the Alaska State Board of Education in accordance with standards set by the National Association of State Directors of Teacher Education and Certification.

UAF is affiliated with the National Association of State Universities and Land-Grant Colleges and holds institutional membership in the American Council on Education, the American Association of State Colleges and Universities, the Council of Graduate Schools in the United States, the Western Association of Graduate Schools and the Western Interstate Commission for Higher Education.

In addition, UAF holds official designation as both a land-grant and sea-grant institution. In 1917, the federal government

gave land-grant status to the university, and in 1980 sea-grant status was added.

Transportation to the University

The city of Fairbanks is served by air, rail and highway.

The University of Alaska-Fairbanks campus is some four miles west of the Fairbanks central business district. A bus line offers service between the campus, downtown, the airport, and surrounding areas. Bus service is frequent, providing reliable transportation to and from most areas.

UAF also has on-campus shuttle service between the lower campus area and the West Ridge facilities.

Degrees and Programs

B.A.—Bachelor of Arts
B.B.A.—Bachelor of Business Administration
B.Ed.—Bachelor of Education
B.F.A.—Bachelor of Fine Arts
B.M.—Bachelor of Music
B.S.—Bachelor of Science
B.T.—Bachelor of Technology
Ed.S.—Educational Specialist
E.M.—Engineer of Mines
M.A.—Master of Arts
M.F.A.—Master of Fine Arts
M.S.—Master of Science
M.A.T.—Master of Arts in Teaching
M.B.A.—Master of Business Administration
M.C.E.—Master of Civil Engineering
M.Ed.—Master of Education
M.E.E.—Master of Electrical Engineering
Ph.D.—Doctor of Philosophy

Accounting, B.B.A.
Alaska Native Studies, B.A.
Anthropology, B.A., B.S., M.A.
Applied Linguistics, B.A.
Applied Physics, B.S.
Applied Statistics, B.S.
Arctic Engineering, M.S.
Art, B.A., B.F.A.
Asian Studies (minor only)
Athletic Coaching (minor only)
Atmospheric Sciences, M.S., Ph.D.
Biological Sciences, B.A., B.S.
Biology, M.S., M.A.T., Ph.D.
Botany, M.S.
Business Administration, B.B.A.
- Finance
- International Business
- Management
- Marketing
- Travel Industry Management

Business Administration, M.B.A.
Chemistry, B.A., B.S., M.A., M.S., M.A.T.
Civil Engineering, B.S., M.C.E., M.S.
College Student Personnel Administration, M.Ed.
Computer Information Systems (minor only)
Computer Science, B.S., M.S.
Earth Science, B.A.
Economics, B.A., B.B.A.
Education, B.Ed.
- Elementary
- Secondary

Education, B.T.
- Secondary

Education, Ed.S., School Administration
- Cross-Cultural Studies
- Public School Administration

Education, M.Ed., Elementary and Secondary
- Cross-Cultural
- Curriculum and Instruction
- Educational Administration
- Language and Literacy

Electrical Engineering, B.S., M.S., M.E.E.
Engineering Management, M.S.
English, B.A.
- Forms and Techniques of Writing
- Literature
- Teaching

English, M.A., M.A.T., M.F.A.
Environmental Quality Engineering, M.S.
Environmental Quality Science, M.S.
Fisheries Science, B.S.
- Research
- Management

Fisheries Science, M.S.
Foreign Languages, B.A.
- French
- German
- Russian
- Spanish

General Science, B.S., M.S.
Geography, B.A., B.S.
Geography and Regional Development, B.A.
Geological Engineering, B.S., M.S.
Geology, B.S.
- Economic Geology
- General Geology
- Petroleum Geology
- Solid Earth Geophysics

Geology, M.S.
- Economic Geology
- General Geology
- Petroleum Geology

Geology, Ph.D.
Geophysics, M.S.
- Snow, Ice and Permafrost Geophysics
- Solid Earth Geophysics

Geophysics, Ph.D.
Geosciences, M.A.T.
Guidance and Counseling, M.Ed.
- Elementary
- Secondary

History, B.A., M.A.T.
Humanities, B.A.
Human Services, B.A.
Interdisciplinary Studies Option, B.A., B.S., M.A., M.S., Ph.D.
Inupiaq Eskimo, B.A.
Journalism, B.A.
- Broadcast
- News-Editorial

Justice, B.A.
Linguistics, B.A.
Marine Biology, M.S.
Mathematics, B.A., B.S., M.S., M.A.T., Ph.D.
Mechanical Engineering, B.S., M.S.
Military Science/Army ROTC (minor only)
Mineral Preparation Engineering, M.S.
Mining Engineering, B.S., M.S., E.M.
Music, B.A.
- Music Education

Music, B.M.
- Music Education
- Performance

Music, M.A.
- Alaska Ethnomusicology
- Music Education
- Music History
- Performance
- Theory/Composition

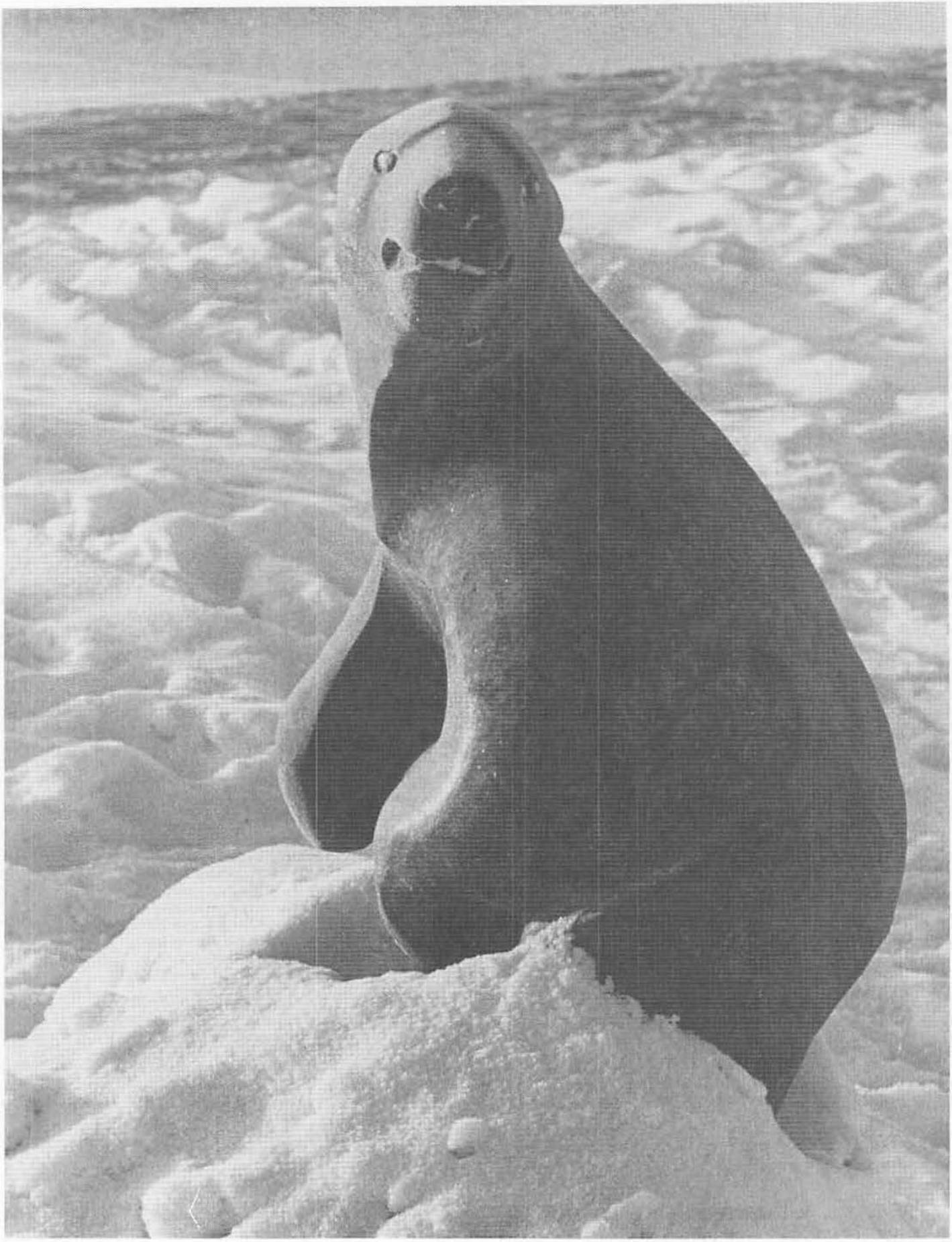
Music, M.A.T.
Natural Resources Management, B.S.
- Agriculture
- Forestry

Natural Resources Management, M.S.
Northern Studies, B.A.
Oceanography, M.S., Ph.D.
Petroleum Engineering, B.S., M.S.
Philosophy, B.A.
Physical Education, B.A., B.S.
Physics, B.A., B.S., M.S., M.A.T., Ph.D.
Political Science, B.A.
Psychology, B.A., B.S.
Psychology, M.A.
- Community

Resource Economics, M.S.
Rural Development, B.A.
- Applied Land Management
- Community Information Systems
- Local Government Administration
- Village Corporation Management
- Youth Organization

Russian Studies, B.A.
Science Management, M.S.
Social Work, B.A.
Sociology, B.A., B.S.
Space Physics, M.S., Ph.D.
Speech Communication, B.A.
Theater, B.A.
Wildlife Management, B.S.
- Management Biology
- Research Biology

Wildlife Management, M.S., Ph.D.
Yupik Eskimo, B.A.
Zoology, M.S., Ph.D.



Undergraduate Admissions

Admission Requirements for Freshmen

High School Graduates

To qualify for admission as a freshman, a high school graduate must have a high school grade point average (GPA) of 2.00(C) or higher.

Effective with the fall semester of the 1987-88 academic year, minimum standards for admission of a high school graduate as a freshman to UAF will be as follows: an applicant must be a high school graduate with a minimum overall high school grade point average of 2.00 (C). In addition, the applicant must complete with a minimum grade point average of 2.00 (C) a core curriculum of at least 11 academic credits, including at least three credits in English, two in mathematics, two in social sciences, and two in natural or physical sciences (including at least one laboratory course if offered by the high school).

An applicant who meets the admission requirements stated above is eligible for admission to UAF as a freshman. However, entrance into a specific degree program may require as a prerequisite the completion of specific high school credits beyond those required in the core curriculum. A prospective student is advised to review carefully the high school credit requirements listed for the specific degree program in which he/she is interested in order to meet those requirements prior to entrance to the university.

Non-High School Graduates

An Alaska resident at least 21 years of age who has not graduated from high school or been awarded a high school diploma on the basis of GED or military tests and who has not completed any previous college level work may be admitted. Such a student will become a bachelor's degree candidate after completion of not fewer than 30 collegiate semester hours of credit with at least a 2.00(C) average.

Admission Requirements for Transfer Students

Generally, a transfer applicant who has attended another accredited institution is eligible for admission provided he/she has a 2.00 ("C") grade point average in his/her previous college work and an honorable dismissal from the schools previously attended. An applicant desiring to enter a technical and/or scientific major may be required to present a higher grade average and evidence of completion of background courses before admission can be granted. A transfer student with fewer than 30 semester hours of transferable credit must also have a high school GPA of 2.00(C) or higher and is required to complete the ACT placement test prior to registration.

Transfer of Credit

Credit accepted for transfer to UAF which has been earned at other units of the UA system, at other accredited institutions, through military educational experiences or credit accepted by special approval shall be considered as transfer credit. Where possible, transfer credit will be equated with UAF courses.

The following regulations apply to transfer of credit:

1. Only persons accepted as degree candidates at UAF are eligible for transfer of credit.
2. A maximum of 72 semester hours of credit will be accepted from junior and community colleges, cumulative from within and outside the UA system.
3. A student in good standing (C average or higher) may transfer his/her credits from other UA units to UAF under the following conditions:
   a) Course credit at the 100 and 200 levels from the UA Community College Rural Education Extension centers shall be accepted for full credit up to a maximum of 72 semester hours.

      The evaluation of UA community college credit will follow the recommendations which appear in the *Alaska Transfer Guide* as prepared by the Alaska Commission on Postsecondary Education. Copies of the *Guide* are available at all UA and community college units.
   b) Course credit from the University of Alaska-Anchorage, the University of Alaska-Juneau, and 300, 400, and graduate level credit from CCREE centers shall be accepted at full credit.
4. Credits earned with grades of C or higher at other accredited institutions normally will be accepted by transfer. UAF reserves the right to reject work of doubtful quality or to require an examination before credit is allowed.
5. Eight elective credits may be awarded by transfer to students having completed at least one calendar year of military service. In addition, credit also may be transferred from formal service schools as recommended in the *Guide to the Evaluation of Educational Experiences in the Armed Services*, as prepared by ACE. Credit is transferred for the successful completion of Defense Activity Non-Traditional Education Support (DANTES) tests as recommended by the American Council on Education provided the score received is 50% or higher. A maximum 30 credits awarded for military service and/or formal service schooling can be applied toward a bachelor's degree. The completion of course work taken through the Community College of the Air Force is considered military credit and is subject to the same restrictions.
6. Special review for approval of the transfer credit not meeting the requirements stated above may be requested from the Director of Admissions and Records.
7. The applicability of any transfer credit to major and/or minor requirements is subject to approval by the appropriate major and/or minor department. Transfer students must fulfill the graduation and residency requirements of UAF, including those which may be required for a particular program.
8. Transfer credit is not included in UAF grade point computation.
9. The class standing of an entering transfer student is based upon the number of credits UAF accepts of his/her previous college work. A student who transfers from an accredited technical college or special purpose institution may find that many credits are considered "elective." In such a case, the student should not assume that the class standing he/she has been assigned accurately represents his/her progress toward a degree at UAF.

High School Entrance Credits

The specific high school credits suggested for entrance as a freshman, without deficiency, into any of the academic colleges or schools of the UAF, are given in this table:

	High School Credits					
University Academic Colleges or Schools	**English**	**Mathematics**	***Foreign Lang.**	**U.S. History**	**Natural or Social Science**	**Academic and Elective**
College of Liberal Arts	3	Algebra-1 Geom.-1	2	1	2	5
Anthropology	3	2	2	1	4	5
Geography	3	2	0	1	4	5
School of Agriculture and Land Resources Management	3	'Algebra-2 Geom.-1 Trig.- ½	°	1	Physics or Chemistry-1 Biology or Elective-1	7
College of Human and Rural Development	3	**2	0	1	2	7
Psychology and Sociology	3	Algebra-1 Geom/Trig-1	0	1	Physics or Chemistry-1 Biology-1 Psych. or Sociology or Natural Science- ½	5
School of Engineering	3	Algebra-2 Geom.-1 Trig.- ½	0	1	Physics or Chemistry-1	7 ½
School of Management						
Business	3	2	°	1	2	7
Economics	3	2	2	1	2	5
School of Mineral Engineering	3	Algebra-2 Geom.-1 Trig.- ½	0	1	Physics or *** Chemistry-1	7
College of Natural Sciences	3	'Algebra-2 Geom.-1 Trig.- ½	°	1	Physics or Chemistry-1 Biology or Elective-1	7

*Students who offer two units of a high school foreign language will normally enroll in a second year language. See Course Placement, page 16.

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

***Both strongly recommended for Petroleum Engineering.

'One year of algebra and one year of geometry will be acceptable for students in Agriculture and Biological Sciences not wishing to continue with advanced studies — graduate work, medicine, etc.

°Two years of French, German, or Russian language highly recommended. See specific degree programs.

Admission Requirements for Others

Auditors — An auditor is a student who enrolls for informational instruction only and does not receive academic credit, have laboratory privileges, and may not submit papers for correction and grading. An auditor must apply for admission, register formally on the designated registration dates, obtain approval of the class instructors, and pay the required fees. Fees for auditing one or more classes are the same as those paid for taking one or more courses for credit.

Foreign Students — In addition to meeting regular admission requirements, a foreign student must be able to speak, read, and write the English language well enough to do college level work successfully. All applicants from countries where English is not the native language must present a satisfactory score on the Test

of English as a Foreign Language (TOEFL). No other English language test can be used, nor may any other proof of English competency be substituted such as English credits from other schools. In addition, when preparing the I-20 form that is necessary to obtain an F-1 (student) visa (a J-1 exchange' visa may be more appropriate for some graduate students), the University must certify to the Immigration and Naturalization Service (INS) that the prospective student has been accepted for full-time enrollment and has sufficient funds to meet estimated expenses for one academic year. Foreign students on F-1 visas must maintain a full-time course load; they may not enroll as part-time students (less than 12 undergraduate or nine graduate credits). A foreign student must sign a statement that he/she has sufficient funds to pay all of his/her expenses while attending UAF, as well as the amount needed to pay his/her round trip transportation costs between his/her home and Alaska. The minimum cost for attending UAF for one school year is $5,500 or more (at least $6,300 for graduate students). This amount covers all university fees, room and board on campus, and a reasonable amount of personal expenses including transportation. It does not include summer living or cold weather clothing costs. Since the issuance of an F-1 visa requires a foreign student to affirm that he/she does not intend to make the United States his/her permanent residence, he/she may not be considered for resident tuition fees.

Since processing applications for international students takes several weeks, the application must reach Admissions and Records prior to March 15 for consideration for the fall semester. At the present time there is an extreme shortage of both single student and family (married student) housing on the UAF campus. A person cannot make reservations for on-campus housing until his/her application for admission has been accepted. Therefore, we recommend that application for admission materials be filed at least ten months prior to the date the applicant plans to enroll if he/she is interested in single student housing.

High School Students — Qualified high school students of advanced standing and ability are permitted to enroll in one or two UAF courses while attending high school. To qualify for admission while attending high school, a high school student must present written recommendation of his/her high school counselor or principal, the written approval of his/her parents, and an official transcript indicating a satisfactory GPA in his/her high school work. High school seniors with GPAs of 2.5 or higher may register for two college courses for a maximum of six credits. High school seniors with GPAs of 2.0 to 2.5 may register for one college course per semester. Juniors with GPAs of 2.75 or higher may register for one college course per semester. Qualified high school students of less than junior standing may register for one course per semester with the approval of the Director of Admissions and Records.

Special Students — In order to be admitted as a special student, one must be a high school graduate or 21 years of age or older. A special student is limited to enrollment in no more than six credits per semester and is subject to the placement examination requirements for freshman level courses. A special student may register in more than six credits in a regular length semester as long as the enrollment is in no more than two courses. A special student is subject to the academic regulations of UAF and is required to maintain a 2.00 average in order to remain in good standing. A special student is not considered a degree candidate until regular admission requirements are met and transcripts filed.

Admission Requirements for Students with Bachelor's Degrees

Non-Degree Programs — An applicant who holds a bachelor's degree but has not defined or declared his/her graduate program may be admitted as a student without class standing (WCS) if space permits. Students in this category include:

1. Those who plan to take "interest courses."
2. Those completing work for a teaching certificate.
3. Those strengthening their preparation in order to be admitted to graduate study.
4. Transient students expecting to be at UAF only briefly.
5. Students awaiting action on applications for graduate status.

Second Bachelor's Degree Programs — Those applicants who wish to complete second bachelor's degrees must formally apply for admission as undergraduate transfer students.

Course Placement

The American College Testing Program (ACT) and other placement tests must be taken before a new student with less than sophomore standing may complete registration.

On the basis of test scores, a student whose background appears to be deficient in English and mathematics may be required to take remedial English and mathematics or both in addition to the requirements of his/her chosen curricula. Achievement in these subjects is essential to success in other study areas. The basic English and mathematics courses are especially designed to assist the student in achieving competency in minimum time.

Generally, placement in Engl. 111 will be made if both ACT English and composite scores are 16 or above.

Placement in mathematics courses is usually based on a combination of the ACT mathematics score plus the number of semesters of high school mathematics completed. Generally, the following scores and semesters of high school mathematics give placement in the courses indicated:

ACT Math Score	*Number of Semesters of High School Math*	*UAF Math Placement*
26 or higher	with 1-8	See Math Department
21 to 25 with	6-8	Math 107, 161, 171
21 to 25 with	less than 6	See Math Department
19 to 20 with	7-8	Math 107, 161, 171
19 to 20 with	less than 7	See Math Department
17 to 18 with	8	Math 107, 161, 171
17 to 18 with	4-7	See Math Department
17 to 18 with	less than 4	Math 076*
13 to 16 with	1-8	Math 076*
12 or below	1-8	Math 075*

*Note: Math 075 and Math 076 are offered only through the Tanana Valley Community College.

A student continuing the study of foreign language begun in high school will be required to take a placement test. If he/she fails to place at the level appropriate to the amount of previous language study, he/she will be allowed to enroll for credit in a course that is one semester below his/her level. Work more than

one semester below the normal level will be considered remedial, and although not a prerequisite to further study, will carry no credit.

Advanced Placement

Advanced placement credit through College Entrance Examination Board (CEEB) — UAF grants advanced credit, with waiver of fees, for satisfactory performance (a score of three or higher) in the College Board Advanced Placement Tests. These tests are normally completed by students during their senior year in high school.

A student desiring CEEB Advanced Placement credit must request that an official report of his/her scores on the examination be sent to the Office of Admissions and Records and upon his/her enrollment will be awarded appropriate credit. Students may receive credit for more than one Advanced Placement examination.

Local Advanced Placement Credit

Placement in an advanced course is available in some units through local placement tests given at the time of the student's registration. Under some circumstances, advanced placement credit also may be awarded with waiver of fees after the student has satisfactorily completed the advanced course. The following advanced placement policies have been established:

English — An incoming freshman whose English ACT scores are 26 or better has the option of receiving credit for Engl. 111 in two ways: the student may enroll in a 200- or 300-level literature course and complete it with a grade of "C" or higher, or the student may wait until he/she has sophomore standing and then complete Engl. 211 or 213 with a grade of "C" or higher.

Foreign Language — A student with previous exposure to a language outside of college who wants to continue studies in that language is expected to take a placement test so that the course level most beneficial to him/her can be determined.

Upon completion of the course in which he/she has been placed with a grade of "C" or higher, the student will receive credits for that course and, in addition, for the two immediately preceding prerequisite courses, if any, unless he/she has received university credit for these already. A native speaker may not receive credit for 101 and 102 levels.

This policy does not apply to any special topics courses nor to the individual study courses inasmuch as they represent special practice activities and teach special skills, nor to literature or civilization courses.

Mathematics — Placement in mathematics courses is determined by ACT mathematics scores and the number of semesters of mathematics completed in high school. If a student is placed in a mathematics course at the 200 level or above, upon successful completion of that course with a grade of "C" or higher, the student may receive advanced placement credit for the college level courses which are prerequisite to the course completed.

Academic Bankruptcy for Returning Students

Students occasionally perform at an academic level which makes them ineligible to continue their studies, and they drop out or are dismissed from school. Subsequently, some want to resume their college work but find their previous academic record an obstacle.

Persons in this category who want an opportunity for a fresh undergraduate start at UAF may apply for readmission on the basis that their prior academic record be disregarded and they begin their college study again with no credits attempted and no credits and quality points earned. This policy may be used by a student only once and is applicable only to students enrolled at UAF and only for UAF credits. Credits earned at TVCC prior to the 1979 fall semester are eligible for bankruptcy action.

Prior to applying for admission on this basis, at least two years must have elapsed since the end of the semester in which the applicant was last in full-time attendance at school. The applicant's proposal must be approved by the dean of the college/school of the proposed degree program. The applicant must present adequate evidence to the dean that the conditions which caused the poor academic record have changed so there is now reasonable expectation that the applicant will perform satisfactorily if admitted.

It should be noted that the prior academic record remains a part of the student's overall academic record, but none of it is carried forward as part of his/her program, and none of the credits earned previously can be used in the new program. Students showing competency in any area may be allowed advanced standing (without credit) or a waiver of requirements just as any non-bankrupt student, but will not be allowed credit-by-examination for courses lost in bankruptcy. In spite of bankruptcy, the prior academic record is used in the computations for graduation honors.

Applying for Admission

When to Apply

It is recommended that seniors in high school make application for admission during the first semester of their senior year if they plan to enroll at the university during the next fall semester. Transfer and graduate students should make application at least nine months prior to the beginning of the semester in which they plan to enroll at UAF. Applications for admission should be submitted not later than August 1 for the fall semester and December 1 for the spring semester. Applications received after these dates will be processed if time permits and space is available.

At the present time there is an extreme shortage of both single student and family (married student) housing on the UAF campus. A person cannot make reservations for on-campus housing until his/her application for admission has been accepted. Therefore, we recommend that application for admission materials be filed at least ten months prior to the date the applicant plans to enroll if he/she is interested in single student housing.

How to Apply

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

1. **Application for Admission** — A $20 processing fee must accompany the completed Application for Admission form.
2. **Transcripts** — An applicant who has never previously enrolled in any college or university must have an official high school transcript sent from the high school from which the applicant has graduated or will graduate to the Office of the Director of Admissions and Records. The transcript is not acceptable if submitted directly to the university by the applicant.

An applicant who has attended other colleges and/or universities is responsible for requesting official transcripts from *each* college or university attended be sent directly to the Office of the Director of Admissions and Records. *TRANSCRIPTS WILL NOT BE ACCEPTED IF SUBMITTED TO THE UNIVERSITY BY THE APPLICANT.*

A transfer applicant with less than 30 semester hours of credit is required to submit a high school transcript as well as college

transcripts. Such an applicant should follow the instructions given above for having official transcripts from high school and other colleges and/or universities sent to the University of Alaska-Fairbanks.

Conditional and Final Acceptance

After the required credentials are received, reviewed and processed, a statement of acceptance will be mailed to the qualified applicant. The statement of acceptance will contain the conditions under which the applicant has been admitted.

Qualified applicants can be accepted for admission while enrolled in their last year of high school or another college. However, the acceptance may be conditional upon receipt of an official transcript indicating satisfactory completion of the work in progress at the time of acceptance or, in the case of a high school senior, completion of graduation requirements.

Final acceptance to UAF for the purpose of earning scholastic credit becomes complete only when all credentials have been received and accepted by the Director of Admissions and Records.

Acceptance of a student for enrollment at the University of Alaska-Fairbanks constitutes an agreement of mutual responsibility. The student agrees to abide by established rules and policies and to act in a responsible, mature manner. The university's part is to provide an appropriate academic atmosphere.

Placement Test Requirement

Results from the tests prepared by the American College Testing Program (ACT) are required for all entering freshmen and those transfer students with fewer than 30 semester hours of transferable credit. The results must be on file with the Office of the Director of Admissions and Records before approval for registration is granted. It is the responsibility of the student to have the test results sent to this office. Information concerning ACT testing centers and test 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 52240. Only the ACT test is acceptable for placement purposes. (See also "Course Placement," page 16.)

The Honors Program

The Honors Program at the University of Alaska-Fairbanks offers a special educational opportunity to those students willing to accept the challenge of a broad and comprehensive intellectual experience. Highly motivated undergraduate students are given the opportunity to acquire an appreciative understanding of the natural and social sciences, the arts, and the humanities in an atmosphere that promotes intellectual curiosity and maximizes independent learning.

The program is designed to attract and retain outstanding students and to provide them with a stimulating intellectual experience in an environment worthy of their academic abilities.

Eligibility

Undergraduate students from all disciplines are eligible for admission to the Honors Program. To qualify, new freshmen must have attained a high school GPA of no less than 3.50, a composite ACT score of no less than 26, and no individual ACT score of less than 23. National Merit Semifinalists and Finalists are automatically eligible regardless of their high school GPA. Sophomores applying to the program must have a cumulative college GPA of 3.50 and clear admission to UAF.

Admission to the Honors Program is in the fall semester. Applications to the program must be on file by May 1 of the year applying. Credentials for admission to the university must be filed separately and should be forwarded to the Office of Admissions and Records at the same time.

Undergraduate Admission Requirements in Brief

Admission Category	*Admission Requirements*
Freshman*	High school graduation 2.00 (C) GPA
Transfer Student — Less than 30 semester hours of credit*	High school GPA of 2.00 (C) 2.00 (C) GPA in previous college work
Transfer Student — 30 semester hours of credit or more	2.00 (C) GPA in previous college work
Non-High School Graduate*	21 years of age or older Alaska resident No previous college work
Special Student**	High school graduation or 21 years of age or older
Auditor	Same requirements as for appropriate category above (freshman, transfer, special, etc.)
Foreign Student	Same requirements as for appropriate category above (freshman, transfer, etc.) Acceptable TOEFL examination scores Acceptable financial statement

*Prior to registration, all freshmen and transfer students with fewer than 30 semester hours of credit must complete the ACT test which is used for course placement purposes.

**Special students are normally limited to enrollment in no more than six credits per semester. Registration for more than six credits in a regular length semester will be allowed for enrollment in not more than two courses.

Graduate Admissions

Admission to Graduate Study

Graduate study seeks to prepare the student for advanced work. It aims to give the student deeper insights and better understanding of fundamental principles. The graduate program is shaped to the needs of the individual student and is developed in terms of his/her experience, academic background, and aspirations. Earning an advanced degree entails more than the satisfactory completion of specified courses; that student must show promise and performance in productive scholarship.

The Director of Graduate Programs oversees the administration and development of policies that govern graduate studies.

In general, a student may be admitted to graduate status if he/she has a bachelor's degree from an accredited institution with at least a 3.0 (B) average in his/her major and if his/her major is deemed suitable for continuation of studies in the field of his/her choice. Equivalent accomplishments at a foreign university may be substituted. For the purposes of admission to graduate study, all grades, including those generated from retaking a course, will be included in the calculation of the grade point average. Program 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.

Students are advised that permission to enroll in graduate courses does not imply admission to graduate study. Nor may a student presume that such coursework will necessarily be applicable to a graduate program. Admission to graduate study, when approved, does not imply admission to candidacy for a degree. Any program has the option of refusing to recommend a student for candidacy for a degree.

Soon after the student is accepted, a faculty advisory committee will be set up to assist the student in planning and carrying out his/her program. (See Degree Requirements — Graduate, page 31.)

Master's Degrees

Master's degrees are offered in the humanities, social sciences, mathematics, physical and natural sciences, and professional areas such as engineering, education and business administration. Students wishing to enroll for graduate study in any of the available programs should obtain application for admission forms from the Office of Admissions and Records and follow the application procedures for graduate students.

In addition, approval of individualized programs leading to master's degrees may be possible in certain aspects of other areas or in combinations of disciplines, such as cross-cultural studies, arctic studies, linguistics, etc. A student interested in pursuing such a program should submit a brief statement with the application for admission outlining goals and describing the proposed program of study.

Several cross-discipline master's degrees are offered through cooperating departments. For example, the Master of Arts in Teaching is offered with emphasis in the following disciplines: biology, chemistry, English, geology, history, mathematics, music, and physics; the Master of Science in general science is offered in mathematics, physics, chemistry, biology, and geology. Students interested in obtaining more information about these degrees and their requirements should write to the Office of Graduate Programs.

Doctor of Philosophy Degrees

The University of Alaska-Fairbanks offers Ph.D. programs in certain areas of mathematics, physics, geophysics, geology, biological sciences, oceanography, zoophysiology, zoology and wildlife and fisheries biology.

Prospective candidates in these or other subject areas should write to the Office of Admissions and Records for application materials. Each application is reviewed by a committee for admissions both in the light of the applicant's qualifications and the faculty and facilities available on the campus relevant to the field of projected study.

WAMI Medical Education Program

Alaska WAMI students are registered concurrently at UAF and the University of Washington School of Medicine. Admission as a freshman medical student at the University of Washington School of Medicine is a prerequisite. Alaskan students may obtain their premedical training at UAF or any college/university. During the summer preceding the last year of premedical training, application for admission to the University of Washington School of Medicine is accomplished as follows:

1. Student must take the Medical College Admissions Test.
2. Student must complete the American Medical College Application Service forms indicating the University of Washington School of Medicine/University of Alaska WAMI Medical Education Program.

For further information about the WAMI Medical Education Program contact: WAMI Program Office, University of Alaska-Fairbanks, Fairbanks, Alaska 99701, (907) 474-7731.

Applying for Admission

When to Apply

It is recommended that graduate students make application for admission at least nine months prior to the beginning of the semester in which they plan to enroll at UAF. Applications for admission should be submitted not later than August 1 for the fall semester and December 1 for the spring semester. Applications received after these dates will be processed if time permits and space is available.

At the present time there is an extreme shortage of both single student and family (married student) housing on the UAF campus. A person cannot make reservations for on-campus housing until his/her application for admission has been accepted. Therefore, we recommend that application for admission materials be filed at least ten months prior to the date the applicant plans to enroll if he/she is interested in single student housing.

How to Apply — Read Carefully

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

1. Application for Admission — A $20 processing fee must accompany the completed Application for Admission form.

2. Scholastic Records — An applicant is required to have complete official transcripts of all college credits sent to UAF in support of his/her application. The applicant is responsible for requesting that these transcripts be sent to the university but transcripts will not be accepted unless they are sent directly to the Director of Admissions and Records from the other college or university attended. The applicant may not submit personal copies of transcripts.

3. Letters of Recommendation — At least three letters of recommendation are required from people capable of describing the applicant's character and his/her ability to undertake graduate study and research. The letters should be forwarded to the Director of Admissions and Records.

4. A brief description of the proposed plan of study is required for those wishing to apply for admission into a Ph.D. program or an interdisciplinary master's program.

5. Results of the Graduate Record Examination (GRE) and/or other tests, when required, must be forwarded to the Office of Admissions and Records. Applicants should refer to the admission requirements of the specific degree program for which they are applying to ascertain what tests, if any, are required.

6. Graduate foreign student applicants also should refer to the admission requirements for foreign students on page 15.

Conditional and Final Acceptance

After the required credentials are received, reviewed and processed, a statement of acceptance will be mailed to the qualified applicant. The statement of acceptance will contain the conditions under which the applicant has been admitted.

A qualified applicant can be accepted for admission while currently enrolled in his/her last semester of college. However, the acceptance may be conditional upon receipt of an official transcript indicating satisfactory completion of the work in progress at the time of acceptance and completion of graduation requirements.

Final acceptance to the university for the purpose of earning scholastic credit becomes complete only when all credentials have been received and accepted by the Director of Admissions and Records.

GRADUATE DEGREE PROGRAMS OFFERED AT UAF

Master of Arts (M.A.)
- Anthropology
- Chemistry
- English
- Music

Master of Arts in Teaching (M.A.T.)
- Biological Sciences
- Chemistry
- English
- Geology/Geosciences
- History
- Mathematics
- Music
- Physics

Master of Business Administration (M.B.A.)
- Business Administration

Master of Civil Engineering (M.C.E.)
- Civil Engineering

Master of Electrical Engineering (M.E.E.)
- Electrical Engineering

Master of Education (M. Ed.)
- College Student Personnel Administration
- Cross-Cultural Education
- Curriculum and Instruction
- Educational Administration
- Guidance and Counseling
- Language and Literacy

Master of Fine Arts (M.F.A.)
- Creative Writing

Master of Science (M.S.)
- Arctic Engineering
- Atmospheric Sciences
- Biology
- Botany
- Chemistry
- Civil Engineering
- Computer Science
- Electrical Engineering
- Engineering Management
- Environmental Quality Engineering
- Environmental Quality Science
- Fisheries Biology
- General Science
- Geological Engineering
- Geology
- Geophysics
- Marine Biology
- Mathematics
- Mechanical Engineering
- Mineral Preparation Engineering
- Mining Engineering
- Natural Resources Management
- Oceanography
- Petroleum Engineering
- Physics
- Resource Economics
- Science Management
- Space Physics
- Wildlife Management
- Zoology

Educational Specialist (Ed.S.)
- Cross-Cultural Education
- Public School Administration

Doctor of Philosophy (Ph.D.)
- Atmospheric Sciences
- Biology (Interdisciplinary)
- Geology
- Geophysics
- Mathematics
- Oceanography
- Physics
- Space Physics
- Wildlife Management (Interdisciplinary)
- Zoology (Interdisciplinary)

In addition to the programs listed above, individualized master's and doctoral degree programs may be arranged in some specialized areas for which there are not established programs or programs may be arranged for specific plans of study involving a combination of disciplines. An applicant for admission to this program must submit a brief description of the proposed program with his/her application.

Academic Regulations

Each student will be held responsible for the applicable University of Alaska-Fairbanks rules and regulations.

Academic Advising

The university considers advising students to be an integral part of the teaching function, and therefore, an important faculty responsibility. Advising provides an opportunity for close faculty-student interaction, serves to explain the university's programs and requirements and assists the student in the choice of a program consistent with his/her academic objectives and future goals.

The Director of Academic Advising is responsible for overall coordination of the advising program. Assignment of faculty members is based on the student's major. A program of special advising is provided for freshmen and students who have not declared majors. The advising of rural and Native students is available through Rural Student Services.

Academic Integrity

In an educational community whose goals include the origination and examination of ideas, the fundamental principle of the ownership of ideas must be recognized and supported. It is a violation of all educational principles to abuse academic integrity by acts of cheating or plagiarism. Such abuses defeat the purpose of education, that is, the development of the abilities to reason, research, and communicate. Whenever one uses ideas, data, or other work which is not one's own, this borrowing must be acknowledged, usually through established citation formats and procedures.

Cheating and plagiarism cases ordinarily will result in a grade of "F" being issued for the course in question. Repeated violations will subject a student to dismissal from the university.

Access to Records

Under the Family Educational Rights and Privacy Act of 1974, students are entitled to review their records. Except for directory information, no personally identifiable information will be disclosed to agencies off-campus without the written permission of the student. Records are made available for legitimate on-campus professional use on a need-to-know basis.

Public information or directory information is disclosed on a routine basis unless the student requests, in writing, to the Director of Admissions and Records that such information not be released. Forms to request that directory information not be released are available in the Office of Admissions and Records. These forms must be completed each semester. No directory information will be released during the first five working days of each semester. After that time, such information will be released when appropriate, unless otherwise requested in writing. The following is considered directory information:

1. Name.
2. Address, telephone.
3. Home address (permanent).
4. Weight and height of students on athletic teams.
5. Date of birth.
6. Dates of attendance and current class standing.
7. Major field(s) of study.
8. Degrees and awards received, including dates.
9. Participation in officially recognized activities.

Attendance

Regular attendance is expected in all classes. Unexcused absences may result in a student receiving a failing grade. It is the responsibility of the student to confer with the instructor concerning absences and to work out acceptable arrangements for making up missed work.

Auditing

A student wishing to enroll in one or more courses for informational instruction only may register as an auditor as space permits. An auditor does not receive academic credit or have laboratory privileges and may not submit papers for grades and correction. Audited credit is not included in the computation of the study load for full-time, part-time determination or for overload status. At the instructor's discretion, an auditor not maintaining satisfactory attendance in class may be issued a "W" grade at the end of the semester. A person who has audited a class may not request credit via departmental (local) exams until the subsequent academic year.

Change of Grade Policy

Grades, other than incompletes and deferreds, submitted by the instructor upon completion of a course, are assumed to be the student's final grades and they become part of the student's permanent records. A grade may not be changed unless a legitimate error has been made on the part of the instructor in calculating the grade and such a change must be approved by the instructor's unit head and dean. Corrections of grading errors must be made within 30 days after the beginning of the next regular semester.

Class Standing

Class standing is determined on the basis of total credits earned. Students are classified as:

Freshman	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 transfer credits accepted by UAF. Special students are registered without class standing (WCS). Graduate students are given the class standing of "graduate" only after being officially admitted to master's or doctoral programs.

Credit by Examination

The credit by examination program is administered by the Department of Institutional Studies and Testing in the Office of Admissions and Records at the university. Credit by examination is available through the College Level Examination Program (CLEP) and through locally arranged examinations. All exams may be repeated after an interval of one year. Grades from credit by examination are not computed in the G.P.A. In addition, credit by examination is not considered as UAF residence credit.

I. College Level Examination Program (CLEP)

A. CLEP General Examination

1. Only students currently enrolled at UAF or those students who have previously completed credit courses as part of a degree program at the university may be awarded credit.

2. Credit for CLEP General Examinations shall be awarded according to the following schedule:

English — No credit for any score
Mathematics — Three mathematics elective credits for 500 score
Natural Science — Six natural science elective credits for 500 score
Humanities — Six humanities elective credits for 500 score
Social Science/History — Six social science elective credits for 500 score
Maximum number of credits possible — 21

3. If as many as six semester credits have been earned in an area covered by a CLEP General Exam, no credit will be awarded for the successful completion of that exam.

B. CLEP Subject Examinations

1. Only students currently registered at UAF or those students who have previously completed credit courses as part of a degree program at the university may be awarded credit.

2. A course challenged for credit must not duplicate a course for which credit has already been granted or for which a student is currently enrolled.

3. Minimum passing scores of approved CLEP Subject Exams shall be 50. In the case of an essay, the appropriate department shall determine a grade based on the CLEP score plus the essay.

4. A person who has audited a class may not request credit by examination for that class until the subsequent year.

II. Credit by Examination Through Local Exams

A. Only students currently registered at UAF will be awarded credit.

B. Subject to departmental approval, all courses, except -90's (193, 292, 497, etc.) and practicums, may be taken by examination. A list of courses not available for credit by examination is available in the Testing Office.

C. A course challenged for credit must not duplicate a course for which credit has already been granted or for which a student is currently enrolled.

D. A person who has audited a class may not request credit by examination for that class until the subsequent year.

E. As part of the application process, the instructor and the student will mutually agree upon the topics to be covered, type and date of examination and the method of grading.

F. Examinations must be completed within 90 days of the application date. A student not meeting this deadline must reapply and pay an additional fee.

G. The credit by examination fee is not refundable.

Credit-No-Credit Option

The Credit-No-Credit option encourages students to explore areas of interest not necessarily related to their academic majors.

One "free" elective may be taken under this option each semester. The instructor will not be informed of the student's status in the course. The student will be given credit toward graduation if he/she performs at a "C" level or above. If performance falls below that level, the course will not be recorded on the student's transcript. In either case, the course will not be included in any GPA calculations. If the student later changes his/her major and the course becomes a requirement, the course will be accepted by the new major department. The student may change from credit-no-credit status during the first two weeks of the semester by informing the Director of Admissions and Records of his/her desire to change status.

Drop/Add

A student is expected to complete the courses in which he/she is enrolled. The student, however, may withdraw from a course until the end of the ninth week of the semester by following the Drop/Add procedure. After that time, student initiated withdrawals from individual courses will not be accepted. Students wishing to add courses to their schedules may do so until the end of late registration by following the Drop/Add procedure. Information about the procedure and forms may be obtained from the Office of Admissions and Records.

Full-, Part-time Status/Study Load

An undergradute student who registers for 12 or more semester credits at UAF is classified as a full-time student; a graduate student registered for 9 or more credits at UAF is considered as full-time. In order to complete an undergraduate program in four years, a student will have to carry 16 or 17 credits each semester. One may enroll in up to 18 credits per semester without special permission. For enrollment in 19 or 20 credits, the approval of the dean of the college in which the student is majoring must be obtained. For enrollment in 21 or more credits in any one semester, the student must submit a petition for approval to the Vice Chancellor for Academic Affairs.

Credits carried at any unit of UAF are considered in the determination of study load hours and for full-time or part-time classification. Courses that are audited, carried by correspondence or carried through the Tanana Valley Community College are not included in the study load computation.

Grade Point Average (GPA) Computation/Grading System

For the computation of a GPA, the number of UAF credits attempted is divided into the number of grade points earned. To determine the number of grade points earned, the credits attempted for each semester are multiplied by a grade point factor

based on the grades awarded. Credits attempted where grades of AU (audit), CR (credit), DF (deferred), I (incomplete), P (pass), S (satisfactory) or W (withdrawn) have been awarded are not included in the GPA computation. In addition, noncredit courses, transfer credits and credit by examination do not affect the GPA calculations. Undergraduate work is not included in the GPA for graduate students. When one completes a bachelor's degree, the GPA in future work is calculated only on the credits and grades earned since the bachelor's degree was awarded. An exception to this is made if the student is officially admitted to a second bachelor's degree program.

All grades (original and retakes) for a course completed at UAF will be shown on the permanent record but only the last grade achieved at UAF for a course will be computed in the GPA unless the course is designated as one that can be repeated for credit. For scholastic standing calculations for graduate students, the GPA includes all courses identified on the student's advancement to candidacy form (including repeats). For those graduate students who have not been advanced to candidacy, the GPA includes all courses (including repeats) taken since admission to graduate study.

Grades in all courses are letter grades unless specified in the class schedule. The method of grading (letter or pass/fail) is an integral part of the course structure and is included in the course description. It is the same for all students taking the course. Grades appearing on academic records are as follows with grade point factors in parenthesis:

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 (four grade points per credit).

B Indicates outstanding ability above the average level of performance (three grade points per credit).

C Indicates a satisfactory or average level of performance (two grade points per credit).

D The lowest passing grade, indicates work of below average quality and performance (one grade point per credit).

F Indicates failure (no grade points). All "F" grades, including those earned in pass/fail courses, are included in the GPA calculations.

P **Pass** — Indicates passing work and carries no grade points.

S **Satisfactory** — Indicates satisfactory completion and is used only for graduate theses.

DF **Deferred** — Indicates that the course requirements cannot be completed by the end of the semester, that credit may be withheld without penalty until the course requirements are met within an approved time. This designation will be used for such courses as theses, special projects, etc., that require more than one semester to complete.

AU **Audit** — A registration status indicating that the student has enrolled for informational instruction only (no academic credit).

W **Withdrawn** — Indicates withdrawal from a course after the first two weeks of a semester.

Cr Indicates credit was given under the credit-no-credit option.

I **Incomplete** — A temporary grade used to indicate that the student has satisfactorily completed (C or better) the majority of the work in a course, but for personal reasons beyond the student's control has not been able to complete the course during the regular semester. Normally, an incomplete is assigned when the student is in the class until at least the last three weeks of the semester or summer session. Negligence or indifference are not acceptable reasons for an "I" grade.

An incomplete must be made up within one year or it will automatically be changed to an "F" grade. The "I" grade is not computed in the student's GPA until it has been changed to a regular letter grade by the instructor or until one year has elapsed at which time it will be computed as an "F." A senior cannot graduate with an "I" grade in either a UAF or major course requirement. To determine a senior's GPA at graduation, an "I" grade will be computed as a failing grade.

(See also "Course Credit," page 133.)

Honors Lists — Undergraduate Students

The Dean's List — To be eligible for the Dean's List, a student must be an undergraduate enrolled in at least 12 UAF credits graded with letter grades and must have earned a minimum GPA of 3.5 for the semester in UAF courses.

The Chancellor's List — To be eligible for the Chancellor's List, a student must be an undergraduate enrolled in at least 12 UAF credits graded with letter grades and must have earned a GPA of 4.00 in UAF courses.

Majors — Undergraduate Students

A qualified undergraduate student may declare a major when he/she is officially admitted to UAF. Any regular student who does not follow a curriculum leading to a specific degree will be enrolled with an "undeclared" major. A student with an interest in a particular school or college, but who has not selected a major, will be enrolled as a non-major within that division. Special students are not eligible to declare a major or be assigned class standing.

A student may change a major only at the beginning of a semester. A Change of Department and/or Major form, which may be obtained at the Office of the Director of Admissions and Records, must be completed and the student must obtain the written consent of the heads of the departments concerned.

Majors — Graduate Students

No one may have graduate standing without being formally admitted to a specific major or accepted in an approved interdisciplinary program. Declaration of major is made at the time the graduate application for admission is accepted.

If a graduate student wishes to change the area of emphasis of his/her degree program, he/she must secure approval by completing a "Graduate Change of Major and/or Degree Program" form. If a graduate student wishes to change to a different program in another department, division, school or college, he/she must submit a new graduate application for admission so that the applicant's credentials may be fully reviewed by the faculty responsible for that degree program.

Registration

Persons enrolling at UAF must complete registration according to the prescribed procedure and must pay required UAF fees in order to be eligible to attend classes and earn credit. A registration period is held at the beginning of each regular session on dates published in the official university calendar. Registration

for special programs, short courses, seminars, and other classes that are not part of the regular academic calendar will be arranged prior to their starting. (See also "Registration Requirements for Graduate Students," page 21.)

Registration Drop Policy

A student is expected to begin attending classes on the first day of instruction. In order to identify potentially available spaces in courses which have reached enrollment limits, departments may require that a student attend the first class session or notify the department in advance that he/she is unable to attend the first class. If the student misses the first class without notifying the department, the student may be dropped from the course and the space assigned to a student on the waiting list.

A department wishing to use this option, will notify the Office of Admissions and Records at the time the class schedule is prepared so that appropriate notice can be included in the schedule. After the first class session, lists of the names of the students who are to be dropped from classes will be forwarded by the department head to the Office of Admissions and Records so the course can be removed from the students' enrollment files as soon as possible.

Should space become available in a class from which a student has been dropped by the department, the student will have to complete the regular drop/add procedure to add the course.

Reserving Courses for Graduate Programs

A senior student at UAF who has only a few remaining requirements for his/her bachelor's degree may take courses at the upper division or graduate level and have them reserved for an advanced degree. To do this, a student must be in his/her final year of an undergraduate program and must submit a written petition during the first four weeks of the semester identifying which courses being taken that semester are to be reserved for graduate study and are not to be counted toward the bachelor's degree. (Reserving these courses, however, does not assure that they will be accepted by a graduate advisory committee as part of the student's eventual graduate program.)

Scholastic Progress

Midterm grade reports are required for all freshmen with a grade of less than C. It is the instructor's responsibility to assure that all students are aware of the grading policy for their course and that homework, exams, etc. are returned in a timely manner so that students know their class performance.

Scholastic Standards Undergraduate Students

UAF has set scholastic standards so undergraduate students earning less than satisfactory grades will examine their objectives carefully before continuing. The scholastic standards are designed so that action is taken before a student's record deteriorates to the point that readmission to UAF or to another college or university becomes a problem. In all cases involving poor scholarship, students are encouraged to consult with their advisers, instructors or deans.

At the end of a semester, an undergraduate student failing to earn a GPA of 2.00 in courses at UAF will be subject to scholastic action. Depending upon the circumstances, scholastic action may result in a student being placed on probation, continued on probation or disqualified from the university.

Probation — A student in good standing who earns a semester GPA of less than 2.00 will be placed on probation. A student previously on probation whose semester and/or cumulative GPA is less than 2.00 may be continued on probation if circumstances warrant. The probation determination, which is made by the dean of the college in which the student is majoring, may include conditions and/or credit limitations which the student is expected to fulfill during his/her next enrollment at UAF. In order to be removed from probation, a student's cumulative and semester GPAs must be 2.00 or higher.

Academic Disqualification — If a student's cumulative record indicates poor scholarship, the dean of the college in which the student is majoring may recommend that the student be disqualified from UAF. A student who is academically disqualified is not permitted to enroll in credit courses at UAF for the next regular semester following disqualification. After one regular semester, a student may enroll at UAF as a special student, limited to six credits or less per semester for any remainder of the disqualification period. A student under academic disqualification must reapply for admission to UAF when he/she wishes to be considered for readmission as a regular student. The application for readmission should include evidence that the student now has a high probability for success in college.

Good Standing — To be in good standing, an undergraduate student must maintain both a cumulative and a semester GPA of 2.00 or better in UAF courses.

Scholastic Standards Graduate Students

A graduate student will be permitted to continue graduate study from semester to semester only if his/her performance is satisfactory as judged by the student's advisory committee and dean. Minimally, a cumulative grade point average of 3.00 (B) in the courses identified on his/her advancement to candidacy form is required for good standing. For those students who have not been advanced to candidacy, a minimum cumulative grade point average of 3.00 is required in all courses taken since admission to graduate study.

Upon the recommendation of either the dean or the student's advisory committee, a student may be disqualified from graduate study when his/her performance is deemed unsatisfactory.

Veterans' Training

The university is approved for veterans' training by the Veterans' Administration (VA). UAF will be held responsible for overpayments made to students receiving VA educational benefits when such overpayments result from excessive absences, discontinuance or interruption of courses by veterans, or by a veteran not meeting the academic standards of progress of the university. Therefore, UAF instructors will notify the Veterans' coordinator when a veteran is not attending or irregularly attending class or is not meeting the minimum UAF academic standards in their classes.

In compliance with VA requirements, UAF will report to the VA any veteran receiving VA educational benefits who is not maintaining a semester or cumulative GPA of 2.00 or above (3.00 for a veteran in graduate studies). Failure to maintain the required GPA may result in the suspension of VA benefits.

UAF does not have a Veterans' Affairs Office on campus. However, a counselor visits the campus regularly during the year. Veterans interested in further information about educational benefits should contact the Office of Admissions and Records.

Withdrawal

After the end of the ninth week of the semester, withdrawals from individual courses will not be accepted.

Total withdrawal from UAF must be initiated by the dean of the college/school in which the student is majoring. The Dean of Students must initiate the withdrawal for non-majors.

The dean initiating the withdrawal will immediately notify the course instructors and the student's adviser of the withdrawal.

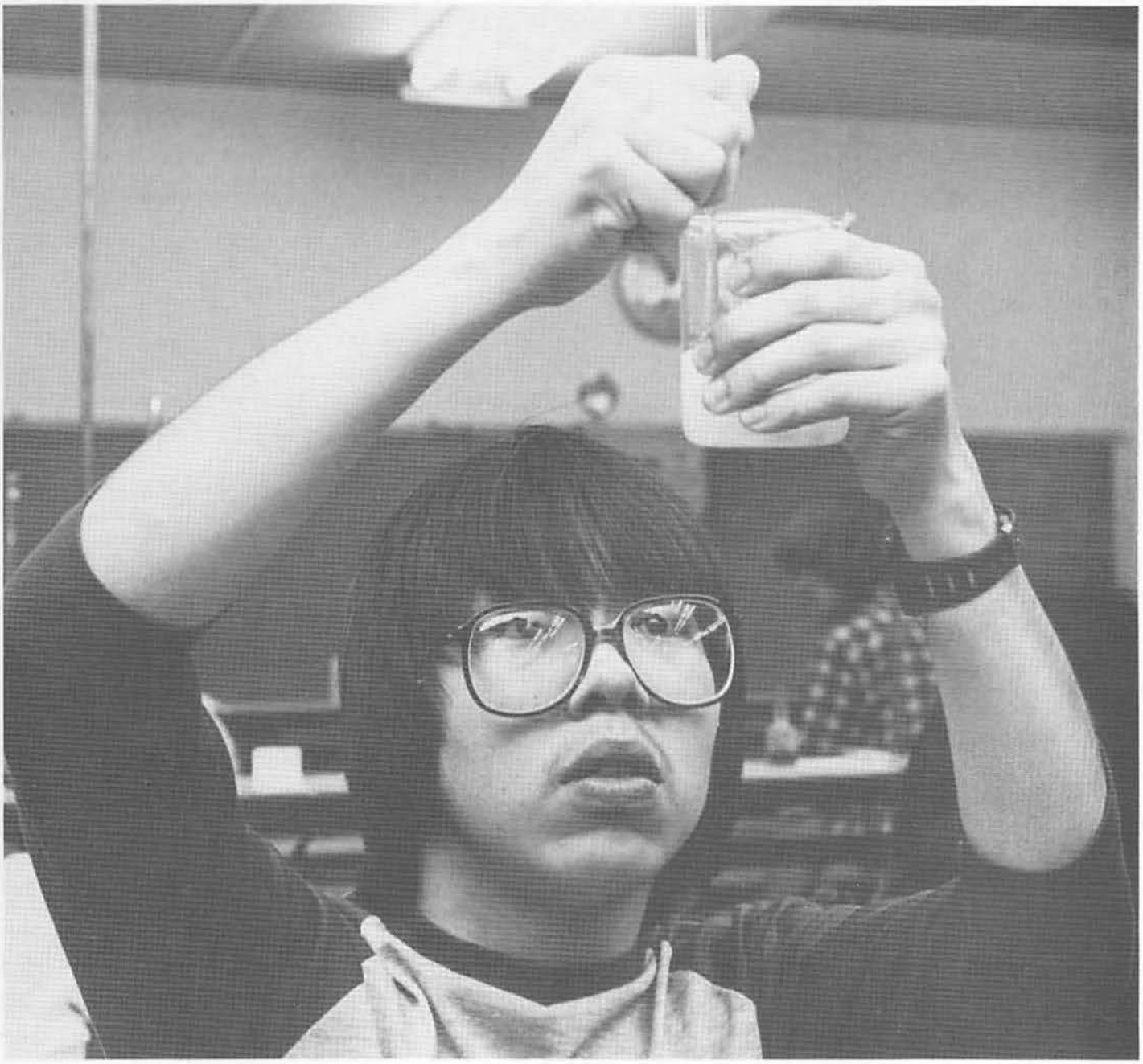
Withdrawal from UAF is the official discontinuance of attendance prior to the end of the semester or session.

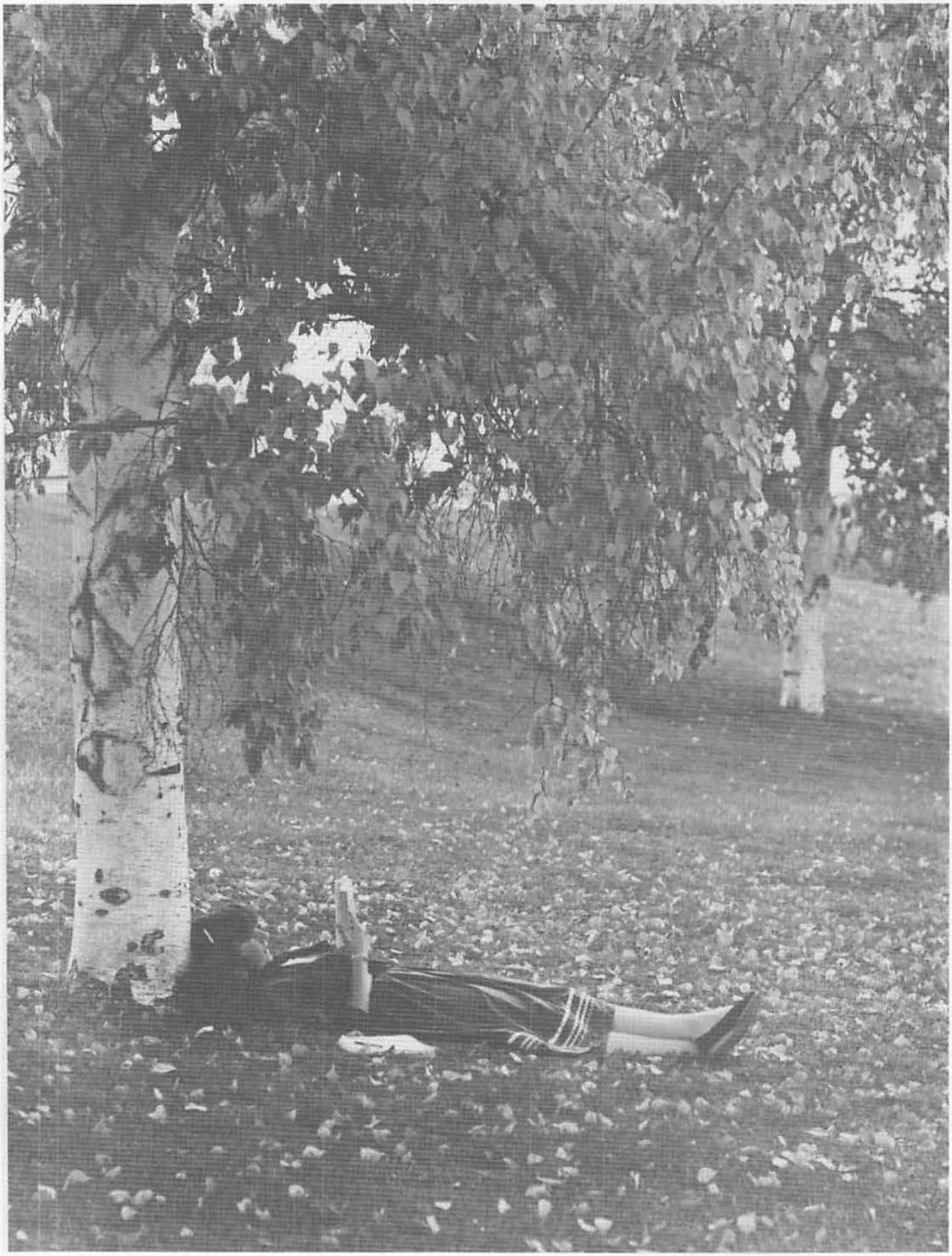
Withdrawals after the second week, regardless of the type, will appear on the student's permanent record as the letter "W" but will have no effect on the student's GPA nor any reference to the student's standing in the class.

All withdrawals must be acknowledged by the student in writing.

The above withdrawal policy deadline will be adjusted for courses shorter in time than the regular semester.

The appeals route for students or faculty regarding the dean's decision is the Chancellor, and then the Fairbanks Grievance Council.





Degree Requirements

To receive a degree from the University of Alaska-Fairbanks, a student must satisfy three sets of requirements: general university requirements, degree requirements, and program (major) requirements. General university requirements and degree requirements are described in this section of the catalog; requirements of the major are given in the Degree Programs section.

General University Requirements

Undergraduate — The minimum number of credits which must be earned, including those accepted by transfer, is 120 semester hours for a bachelor's degree. A minimum of 42 upper-division credits is required for any bachelor's degree awarded at UAF.

For a bachelor's degree a student must earn in residence at UAF at least 24 credits in upper-division courses and at least 30 of the last 36 credits for the degree. Transfer students will ordinarily be required to earn at UAF a minimum of 12 semester credits in each major field and a minimum of three semester credits in each minor field. Credit by examination does not qualify for residence credit.

A minimum GPA of 2.00 (C) must be attained in all work as well as in the major and minor fields. In addition, a minimum grade of C must be earned in the courses required for the major.

A student enrolled in an undergraduate degree program may elect to graduate under the requirements of the UAF catalog in effect during the year of graduation or in effect at the time he/she originally enrolled in the major, providing there has not been a time lapse of more than seven years. Only one catalog can be used for each degree.

Certification that the major (and minor, if any) requirements have been met is the responsibility of the faculty of the student's department or program. Department/program heads will indicate such certification in writing to the Director of Admissions and Records.

Graduate — A graduate student must have applied and been admitted to a specific degree program and, in addition, must later be admitted to candidacy for that degree and discipline major.

All graduate students must register for a minimum of 3 credits or extend registration each semester (excluding summer semester) in which he/she is actively working toward a degree.

Only graduate students who are actively working toward a degree but are not in residence and do not use university facilities may "extend registration."

Credits earned while a special student or a student without class standing may be applied toward a graduate degree only with approval of the student's advisory committee to a maximum of 1/2 of all credits used to meet the degree requirements.

Credit by correspondence or examination or courses taken under the credit-no credit option may not be used in fulfilling the basic course requirements of the degree program.

A cumulative GPA of 3.00 (B) is required for good standing. An "A" or "B" grade must be earned in courses not primarily for graduate students (300 or 400); "C" will be accepted in graduate courses (500 or 600), provided the student maintains a "B" average both for all graduate courses and for 600-level courses. For the purposes of graduate study (good standing and meeting degree requirements), all grades, including those generated from retaking a course, will be included in the GPA.

A graduate student must satisfactorily pass a final examination(s) according to the requirements for his/her degree.

Additional requirements and specific details concerning graduate degrees will be found in the *Manual of Information and Procedures for Graduate Studies*. Copies can be obtained from the Office of Graduate Studies.

Residence Credit

Residence credit is defined as UAF credit that is earned by a student in formal classroom instruction or in individual study or research through any unit of UAF. Transfer credit, advanced placement credit, formal service school credit, military service credit and credit granted through nationally prepared examinations are not considered residence credit. Credit by examination earned through locally prepared tests is not normally considered residence credit.

Degree Requirements Undergraduate

A maximum of 32 semester hours of work completed by correspondence may be accepted toward a bachelor's degree. Students wishing to use credits from correspondence courses toward degree requirements must obtain approval of courses by the dean of the school or college from which they expect to graduate. Students not receiving prior approval for such courses take the risk of not having the courses accepted.

Since English 211, 213, 311, and 312 are primarily courses in writing, and interchangeable, any one of them will satisfy the second half of the requirement in written communication for the bachelor's degree. A student who has taken one of these courses before declaring a major in which one of the other courses may be considered more appropriate, or a student who changes his/her major from a field in which one of these courses is considered more appropriate than the others, will not be required to take the other course.

A UAF graduate wishing to obtain a second bachelor's degree must complete a minimum of 24 hours of credit beyond the first bachelor's degree. All general university requirements, degree requirements, and requirements of the major must be met for both degrees.

A student who holds a bachelor's degree from a college or university other than UAF must apply for admission as a transfer student. All general university requirements, including residency requirements, degree requirements, and requirements of the major must be met.

Bachelor of Arts Requirements

Communication:	*Credits*
English 111 or equivalent, and English 211, 213, 311, 312 or equivalent	6

Speech Communication 3

Humanities:
Any combination of courses at the 100 level or above, selected from at least 3 disciplines, with a maximum of 9 credits from any one discipline 18

Social Sciences:
Any combination of courses at the 100 level or above, selected from at least 3 disciplines, with a maximum of 9 credits from any one discipline 18

Mathematics and Logic:
Any combination of courses at the 100 level or above from the Department of Mathematical Sciences (Mathematics, Computer Science and Applied Statistics), or Philosophy 204 6

Natural Sciences:
Any combination of courses at the 100 level or above which includes at least one laboratory course 7

Major Complex* ..... At least 30**

Minor Complex* ..... At least 12**

Minimum credits required for degree 120***

Of the above, at least 48 credits must be obtained in the upper division (300 level or higher) courses.

*Courses specified by a major or minor complex which are not in the primary discipline of that complex may be used to fulfill the Humanities, Social Sciences, Mathematics and Logic, or Natural Sciences distribution requirements.

**Departmental requirements for majors and minors may exceed the minimums indicated. Specific requirements are listed in the Degree Programs section of this catalog.

***Most degree programs require 130 credits. See specific requirements listed in Degree Programs section of this catalog.

Majors Available for B.A. Degree: Alaska Native Studies, Anthropology, Applied Linguistics, Art, Biological Sciences, Chemistry, Earth Sciences, Economics, English, Eskimo, Foreign Language, Geography, Geography and Regional Development, History, Humanities, Human Services, Interdisciplinary Studies, Journalism, Justice, Linguistics, Mathematics, Music, Northern Studies, Philosophy, Physical Education, Physics, Political Science, Psychology, Rural Development, Russian Studies, Social Work, Sociology, Speech Communications, Theater.

(Requirements of majors are listed in the Degree Programs section of this catalog.)

Minors Available for B.A. Degree: Accounting, Alaska Native Languages, Alaska Native Studies, Applied Linguistics, Athletic Coaching, Computer Information Systems, Computer Science, Anthropology, Art, Asian Studies, Biological Sciences, Business Administration, Chemistry, Economics, Secondary Education, Elementary Education, English, Eskimo, French, Geography, Geology, German, History, Humanities, Human Services, Journalism, Justice, Linguistics, Mathematics, Military Science, Music, Philosophy, Physics, Physical Education, Political Science, Psychology, Russian, Russian Studies, Sociology, Spanish, Speech Communications, Statistics, Theater, Travel Industry Management.

The following associate degree programs are approved as minors for the bachelor of arts degree: Air Traffic Control, Business Administration, Chemical Science, Early Childhood Development, Electronics Technology, Fire Science, Food Technology, Justice, Library Technical Assistant, Petroleum Technology, Office Occupations, Paraprofessional Counseling, and Professional Piloting.

Double Major — A Bachelor of Arts degree candidate may complete two majors rather than a major and a minor. The majors must be selected from those approved for the Bachelor of Arts degree and all general requirements plus all requirements for both majors must be completed. If one major is from a program where 120 total credits are required and the other major is from a program where 130 credits are required, the student will be expected to complete 130 credits. The student completing a double major must officially declare both majors either at the time of admission and/or through the change of major procedure. The student will be expect to follow the degree requirements as listed in the catalog in effect at the time the first major is officially declared or from the catalog in effect the year of graduation.

Double Degrees — A student wishing to complete more than one bachelor's degree at UAF must complete all general requirements as well as all major, and minor, if any, requirements for all degrees. A minimum of 24 semester hours of credit beyond the total required for the first degree must be earned before any additional degrees can be awarded. The student may use the catalogs in effect at the time majors are officially declared or the catalogs in effect at the time of graduation. In other words, for two degrees that are completed at the same time, a student may be following requirements from two different catalogs.

Bachelor of Science Requirements *Credits*

Communications
English 111 or equivalent and
English 211, 213, 311, or 312 6
Speech Communication 3

Mathematics
One semester of college-level Calculus, Math. 203, or Applied Statistics 301 ..... 3 or more

Natural Science
Chemistry, Biology, Geoscience (Solid Earth Sciences), or Physics (minimum of 6 credits each in two disciplines), including 2 credits of laboratory 16

Social Science/Humanities
Social Science (minimum of 3 credits) and Humanities (minimum of 3 credits), exclusive of 9-credit communications requirement 15

Major Complex (see departmental curricula for specific requirements and for Minor Complex, if required)* ..... variable

Minimum credits required for degrees 120**

**Most degree programs require 130 or more credits. See specific requirements listed in Degree Programs sections of the catalog.

Majors Available for B.S. Degree: Anthropology, Applied Physics, Applied Statistics, Biological Sciences, Chemistry, Civil Engineering, Computer Science, Electrical Engineering, Fisheries Science, General Science, Geography, Geology, Geological Engineering, Interdisciplinary Studies, Mathematics, Mechanical Engineering, Mining Engineering, Natural Resources Management, Petroleum Engineering, Physics, Physical Education, Psychology, Sociology, Wildlife Management.

(Requirements of majors listed in the Degree Programs section of this catalog.)

Double Major — A Bachelor of Science degree candidate may complete a double major instead of a single major. The majors must be selected from those approved for the Bachelor of Science degree and all general requirements plus all requirements for both majors must be completed. The student completing a double major must officially declare both majors either at the time of admission and/or through the change of major procedure. The student will be expected to follow the degree requirements as listed in the catalog in effect at the time the first major is officially declared or from the catalog in effect the year of graduation.

Bachelor of Technology Requirements *Credits*

*Must have completed an associate degree in a technical specialty (Associate of Technology, Associate of Applied Science). Students holding associate degrees of less technical depth (Associate of Arts) must make up the equivalent technical deficiencies before being admitted to the Bachelor of Technology degree program ..... 60 or more

Communication (may have been taken as part of the associate degree):
Engl. 111 and Engl. 211, 213, 311, or 312 6
Oral Communication 3

General Education (courses taken as part of the associate program are acceptable):

12 credits in one area, 6 credits in a second area and 3 credits in each of the two other areas: Social Sciences, Humanities, Natural Science, Mathematical Science (Mathematics, Computer Science, Statistics) 24

Major Complex (must be beyond associate degree major, 30 credits):
Upper-division credits in technical specialty 0-12
Complementary area 24-30
Minimum credits required for degree 130

A minimum of 65 credits must be earned beyond those applied to the associate degree. Twenty-four upper division credits must be earned at UAF. All credits must be 100-level or above.

*Major Complex Available for the B.T. Degree: Education.

The following technical specialties have been approved as acceptable associate degree programs for admission to the Bachelor of Technology degree program in Education:

Aviation Technology
Electronics Technology
Food Service Technology

Bachelor of Business Administration Requirements

Communications	*Credits*
Engl. 111	3
Engl. 211, 213, 311 or 312	3
Sp.C. Elective	3
Social Science	
Psy. 101 — Intro. to Psychology *or*	
Soc. 101 — Intro. to Sociology	3
P.S. 101 or 102 — Intro. to American Government	3
Econ. 201 and 202	6
History elective	3
Social Science elective	3
Natural Science & Mathematics	
Natural Science elective (including 1 cr. of lab)	4
Math. 161 and 162	7
Humanities	
Humanities elective	6
(In addition to 3 credits of speech elective taken under "Communications" above)	
Major Complex and Common Body of Knowledge	
See department curricula for specific requirements.	
Minimum Credits Required for Degree	120**

**Most degree programs require 130 credits. See specific requirements listed in Degree Programs section of the catalog.

Majors Available for B.B.A. Degree: Accounting, Economics, Business Administration (Finance, International Business, Management, Marketing, Travel Industry Management).

(Requirements of majors are listed in the Degree Programs section of this catalog.)

Bachelor of Education Requirements
See under Education in Degree Programs section.

Bachelor of Music Requirements
See under Music in Degree Programs section.

Bachelor of Fine Arts Requirements
B.F.A. general requirements are the same as the requirements for the B.A. (See page 29.)
Major Available for B.F.A. Degree: Art.

Course Classification

Courses that may be used in satisfying generally stated degree requirements (e.g., "Social Science elective") are classified in the course listings by the following designators: s-Social Sciences; n-Natural Sciences; and h-Humanities. For instance, Hist. 341, History of Alaska (3+0)s may be utilized to satisfy the "Social Science elective" requirement.

Academic Petition

Any deviation from academic requirements and regulations must be approved by academic petition. A petition form, which requires the signatures of the student's adviser, unit head, and dean, may be obtained from the Office of the Director of Admissions and Records.

Petitions to waive general university or degree requirements must be approved by the Vice Chancellor for Academic Affairs.

Degree Requirements — Graduate

Specific requirements and procedures for graduate study are listed below and in the *Manual of Information and Procedures for Graduate Studies*, which can be obtained from the Office of Graduate Studies.

Master's Degree

The minimum number of credits which must be earned for every master's degrees is 30 semester hours.

A maximum of 12 credits may be devoted to thesis or to thesis and research, or a maximum of 6 to research in non-thesis degrees. At least 24 credits in any master's program, including thesis and research, must be at the 600 level.

A maximum of 9 semester hours of credit from another institution may be transferred to UAF and applied toward a master's degree upon approval of the student's advisory committee and the dean of the college or school in which the student is enrolled.

A student may apply for admission to candidacy for a specific master's degree if he/she is in good standing and has satisfied the following requirements: the student must have (1) satisfactorily completed at least eight credits of graduate study at UAF; (2) received approval for the provisional thesis title if a thesis is required, and (3) received approval of the finalized Graduate Study Plan.

The candidate must pass a comprehensive/final examination, either written or oral; if a thesis is required, an oral defense of the thesis must be taken either in conjunction with or in addition to, the comprehensive/final examination. The examining committee shall consist of at least a candidate's advisory committee and, in the case of an oral exam, an examiner from outside the candidate's college, school or division, representing the Office of the Chancellor.

All work toward the fulfillment of the requirements of a master's degree must be completed within seven years. All courses listed on the student's program must be satisfactorily completed.

Master of Arts in Teaching

The master of arts in teaching program is designed to serve baccalaureate graduates who qualify for the Alaska secondary school certificate, who intend to make secondary school classroom teaching their career and who wish to take additional work in their teaching major and/or minor as well as in Education.
NOTE: Students will enroll in a department or program which offers an approved M.A.T. program. See "Approved Programs" below.

Admission Requirements:

1. A bachelor's degree and a teaching credential.
2. A grade point average of at least 3.00 in the baccalaureate major, teaching major, and in education courses.
3. Submission of the following to the Director of Admissions and Records:

a. A completed university Application of Admission to Graduate Study.
b. A statement of goals to which the M.A.T. will contribute.
c. Official transcripts of all previous college or university work.
d. At least three letters of reference.

4. Additional evaluative material may be required by some departments: e.g.,

a. Scores from the aptitude test of the Graduate Record Examination and/or scores from the advanced tests in the field of the baccalaureate major.
b. An interview.

5. Recommendation for admission by the dean of the college or school in which the subject matter discipline is located.

Degree Requirements:

1. Complete general university requirements and master's degree requirements, pages 29 and 31.
2. Complete 36 credits, of which at least 24 credits, including research, must be at the 600 level.

Required Courses:	*Credits*
Ed. 601—Critique of Educational Research Methods	3
Ed. 612—Cultural and Phil. Foundations of Education	3

Other required courses to be specified by student's graduate committee and may vary depending on the particular field of study. Some departments may have additional requirements.
3. Each candidate must pass a written comprehensive examination. The examining committee shall consist of the student's advisory committee. There is no thesis requirement for the M.A.T. degree.

Approved Programs:

The M.A.T. degree at UAF has been approved for the following subject matter areas: biology, chemistry, English, geosciences, history, mathematics, music and physics. Students wishing to study toward the M.A.T. degree in areas not previously approved may apply for admission under the University's interdisciplinary (individual attention) program.

Educational Specialist Degree

The minimum number of credits which must be earned beyond the master's degree is 36 semester hours, 30 of which must be 600 level.

A maximum of 9 hours of credit may be accepted by transfer, with approval of the student's graduate committee and the Dean of the College of Human and Rural Development.

The student may apply for advancement to candidacy, provided he/she is in good standing and has (1) satisfactorily completed a minimum of nine credits of his/her program at UAF and (2) received approval of the finalized Graduate Study Plan.

The student must complete a 6-credit-hour internship or field study and must pass a written and oral comprehensive examination.

All work toward the fulfillment of the requirements for the educational specialist degree must be completed within seven years after first registering for the program.

BACCALAUREATE DEGREE REQUIREMENTS IN BRIEF

ACADEMIC DISCIPLINE	Bachelor of Arts	Bachelor of Science	Bachelor of Bus. Admin.	Bachelor of Education	Bachelor of Music	Bachelor of Technology	ACADEMIC DISCIPLINE
Written Communication	Engl 111 - 3 cr Engl 211, 213, or 311 - 3 cr	Engl 111 - 3 cr Engl 211, 213, or 311 - 3 cr	Engl 111 - 3 cr Engl 211, 213, or 311 - 3 cr	Engl 111 - 3 cr Engl 211, 213, or 311 - 3 cr	Engl 111 - 3 cr Engl 211, 213, or 311 - 3 cr	Engl 111 - 3 cr Engl 211, 212, 213, or 311 - 3 cr	Written Communication
Oral Communication	Sp.C. elective - 3 cr	Sp.C. elective - 3 cr	Sp.C. elective - 3 cr	Sp.C. elective - 3 cr	Sp.C. elective - 3 cr	Sp.C. elective - 3 cr	Oral Communication
Humanities	18 credits in any combination of courses at the 100 level or above selected from at least 3 disciplines with a maximum of 9 credits from any one discipline in both humanities and social science areas - 36 cr	15 credits including at least 3 credits from each area	Electives - 6 cr	Electives - 9 cr Ling. 101 or ANL 215 or 216 - 3 cr	Non-Music elect - 15 cr		Humanities
Social Science			History - 3 cr Psy 101 or Soc 101 - 3 cr P.S. 101 or 102 - 3 cr Econ 201, 202 - 6 cr Electives - 3 cr	Anth. 242 - 3 cr Hist. 131 or 132 - 3 cr Hist. Elect. - 3 cr P.S. 101 - 3 cr P.S. 263 or ANS 310 - 3 cr Psy 101 - 3 cr Psy 240 - 3 cr Elective - 3 cr	Electives - 15 cr (Psy 101 - 3 cr required for Mus. Educ.)	Gen. Educ. - 24 cr (12 cr in one area, 6 cr in 2nd area, and 3 cr in each of other two areas) Courses taken as part of associate program are accepted.	Social Science
Natural Science	Any combination of courses at the 100 level or above which includes one lab course - 7 cr	Chem, Biol, Geol, or Physics - 16 cr (6 cr in each of 2 disciplines incl. 2 cr of lab)	Nat. Sci - 4 cr (including 1 cr of lab)	Elementary: Math 205 - 3 cr Math Elect. - 6 cr Science Elect. - 7 cr (incl. lab science)			Natural Science
Mathematics	Mathematics and Logic: any combin. of courses at the 100 level or above from the Dept. of Mathematical Sciences (Math, Computer Sci, or Phil. 204) - 6 cr	One semester college level calculus, Math 203 or AS301 - 3 or more cr	Math 161-162 - 7 cr	Secondary: Math Elective - 6 cr Science Elect. - 7 cr (incl. lab science) Math or Science Elective - 3 cr			Mathematics
Other	Of the total credits required for the degree, 48 must be upper-division (300 or 400 level) courses		Common body of knowledge - 33 cr	Required Education and other courses - 42 - 51 cr		65 cr must be earned beyond assoc. degree, including a minimum of 30 cr in major complex.	Other
Major Complex or Specialty	At least 30 credits	Variable	33-42 cr	Elementary concentration - 24 cr or more	Variable		Major Complex or Specialty
Minor Complex	At least 12 credits			Secondary integrated major/minor - 45 - 48 cr			Minor Complex

Doctor of Philosophy Degree

The degree of doctor of philosophy is granted for proven ability and scholarly attainment. There are no fixed credit requirements for this degree at UAF. It is not 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/her advisory committee, such lines of study in related fields as are necessary to achieve a thorough and scholarly knowledge of his/her subject. The committee and the student will prepare the student's graduate study plan 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.

UAF requires completion of a foreign language/research tool requirement set by the candidate's advisory committee. Refer to the *Manual of Information and Procedures for Graduate Studies* for details. The selection and administration of suitable proficiency tests will be under the direction of the graduate committee.

Admission to graduate study does not imply admission to candidacy for a degree. The student should seek admission to candidacy approximately one year before completing the requirements for the doctorate. A student may be accepted as a candidate by the advisory committee after (1) completing the full-time equivalent of two academic years of graduate study, (2) completing at least one semester in residence at UAF, (3) finalizing the graduate study plan, (4) passing the foreign language/research tool requirement, (5) obtaining approval by the advisory committee of the title and synopsis of the thesis, and (6) passing a written comprehensive examination administered on a departmental basis.

The thesis, which is required for the Ph.D. degree, is expected to represent the equivalent of at least one full academic year's work at UAF and must be a substantial contribution to knowledge. All Ph.D. students must complete 18 thesis credits.

After submitting the thesis, the candidate must pass an oral examination supporting the thesis. The examining committee will consist of the student's advisory committee supplemented by additional examiners, including one from outside the candidate's college, school or division, representing the Office of the Chancellor.

All work toward the fulfillment of a doctoral degree must be completed within ten years.

Thesis — At least two copies of the thesis (original and best reproduction, both on thesis paper) must be submitted to the Office of Graduate Studies to be bound and filed in the university library. For further information regarding thesis preparation and submission, see the *Manual of Information and Procedures for Graduate Studies*. All work done and all specimens collected in connection with the preparation of thesis are the property of the university and the agency financing the work. That material which is the property of the university can be released with the permission of the head of the department and the dean after it has been reproduced by the university.

Doctor of Medicine

For further information contact the WAMI Medical Education Program Office, University of Alaska-Fairbanks, Fairbanks, AK 99701.

Registration Requirements for Graduate Students

A graduate student must be registered each semester in which he/she is actively working toward a degree. A student wishing temporarily to suspend studies should obtain an approved leave of absence. A student failing to either register or to obtain a leave of absence will be dropped from graduate study and will be required to reapply for admission and be readmitted before he/she can resume graduate studies.

Extended Registration — A student whose only remaining requirement is the completion of the final examination(s), the removal of a deferred grade from an earlier enrollment, or the completion of a thesis may extend registration by completing the extended registration procedure and paying the appropriate fee during the regular registration period at the beginning of the semester. Upon completion of extended registration, the student is considered enrolled for the current semester. Only graduate students who are actively working toward a degree but are not in residence and do not use university facilities may "extend registration."

Graduation

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

Application for Graduation — Degree candidates must formally apply for graduation. The application for graduation must be filed with the Office of Admissions and Records during the semester the student plans to graduate, and not later than the application filing dates which appear in the UAF academic calendar.

Applications for graduation filed after the deadline date will be processed for graduation the following semester.

Diplomas and Commencement — UAF issues diplomas to degree candidates three times each year: in September following the summer session, in January at the close of the fall semester, and in May at the end of the spring semester.

All students who complete degree requirements during the academic year are invited to participate in the annual commencement ceremony which follows the spring semester.

Graduation with Honors — In order to graduate with honors, an undergraduate student must have earned a cumulative grade point average in all college work attempted at UAF of 3.5 or higher. In addition, a transfer student must have completed 48 semester hours of credit at UAF and the cumulative grade point average in all college work attempted at all other institutions attended combined with the UAF cumulative grade point average must not be less than 3.5.

Students with cumulative grade point averages of 3.5 will be graduated *cum laude*; 3.8, *magna cum laude*; 4.0, *summa cum laude*, provided they meet the requirements stated above.

Deadlines for Graduate Students

(*See also* 1985-86 and 1986-87 Academic Calendars, pages 4 and 5.)

	Summer 1985	Fall 1985	Spring 1986
Advancement to Candidacy forms to Office of Graduate Studies	July 2*	Sept. 5	Jan. 16
Final draft of thesis due chairman of advisory committee	July 8	Oct. 11	Mar. 14
Graduation Application due Admissions and Records Office	July 18	Oct. 15	Feb. 14
Final exam form due to Director of Admissions and Records	Aug. 2	Nov. 15	Apr. 11
Final oral exam form due to Office of Graduate Studies	Aug. 2	Nov. 15	Apr. 11
Thesis due to Office of Graduate Studies	Aug. 2	Nov. 15	Apr. 11
Final written exam form due to Office of Graduate Studies	Aug. 16	Nov. 29	Apr. 25

*For summer 1986 graduation.

FINANCIAL AID
Opinion

Fees and Financial Aid

Tuition

Students enrolled in undergraduate credit courses will be charged $30 per credit for residents and $80 per credit for non-residents to a maximum of 12 undergraduate credits. Students enrolling in graduate credit will be charged $60 per credit for residents and $120 per credit for non-residents to a maximum of nine graduate credits. Maximum charge for any combination of undergraduate and graduate credits will not exceed $540 for residents and $1,080 for non-residents.

In addition to credit charges, non-resident students will be charged a non-resident tuition.

Tuition schedule (per semester):

Total Credit Hours	*Resident Undergraduate*	*Non-resident Undergraduate*	*Resident Graduate*	*Non-resident Graduate*
12 or more	$360	$960	$540	$1080
11	330	880	540	1080
10	300	800	540	1080
0-9	30/cr.	80/cr.	60/cr.	120/cr.

Fee Definitions

Admission Processing Fee — Fee of $20 shall be paid at the time an application for admission is submitted.

Campus Activity Fee — Students carrying three or more credits on campus will be charged $3 per credit hour for each on-campus credit to a maximum of $24. This fee is not refundable.

Recreation-Athletics Program— Those paying the fee are entitled to the use of the Patty Center recreational facilities, and are admitted to university-sponsored athletic events on campus for $1.50 per person for hockey and $1 per person for all other sports.

Associated Students Program— Those paying the fee are entitled to participation in all student-managed social, educational, and governmental activities, including receipt of student paper, movies, student flying program, KSUA (student-owned radio station), scheduled social events, student elections and administration of student government.

Credit by Examination Fee — A fee of $15 shall be charged for each instance of credit by examination. For more than three credits, an additional charge of $1 per credit hour shall be charged.

Graduate Extended Registration Fee — Graduate students extending registration from previous semester must pay the graduate extended registration fee of $60 (see page 34 for details).

Student Health Insurance Fee — All students registered for 12 or more credits or living in university housing must be covered by health insurance. They may buy the Student Health Insurance offered by the university or show evidence of other insurance coverage. There is a two-week period after registration in which students may acquire the necessary documentation to get a waiver from the Center for Health and Counseling, or they will be enrolled and charged for the insurance premium.

The amount of the insurance fee will be quoted at registration. The fee covers participation in a medical plan that covers accidents and sickness.

The Student Health Program is administered by the Director of the Center for Health and Counseling, under the direction of the Dean of Students. Hospital and medical treatment for extensive illness and injuries are provided in Fairbanks, under limits of coverage set forth in the student health insurance plan. Each student will be supplied with a brochure outlining the insurance coverage. Questions pertaining to insurance coverage and claim filing should be directed to the Center for Health and Counseling staff.

A married student may secure additional insurance coverage for spouse and children if desired. Rates for such coverage will be quoted at registration. This additional coverage is for the insurance plan only and does not include services at the Center for Health and Counseling.

In addition to the insurance plan, all students enrolled for nine credits or more must pay a $30 health center fee. This fee covers normal health center charges during the semester, including physician, laboratory and counseling services.

Housing Fees —

Room Deposit — When applying for housing, a $50 reservation damage deposit must be returned to the Housing Office with the completed application.

Room Rent — Room rent, along with all other fees, is due in full at registration (see Payment of Fees).

Meal Ticket — When registering, each residence hall student is required to buy a meal ticket for cafeteria meals. Meal tickets become effective at the evening meal of the first day of upperclass registration for each semester.

For more information see Housing, page 45

Late Placement and Guidance Test Fee — A charge of $5 shall be made for a placement and guidance test taken at a time other than the scheduled time.

Immediate Service Transcript Fee — Official and unofficial transcripts of UAF academic records are prepared without

charge. Normal processing time is one week; however, at the end of a semester or at other times during the year, processing time may be longer.

There are times when a person is in need of a transcript sooner than one can be produced through the regular processing cycle. For a fee of $5, paid at the time the request is made, a transcript will be prepared as soon as possible, but not later than 24 hours after the request is made and the fee paid. For each additional copy of the transcript made from the same request, a $2 fee will be charged. Therefore, when a person needs immediate service for two transcripts, the fee will be $7. All requests for transcripts must be submitted in writing.

Late Registration Fee — Students registering later than the day designated for that purpose shall pay a late registration fee of $15 for the first working day, plus $5 for each succeeding working day to a maximum of $65. This fee is refundable only in the event that all classes for which the student registered are canceled.

Material Use Fees — A material use fee may be charged for certain courses which require the use of special materials, supplies or services.

Music Course Fees — Fees are charged for the following services or facilities: private instruction (per each applied music course), $125 (fee for music major is $65); class instruction (class lesson course), $60 (fee for music major is $30); class instruction (functional piano course), $60 (fee for music major is $30). Music majors carrying less than 12 credits must pay full fees. Full-time music majors (12 credits or more) will not have to pay more than $95 for any combination of the above fees. Practice room use by student not enrolled in one of the above music courses, on a space available basis, is $60.

Parking Fee — A $15 annual fee is charged for on-campus automobile parking.

Program Plan Fee — The Office of the Director of Admissions and Records will provide without charge one plan for a schedule of courses leading to a degree. A second program plan will be provided for a fee of $5.

Residency Information — Definition of Residency — University of Alaska.

Alaska residents, members of the military on active duty and their dependents, as well as students from the Yukon Territory and the Northwest Territories are exempt from a nonresident tuition fee. For purposes of non-resident tuition a resident is any person who has been physically present in Alaska for one year (excepting only vacations or other absence for temporary purposes with *intent* to return) and who declares intention to remain in Alaska indefinitely. However, any person who, within one year, has declared himself/herself to be a resident of another state, voted in another state, or did any act inconsistent with Alaska residence shall be deemed a non-resident for purposes of non-resident tuition. An unemancipated person under the age of 18 who has a parent of guardian who qualifies as an Alaskan resident, as defined above, shall be deemed a resident, and otherwise such unemancipated persons under the age of 18 shall be deemed a non-resident for purposes of non-resident tuition.

This definition of Alaska residency status is solely for the purposes of tuition payment at the University of Alaska-Fairbanks. The requirements of the university may or may not be the same as requirements of other agencies of the state of Alaska.

Persons wishing to apply for resident status should complete the procedure outlined below:

1. Complete an Application for Residency Status form (The form may be obtained from the Office of Admissions and Records, Signers' Hall.)
2. Attach a copy of documentary proof of residency in Alaska for the past 12 months. Records presented in support of residency application cannot be returned. Therefore, it is suggested that photocopies of such records be made to turn in with the application.
3. Return the completed form and the proof to the Office of Admissions and Records prior to the date of registration.

Acceptable Examples of Proof of Residency:

* Photocopies of rent receipts, well-distributed throughout the past year. (Name and location of rental units must be on receipt.)
* Copies of several checks, well-distributed throughout the past year, which were written to local merchants (one per month is acceptable.)
* A statement from an employer, on company stationery, indicating employment in Alaska during the past year.
* Copy of military orders to Alaska, current military I.D., or military dependent I.D.
* Copy of high school transcript which shows attendance in Alaska for the past year.
* University of Alaska-Fairbanks transcript (already on file) which shows attendance for the immediate past school year.
* A statement from a U.S. Postal Service official verifying Alaskan address and receipt of mail at that address over the past 12 months.

Textbooks — Students can expect to pay up to $250 per semester depending on the discipline.

Payment of Fees

At the announced time of registration, each student is expected to pay all charges due for the entire semester. This includes tuition and fees, room rent, meal ticket costs, student activity fees, health fee and deposits. In addition, any charges unpaid at the end of previous semesters are due and payable prior to re-enrollment at the university.

The fees may be charged on VISA or MasterCard credit cards.

Students who live in university residence halls may apply for deferred fees for up to one-half of their room and board costs. All other costs must be paid at registration. Requests for this deferred payment plan should be made in writing prior to the registration process. The Office of Student Affairs accepts such applications. Applications submitted on the date of enrollment will be processed on a time-available basis and students run the risk of delayed registration resulting in late fees as well as closed classes.

Provisions of the deferred payment plan are as follows:

1. All fees other than room and board must be paid in full at registration.
2. A minimum of 50 percent (50%) of room and board costs must be paid at registration.
3. The balance is due in a maximum of two equal monthly payments. These are due 30 and 60 days following the first date of registration as announced by the Director of Admissions and Records.
4. A processing fee of $2 for the initial contract and $2 per payment is added to the amount of the contract.
5. Delinquent payments are subject to an additional $25 per payment.

Financial Obligations

The University of Alaska-Fairbanks reserves the right to withhold transcripts, diplomas or final grade reports from students who have not paid all financial obligations to the institution. If a student is delinquent in payment of any amount due the university, registration for succeeding semesters may be withheld.

Registration of any student may be canceled at any time for failure to meet installment contract payments or financial obligations. The registration process is not completed until all fees and charges due the university have been paid.

Other Fees

Admission Processing Fee	$ 20.00
*Campus Activity Fee	3cr./$9 - Max. $24
Course Fees (See Course Description section)	5.00 - 125.00
Credit by Examination Fee	15.00 exam
Graduate Extended Registration Fee	60.00
*Health Service Fee	30.00/semester
*Health Insurance, student (approximately)	60.00/semester
**Housing Fees:	
Residence Hall, Double Room	500.00/semester
Residence Hall, Single Room	600.00/semester
Student Apartment Complex (each resident)	650.00/semester
Married Student Apartments	230.00-420.00/month
Meal Ticket (approximately)	750.00/semester
Immediate Service Transcript Fee	5.00
Late Placement and Guidance Test Fee	5.00
Late Registration Fee	15.00 - 65.00
Material Use Fee	Variable
Parking Fee	15.00/Annual
Program Plan Fee	5.00

*These fees are dependent upon the number of credit hours in which the student is enrolled. See specific fee description for further information.

**These are the 1984-85 fees and they are subject to change.

Refunds — General University Tuition and Fees

A student who is withdrawing from courses or canceling enrollment must complete an official withdrawal and turn it in at the Office of the Director of Admissions and Records. Refunds will be made according to the following schedule:

Full or partial refund of undergraduate and graduate credit hour fees, and non-resident tuition will be made under the following circumstances.

1. In the event that courses for which the student is registered are canceled by UAF, the above charges will be refunded in full.
2. If the student formally withdraws from a course, refunds will be made according to the following schedule as determined by the date of the formal withdrawal action.
   (a) Full refund — withdrawal prior to first day of instruction for the semester.
   (b) 90 percent refund — withdrawal on or after the first day of instruction but prior to the eighth calendar day thereafter.
   (c) 50 percent refund — withdrawal on or after the eighth calendar day of the semester but prior to the fifteenth calendar day.
   (d) No refund — withdrawal on or after the fifteenth calendar day of the semester.

   For the purposes of this paragraph, "first day of instruction for the semester" is as stated in the official university calendar and is not necessarily the first meeting date of any individual course. Weekends are included in counting days for the partial refund periods.
3. Claim for a refund must be made in writing to the business office at the time of withdrawal. The certified date of withdrawal, as indicated on the official withdrawal slip, will determine the student's eligibility for a refund. Applications for refund may be refused unless they are made during the semester or term in which they apply.
4. Students whose registration is canceled as a result of disciplinary action forfeit all rights to a refund of any portion of their tuition and fees.
5. Vocational/technical course fees shall be subject to this refund schedule.
6. Health service, health insurance premiums, music course, campus activity, laboratory, materials and miscellaneous fees shall not be subject to refund.
7. In case the operations of UAF are adversely affected by war, riot, natural act, action of civil authority, strike or other emergency or condition, the university reserves the right to take action to curtail part or all of its operations, including action to cancel classes and action to discontinue services. In any case in which a significant curtailment is judged proper by UAF, the university's liability shall be limited to (at most) a refund of tuition and fees paid.

Refunds — Housing

Specific procedures followed by UAF in refunding to students payments which they have made for board and room are as follows: "Residents withdrawing from the university or who must vacate their rooms for reasons beyond their control will be charged 10 percent of the semester room payment for each week of occupancy. Board refunds are based upon the number of days remaining in the semester during which the meal ticket will not

be used, less a five-day service charge. Housing deposits are refunded less any valid assessments by the Office of Student Affairs when a person terminates occupancy. Housing deposits will be carried over for students with housing contracts to subsequent academic years."

Financial Aid

The Office of Student Financial Aid exists to provide counseling and financial aid to students in need of assistance. All students are encouraged to seek general financial counseling and help in the personal management of money.

Eligibility for Aid

Most aid is based upon need as determined by a careful analysis of the applicant's budget and resources. UAF utilizes the College Scholarship Service needs analysis system and requires that all undergraduate applicants for financial aid apply for the Pell Grant by completing the "Application for Federal Student Aid."

The financial need of a *dependent* student is calculated on the basis of the student's and the parents' resources.

The financial need of an *independent* student is calculated on the basis of the student's financial resources.

For the purposes of student financial aid, a student is considered to be *independent* from parents if he/she meets all of the following criteria:

For the calendar year prior to the academic year for which he/she is applying for aid, and for the year(s) for which he/she is applying, a student cannot have or plan to have

1. been claimed by his/her parents as a dependent on their income tax return.
2. received financial support in excess of $750 annually from parents.
3. lived with his/her parents for any period exceeding six weeks.

Applicants are required to complete the following forms:

1. University of Alaska-Fairbanks financial aid application.
2. An application for Federal Student Aid. The application form should be submitted to the federal processor; an envelope is provided with the form. This is the application for the Pell Grant, and all undergraduate students applying for financial aid are required to apply as eligibility for the Pell Grant must be determined before other undergraduate aid can be calculated.
3. Financial Aid Transcript forms — For transfer students only.

All three forms can be obtained by contacting the Financial Aid Office. The "Application for Federal Student Aid" should also be available at high schools.

To receive financial aid, students must be making satisfactory progress toward their educational objective. The Financial Aid Office defines satisfactory progress as follows:

1. Full-time undergraduate students must complete at least 12 UAF credits with a 2.00 GPA each semester and with a cumulative GPA of 2.00 or above.
2. Full-time graduate students must complete at least nine UAF credits with a 3.00 GPA each semester and with a cumulative GPA of 3.00 or above.
3. Part-time students must complete all courses for which they have registered with at least a 2.00 GPA for undergraduate students and at least a 3.00 GPA for graduate students.

If a student fails to satisfactorily complete a semester, he/she is not eligible to receive financial assistance from the university until he/she satisfactorily completes one semester as a full-time student.

Financial Aid Deadlines

Financial Aid application forms will be available in February.

All applications which are complete by June 1 will receive first consideration. Applications which become complete after June 1 will be processed as long as funds are available.

*An application is complete when the Financial Aid Office has received all of the following forms:

1. UAF financial aid application.
2. Financial Aid Transcripts (for transfer students only).
3. Notification of applicants' acceptance by the Admissions Office (for new students only).
4. Basic Grant Student Aid Report (SAR) all three parts. (For undergraduate students only.)

Financial Aid Definitions

Full-time student — Undergraduate student enrolled for a minimum of 12 UAF credits or a graduate student enrolled for a minimum of nine UAF credits during a semester.

Graduate student — Person who has received a bachelor's degree and is pursuing an advanced (master's or doctorate) degree.

Half-time student — Undergraduate student enrolled for at least six UAF credits but less than 12 UAF credits or a graduate student enrolled for at least five UAF credits but less than nine UAF credits during a semester.

Parents — For financial aid purposes, "parents" is usually defined to be the student's mother and/or father, or adoptive parents, or legal guardian. Refer to current Financial Aid application forms for further information.

Post-baccalaureate student — Person who has received a bachelor's degree and is pursuing an associate or bachelor's degree in another field of study.

Undergraduate student — Person who has not yet received a bachelor's degree and is pursuing an associate or bachelor's degree.

Without Class Standing (WCS) — Students admitted WCS are not eligible for financial aid.

Who May Apply for Financial Aid?

Any UAF student who anticipates being short of financial resources to meet his/her college expenses should apply. The student must plan to enroll on at least a half-time basis (depending upon the type of aid being applied for) during the 1985-86 academic year, in a program leading toward a degree or certificate. To receive financial aid, a student must be accepted for admission in good academic standing or currently enrolled in good academic standing and making satisfactory progress toward their degree objective. By UAF academic policy, "to be in good standing, undergraduate students must maintain both a cumulative and a semester GPA of 2.00 (C) or better and graduate students a 3.00 (B) or better." Students meeting SATISFACTORY PROGRESS standards are expected to reach their degree objective within specific time/credit limits; bachelor's degree students

should earn their degree by the time they have earned 130 semester credits; master's degree students should earn their degree by the time they have earned 30-36 semester credits depending upon their degree requirements; and Ph.D. candidates must earn their degree within a time frame determined by the student's committee and college.

Federal financial aid programs (Pell Grant, GSL/FISL) also require that the student be a U.S. citizen, national or permanent resident; a citizen of the Northern Mariana Islands, a permanent resident of the Trust Territory of the Pacific Islands; or be in the U.S. for other than temporary purposes and intends to become a permanent resident. The student must not owe a repayment on a Pell Grant or SEIG and must not be in default on GSL/FISL received for attendance at this institution.

Only course work undertaken in attendance at UAF may count toward financial aid requirements. Community college, video, correspondence and/or other college level work not offered by UAF may not be used to fulfill the full-or part-time UAF financial aid requirements.

What Kinds of Financial Aid Are Available?

There are basically TWO TYPES of financial aid offered by the Financial Aid Office.

1. GRANTS AND SCHOLARSHIPS
   Grants and scholarships need not be repaid. Scholarship awards are based upon academic achievement as well as financial need and are available only to undergraduate students who have not yet earned a bachelor's degree.
2. LOANS
   Educational loan programs (federal and state) allow students to borrow money to finance their education. All loans must be repaid at a later date. Loan interest rates range from four percent to nine percent. Both graduate and undergraduate students may apply for educational loans.

Grants and Scholarships

Pell Grants may range from $250 to $1900 per academic year and are based upon the applicant's educational costs and family's financial situation. All undergraduate financial aid applicants who have not yet earned a bachelor's degree are required to apply for a Pell Grant. Students apply for the Pell Grant by completing the "Application for Federal Student Aid" for the 1985-86 school year. Students should not file for the Pell Grant until their own or their parents' 1984 federal income taxes have been filed with the Internal Revenue Service. Applicants who use estimated 1984 income information to apply for the Pell Grant must submit a copy of their own or their parents' signed IRS 1040(AIEZ) to the Financial Aid Office, or must request the IRS to send a certified copy of the 1984 tax form to the Financial Aid Office. Note: All applicants for the Pell Grant are advised to keep a copy of their signed 1984 income tax form should their Pell Grant application be selected for validation.

Approximately six to eight weeks after the student has submitted an application for the Pell Grant, the federal processor will mail the applicant a Student Aid Report (SAR). Eligible applicants must submit all three parts of the SAR to the Financial Aid Office before an award notification can be made or funds released to the student. Students not eligible for the Pell Grant should send one copy of the SAR to the Financial Aid Office as they may be eligible for other aid.

A student is eligible to receive a Pell Grant for the period of time required to complete the first undergraduate baccalaureate course of study being pursued by that student. Students must be enrolled on at least a half-time basis in order to receive a Pell Grant.

University Scholarships are based primarily on financial need, but academic competence is also considered. Applicants must be a 1985 Alaska high school graduate or must have completed at least two semesters as a full-time student in good standing at UAF. Applicants must enroll as a full-time student in order to receive a university scholarship or grant. UAF scholarship awards range from $200 to $1000 per academic year and are available only to students pursuing their first bachelor's degree.

University Endowments: The University of Alaska Foundation Office administers a number of scholarships in various fields of study at various times of the academic year. These scholarships usually require a separate application form which is available at either the UAF Financial Aid Office or the University of Alaska Foundation Office.

Fee/Tuition Waivers and **Talent Grants** are available in limited numbers to first time freshmen and new transfer undergraduate students with demonstrated abilities in numerous fields of study. Application should be made as early as possible to the head of the department in which the applicant wishes to study and to the Office of Admissions Counseling.

Bureau of Indian Affairs Grants-in-Aid are available to undergraduate Native American students with financial need. Information and application forms may be obtained from the student's local BIA area office.

Alaska State Educational Incentive Grant program provides grants to students enrolled in good standing in an undergraduate degree program. Grant awards range between $100 and $1500 per year and are dependent upon financial need. To be eligible, the applicant must have been an Alaska resident for at least two years immediately prior to applying. The applicant must also complete a Financial Aid Form (FAF) and request that results be sent to the Alaska Commission on Postsecondary Education (Code no. 0276). The SEIG form may be obtained from Alaska high schools and Alaska postsecondary schools.

Senior Citizen Fee Waivers are available to persons 60 years of age or older who have resided in the state of Alaska for the preceding 12 months. Such a person may enroll in any classes offered by the University of Alaska-Fairbanks for which he/she is qualified, except those classes where student work space may not be available. Applications for senior citizen fee waivers may be obtained from the Office of Admissions and Records.

Loans

The Guaranteed/Federally Insured Student Loan Program enables a student to borrow directly from a bank, credit union, savings and loan association or other participating lender who is willing to make the educational loan. The loan is guaranteed by a state or private non-profit agency, or insured by the federal government. Students who are enrolled or have been accepted for enrollment at least half-time are eligible to apply. The maximum undergraduates may borrow is $2,500 per year up to a maximum of $12,500. A graduate or professional student may borrow up to $5,000 per year, up to a total of $25,000 for graduate or professional study, including loans made at the undergraduate level. Interest rates are approximately eight percent and an origination fee may be charged. The federal government pays the interest on the loan as long as the student remains enrolled as at least a half-time student.

The loan must be repaid. Payments normally begin between six and 12 months after graduation or termination of at least half-time enrollment and the borrower may be allowed to take up to

10 years to repay the loan. The amount of the payments depends upon the size of the debt and ability to pay; but in most cases at least $360 a year is required unless circumstances as agreed upon by the lending institution warrant a lesser amount.

Repayment may be deferred for up to three years for service in the armed forces, Peace Corps or full-time volunteer programs conducted by ACTION (which includes VISTA, University Year for ACTION, ACTION Cooperative Volunteer Programs, Volunteers of Justice and Program for Local Service). In addition, deferment is available during full-time study at an eligible institution, or for study under a graduate fellowship program. A single deferment for a period of not more than one year is also provided for students who are unable to find full-time employment.

Information and application forms are available from the loan officer at your hometown bank. All applicants for Guaranteed/Federally Insured Student Loans must complete the University of Alaska Financial Aid Application and must be admitted to UAF in good academic standing to a degree, or certificate program or currently enrolled in good academic standing in a degree or certificate program. Undergraduate applicants must also apply for the Pell Grant.

A **Parent Loan** program was established by Congress in October 1980, to provide up to $3,000 annually and $15,000 cumulatively. The total amount borrowed by student and parent cannot exceed the total cost of education. The interest rate is nine percent; repayment must begin within 60 days. Contact your local lending institution for more information.

Alaska Student Loans are restricted to applicants who have been Alaska residents for at least two years immediately prior to applying. Undergraduates may borrow up to $6,000 per year and graduates up to $7,000. Application is made directly to Juneau. Write the Division of Student Financial Aid; Alaska Postsecondary Commission; Pouch FP; Juneau, AK 99811, for further information and application forms. Application forms are also available at Alaska high schools and Alaska postsecondary schools.

Students wishing to obtain information about their Alaska Student Loan application must contact the Alaska Student Loan Office in Juneau rather than the school's Financial Aid Office.

University Loans are short-term loans for enrolled students and are made to cover unanticipated/emergency education-related expenses. Students who have completed at least one semester as a full-time student in good standing at UAF may apply for a maximum of $500 per academic year. Interest rate is four percent per annum. Loans must be repaid by December 1, 1985 for students who terminate studies at the UA at the end of the fall 1985 semester; by April 15, 1986 for students leaving at the end of the spring 1986 semester; or by July 15, 1986 for students who will be returning to the UA for the fall 1986 semester.

Applicants must be in good academic standing and must have no outstanding debt with UAF. A co-signer is required and students are required to verify their need for the loan. Applications will be accepted from the first day following late registration until 30 days before the end of each semester.

Emergency Loans are available to regularly enrolled full-time students whose financial need is modest and temporary. Students may borrow up to $100 maximum to be repaid within 30 days. A $2 service charge is assessed for each loan.

Applicants must be in good academic standing and must have no outstanding debt with UAF. Applications will be accepted from the first day following late registration until 30 days before the end of each semester.

Independent or Dependent?

The financial need of a *dependent* student is calculated on the basis of the student's and the parents' resources.

The financial need of an *independent* student is calculated on the basis of the student's (and spouse's) financial resources. Marriage or age does not automatically establish independence.

Students answering "yes" to any of the six questions below are *dependent*. Students who can answer "no" to ALL of the questions are *independent* for financial aid purposes.

1. Did or will you live in your parents' home for more than six weeks in 1984? 1985?
2. Did or will you receive $750 or more in financial assistance from your parents during 1984? 1985?
3. Did or will your parents claim you as a federal income tax exemption in 1984? 1985?

DEADLINES

All applications that are complete by *June 1, 1985* will receive first consideration for funding for the 1985-86 academic year.

In order to meet the *JUNE 1* priority deadline, students should obtain and complete THE APPLICATION FOR FEDERAL FINANCIAL AID by MARCH 1.

All applications which become complete after June 1, 1985 will be processed as long as funds are available.

For further information and forms contact:

FINANCIAL AID OFFICE
UNIVERSITY OF ALASKA-FAIRBANKS
5TH FLOOR, GRUENING BUILDING
FAIRBANKS, ALASKA 99701
PHONE: (907) 474-7256

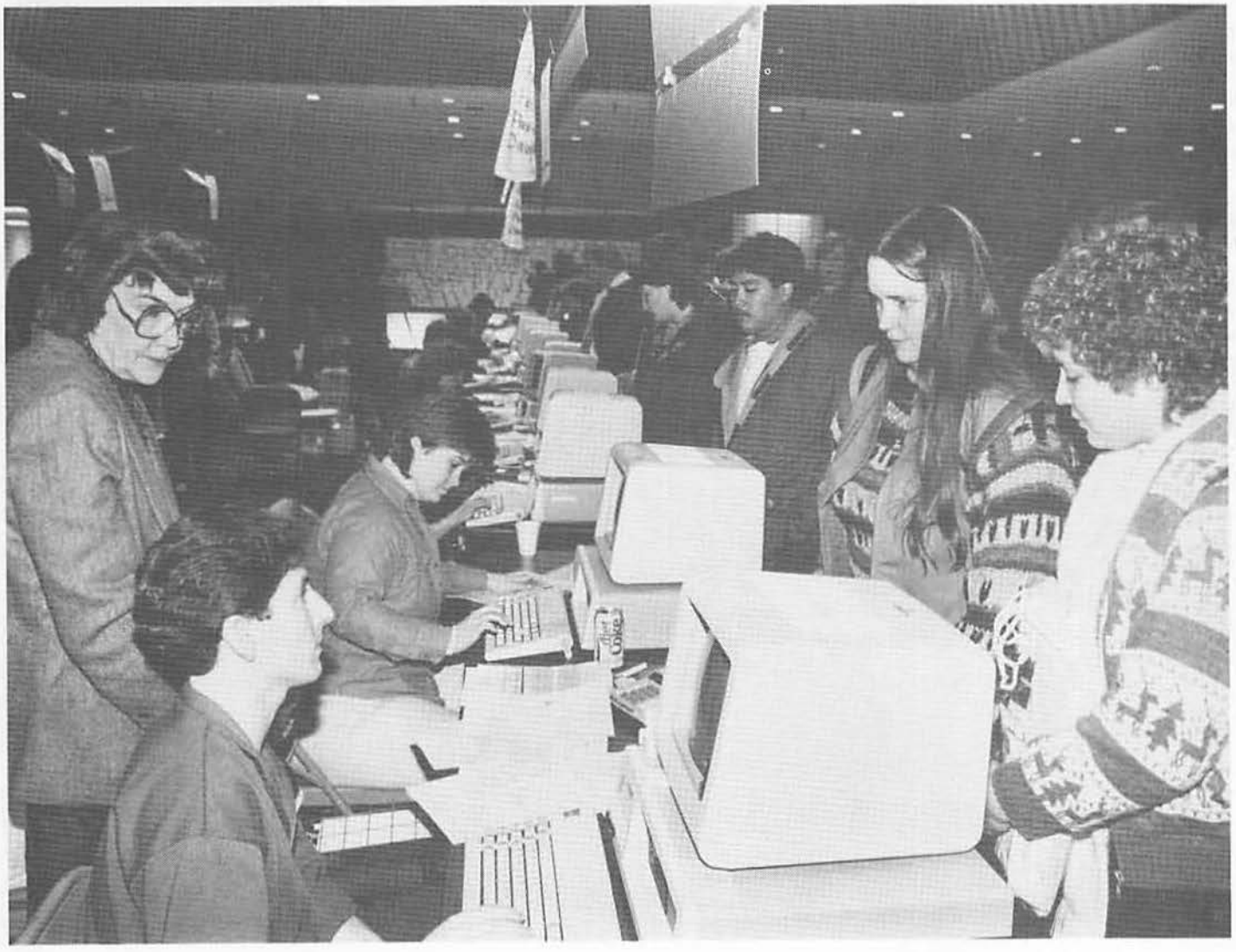
or

For Foundation Administered Scholarships:
UNIVERSITY OF ALASKA FOUNDATION
590 UNIVERSITY AVE., SUITE 101
UNIVERSITY OF ALASKA
FAIRBANKS, ALASKA 99701
PHONE: (907) 474-7687

University Of Alaska-Fairbanks
Financial Aid In Brief

Item	*Date/Deadline*
Forms Available	February
***Federal Student Aid Application**	March 1
UAF Financial Aid Application	June 1
Financial Aid Transcript (transfer students only)	June 1
***Basic Grant Student Aid Report (undergraduate students only)**	June 1
Notification of applicant's acceptance by Admissions	June 1

*In order to meet the June 1 UAF deadline, the Federal Student Aid application should be submitted to the federal processor no later than March 1. This will ensure that the eligibility determination will be received by the applicant in time to meet the UAF deadline for submittal.



Housing Information

In General

All freshmen students under 21 years of age are required to live in a university residence hall during their first year on campus unless: (a) they live at home, or (b) they have special permission from the Dean of Students.

Each residence hall is staffed with a head resident and several resident advisers. The head resident is responsible for the administration, programming and counseling within the hall. The resident advisers are full-time students who work with the head resident in planning and administering a program of social, recreational and governmental activities.

Housing Deadlines

The University of Alaska-Fairbanks is experiencing an increased demand for on-campus housing. This demand makes it necessary for students to reserve residence hall space well in advance. The UAF currently has a substantial waiting list for married student housing. Contact the Housing Office for more information on the availability of married student housing.

Eligibility

Students must maintain full-time status (12 credits for undergraduate and nine credits for graduate students) to qualify for student housing. Extended registration is considered full-time for purposes of housing allocation. Students should consult the housing staff about regulations concerning maximum terms of occupancy for each degree level.

Rooms

Student rooms are equipped with a bed, desk, chair, mirror and bureau for each resident. The university does not provide bedding (sheets, pillows, blankets), towels or face cloths. Each hall has a recreation-lounge, laundry and storage facility area. Regular custodial service is provided in common areas such as corridors, lounges and bathrooms.

Room Assignment

Hall reservations are made on a first-come, first-served basis provided application and deposit requirements have been completed. Graduate students and upper-class students are given preference over new students in single room assignment. Specific room assignments will be given to the student upon his/her arrival in the residence hall.

UAF reserves the right to reassign individuals to different rooms, halls or apartments at any time in the event such reassignments are determined to be necessary.

Residence hall students are permitted to remain on campus during the Thanksgiving, Christmas and spring vacation periods at no additional cost.

Restrictions

Guns, ammunition and flammable or volatile materials are not permitted in residence hall rooms. Students bringing these items to campus will be required to keep them in a supervised storage room. THERE IS ABSOLUTELY NO EXCEPTION TO THIS POLICY. Animals are not permitted in campus student housing. Toll telephone calls may not be made from residence hall floor phones, nor should incoming toll calls be accepted. Pay telephones are available.

Automobiles

Only a limited number of electric outlets for automobiles are available. All motor vehicles garaged, stored or used on campus must be registered with UAF security and bear a University of Alaska-Fairbanks decal.

Residence Halls

The Housing Office is located in the lobby of Bartlett Hall. During the academic year, the office is open from 8 a.m. to 5 p.m. During registration, the office is open extended hours. The residence halls are listed below. Building completion dates are in parenthesis after the hall name.

ANDREW NERLAND HALL (1953) houses 98 students in double and single rooms on four floors. 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 (1956) houses 98 male students in double and single rooms on four floors. McIntosh Hall is named for a former president of the Board of Regents.

WICKERSHAM HALL (1957) houses 97 female students in single rooms and suites which consist of two sleeping rooms, a study and a bathroom. This three-story hall is named for Judge and Mrs. James Wickersham. Judge Wickersham introduced into Congress the bill that created the University of Alaska, and Mrs. Wickersham served on the Board of Regents.

MORTON STEVENS HALL (1958) houses 68 men and 32 women (19 and over) in double and single rooms on four floors. The hall is named for Morton Stevens who was president of the Board of Regents from 1921 to 1932.

AUSTIN E. LATHROP HALL (1962) houses 66 men and 74 women, all in double rooms. Lathrop Hall is named for a Fairbanks businessman who served as a member and later as vice president of the Board of Regents from 1932 until his death in 1950.

IVAR SKARLAND HALL (1964) houses 138 male and female students in double and single rooms on three floors. This hall is equipped to house handicapped students. Skarland Hall was named for a long-time professor of anthropology at the university.

TERRIS MOORE HALL (1966) houses 136 female and 182 male students in double and single rooms on eight floors. Moore Hall is named for the second president of UAF.

E. L. BARTLETT HALL (1970) houses 322 male and female students in double and single rooms on eight floors. Bartlett Hall is named for E. L. "Bob" Bartlett who served 24 continuous years as one of Alaska's U.S. senators.

STUDENT APARTMENT COMPLEX (1984) is comprised of 60 two-bedroom apartments and one four-bedroom apartment, accommodating 244 single students. A board plan is not required for apartment residents since a full kitchen is provided in each apartment.

Residence Hall Application Procedures

Applications for single student housing are mailed to all students upon notification of acceptance from the Office of the Director of Admissions and Records. Student rooms cannot be reserved until the student is accepted by the university. In order to secure residence hall housing after acceptance, the student should complete the housing-board contract and mail it immediately to the Housing Office, University of Alaska-Fairbanks, Fairbanks, Alaska 99701 with a $50 reservation and damage deposit. Confirmation for residence hall housing is assured when the student receives written notification from the Housing Office. Specific room assignments will be made after Aug. 15 for the fall semester. Spring semester assignments are made as space becomes available. The contract for single student housing in residence halls is for board and room.

Continuing students are eligible for renewal of housing privileges if they: 1) complete pre-registration for the subsequent semester and 2) successfully complete a full-time academic course load. Room selection procedures for continuing students are announced prior to Dec. 1 for the subsequent spring semester and prior to April 1 for the subsequent fall semester.

Residence Hall Fees

Room Rent — Along with all other fees, room rent is due in full at the time of registration. Room charges are currently: $500 per person in double rooms, and $600 for single rooms. Room fees quoted are per semester and are subject to change. Room rental permits the use of all lounge, recreation, storage and laundry areas, and local telephone privileges.

Room Deposit — The completed application for housing, with a $50 reservation/damage deposit, must be returned to the Housing Office, University of Alaska-Fairbanks, Fairbanks,, Alaska 99701. If you decide not to attend UAF and a written statement is received by the Housing Office 45 days prior to official opening, your deposit will be refunded.

Refund of Room Deposit — If all provisions of the contract have been complied with and no charges for damages have been assessed, the $50 deposit will be refunded at the end of the school year. If moving off-campus after fall semester, notice of intent to vacate must be given to the Housing Office on or before Dec. 1 in order to be eligible for a full refund.

The deposit may be used to pay outstanding hall dues and/or charges for repair or replacement of furniture or fixtures for which the student is responsible. Charges for loss or damage of equipment or for defacement of any area in community use, such as lounges, recreation rooms, corridors or bathrooms, may be assessed equally against the residents of the area and deducted from the amount on deposit. In addition, the deposit may be used to pay other outstanding university bills or charges. Any balance remaining in the deposit after all charges have been paid will be refunded after the close of the contract period. If the resident elects to reapply for room in the residence hall for the following year, the deposit will not be refunded, but will be transferred to the renewal application.

Contracts — Room and board contracts are for one semester. An application for housing becomes a binding contract at the beginning of the fall semester. Contracts for fall semester are automatically renewed for spring semester on Dec. 1 unless the Housing Office receives a notice of intent to vacate.

Contracts are voided if the student doesn't attend UAF full-time or is released from the contract because of marriage, health reasons or other emergencies deemed appropriate by the Dean of Students.

Meal Ticket

During registration each residence hall student is required to purchase a meal ticket for dining hall meals in the Lola Tilly Commons. Full payment for a semester meal ticket is required at that time. There are 19 scheduled meals per week (breakfast, lunch and dinner are served Monday through Friday and brunch and dinner are served Saturday and Sunday). Students may choose to purchase a full board plan or a two-meals-per-day board plan.

Meal tickets are effective from the evening of the first day of upper class registration through the last day of final exams. Limited food service is available on a cash basis during vacation periods, except on official university holidays.

Family Housing

Family housing is provided in several areas. All units are furnished except for personal items such as dishes, utensils and bedding. Laundry facilities are provided but not always on an individual basis for each unit. Storage facilities are extremely limited, and students are not encouraged to bring their own furniture. Parking areas are provided for each housing complex. Pets are not allowed.

The on-campus units with their completion dates in parentheses after their names are listed below.

MODULAR UNITS (1970) contain 30 efficiency units for married students without children.

HARWOOD HALL (1964) houses 36 married student couples without children in one bedroom and efficiency units. Harwood Hall is named for Boyd Harwood, a former member of the Board of Regents.

STUART HALL (1956) contains 12 units for married students. Stuart Hall is named for Walter T. Stuart who was a member of the Board of Regents.

WALSH HALL (1958) houses 12 married student couples without children in one-bedroom units. Walsh Hall is named for the late Michael Walsh, of Nome, who was a member of the Board of Regents.

NEW MARRIED STUDENT HOUSING (1972) contains 72 units consisting of: 16 one-bedroom; 48 two-bedroom; and eight three-bedroom units. Children are allowed and units are assigned according to family size.

GARDEN APARTMENTS (1964) houses six student families with children. Apartments are unfurnished to provide an alternative to furnished facilities.

The off-campus housing available is listed below.

YAK ESTATES (1971) townhouse apartment complex located four miles from campus on Chena Ridge. There are 48 two-bedroom and 48 three-bedroom units. Children are permitted.

Applications and Eligibility for Student Family Housing

Applications for student family housing are mailed upon request by the Housing Office when proof of admission is received. Assignments are not made for student family apartments unless the head of the household will be enrolled as a full-time student. Families may not change the head of household designation. A reservation deposit of $25 is due with the completed application. An additional $50 damage deposit is required upon assignment to the apartment.

Space is always at a high demand in student family housing, and the units are therefore assigned on a first-request, first-served basis.

For more information about housing write: Housing Office, 732 Yukon Dr., Bartlett Hall, University of Alaska-Fairbanks, Fairbanks, Alaska 99701.

Student Services

General Responsibilities

The university provides services to assist students in making their educational careers more profitable and meaningful. Mindful of its obligation to assist the total development of the student, the University of Alaska-Fairbanks continues to encourage individualization in the educational process.

Student services include: (a) orientation activities to assist new students in adjusting to the privileges and responsibilities of membership in the university community; (b) academic counseling and vocational testing; (c) counseling with students relative to their personal problems; (d) financial assistance by means of scholarships, loans, and part-time jobs; (e) support of student organizations, activities and interest groups; (f) special services, advising and tutorial assistance programs for students in need of these services; and (g) a full-service health center available for medical and health education services.

Orientation to Higher Education

Orientation materials and sessions are designed to assist each student in adjusting to higher education, and provide essential information. They are generally scheduled just prior to registration and may extend well into an academic term.

Student Behavioral Standards

Education at the university is conceived as training for citizenship as well as for personal self-improvement and development.

Generally, UAF regulations are designed to help each student work efficiently in courses. They are not designed to ignore individuality, but rather to encourage the exercise of self-discipline, which is imposed by a sense of social responsibility. These regulations, in most instances, have been developed jointly by staff and students.

Student Rights and Responsibilities

The university prescribes to principles of due process and fair hearings as specified in the *Joint Statement on Rights and Freedoms of Students*. Students are encouraged to familiarize themselves with this document which can be found in the Dean of Student's office.

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, or take whatever action is deemed necessary and appropriate.

A student may be dismissed for cause by the president of the university after appropriate review.

Alumni Services

The statewide Office of Alumni Relations is located in the Bunnell Building on the Fairbanks campus. All graduates of the University of Alaska and all former students who have taken courses for credit at any of the university's locations, and whose classes have graduated, are eligible to belong to the University of Alaska Alumni Association. There are no dues, but members are asked to contribute to the Alumni Fund each year.

Athletics and Recreation

Students may participate in supervised programs of intramural sports and intercollegiate athletics, or in unsupervised, open recreational and fitness activities in the Patty Center and adjacent facilities. The Patty Center has multipurpose areas which allow participation (but not always at the same time) in badminton, basketball, calisthenics, dance, gymnastics, handball, jogging, judo, karate, paddleball and weight training. The Patty Ice Arena provides year-round ice skating and hockey activities.

University trails are available for cross-country running and skiing, including a lighted ski trail. A ski hill with rope tow is used for downhill skiing.

In the intramural sports program, men and women students (and faculty, too) from the different living groups participate in more than 40 different team and individual competitions each year.

UAF sponsors intercollegiate athletic teams (the "Nanooks") at the NCAA Division II level in men's and women's basketball, men's and women's cross-country running and skiing, men's ice hockey, women's volleyball, co-ed rifle and swimming. Students may try out for these teams by contacting the appropriate coach.

Campus Center/Cocurricular Activities

The *William Ransom Wood Center* is UAF's answer to cabin fever. The bold, massive architecture complements modern Alaska and, at the same time, recalls her frontier ruggedness.

Facilities and services of Wood Center are designed to meet the varied out-of-class needs of the campus community — whether recreational, cultural, leisure, personal, or facilitative. Food service, meeting rooms, and lounge and exhibit areas, in addition to providing their specific functions, also lend themselves to additional special programming.

Service-oriented functions of Wood Center include campus information, facility scheduling, lost and found, sundry sales, and campus switchboard. Showers, laundry facilities and rental lockers are available for use by university students and faculty. Darkrooms and a general-purpose workroom provide students with areas for developing specific skills. The games area is equipped with foosball, pocket and carom billiards, snooker, table tennis, video games and bowling lanes. The area is regularly used for tournaments, classes, and open play. The Pub, which serves beer, wine and non-alcoholic beverages, is also located in Wood Center. The Pub provides a wide variety of entertainment for the university community.

A.S.U.A., the *Sun-Star* and Wood Center administrative offices, located on the mall level, make up the hub of student activities on campus.

In coordination with the Associated Students of the University of Alaska (ASUA), the student self-governing body, the Office of Student Affairs promotes and provides staff guidance for the development of a wide range of co-curricular activities. ASUA specifically sponsors the newspaper *Sun Star* and numerous recreational, social, educational and service activities. Additionally, many groups representing recreational, religious, departmental social and special interests are available for student involvement.

The university recognizes the importance of a proper balance between curricular and co-curricular activities.

Career Planning and Placement

Career Planning and Placement offers the student and alumni a variety of services. Ideally, upon entry to the university each student should continue to develop lifestyle and career goals. In cooperation with faculty and advisers, the staff in Career Planning and Placement works with any interested student to ensure a well-planned academic program, developed to maximize successful attainment of the student's life and career goals. The Career Planning and Placement staff offers counseling assistance, provides a variety of career information and assists the student in finding summer jobs, and in some cases academic internships, which help toward employment after graduation.

Students are encouraged to make use of the various job hunting aids available at the center. These include placement files, tips on writing a resume, help in preparing for interviews and information on current job openings. Each year many employers visit the campus to recruit students and alumni. The Career Planning and Placement office coordinates this activity. Many employers place job openings with Career Planning and Placement and an attempt is made to match the needs of the employer with those of the students and alumni making use of the center.

Center for Health and Counseling

Once health was viewed as merely the absence of physical illness and it was seen as the responsibility of health professionals. Now health is viewed as a positive growing condition of the total person and people take more responsibility for their own health.

Preventive, educational, diagnostic, and remedial medical and psychological services are offered by the center staff, as well as student health insurance claim processing services.

Medical Services — Outpatient service is provided by full-time registered nurse practitioners and a physician. The primary care benefits that you receive by paying the health fee include all routine office care or outpatient services including family planning, routine physical examinations and immunizations.

Diagnostic services including laboratory procedures are available at the health center. The health fee does not cover the "Pap" test or some other routine examinations or the cost of medications, but these are available on a fee-for-service basis. X-ray services are not available on campus, but are available at any of the medical care facilities in Fairbanks.

Personal Counseling — Counseling is a process that allows individuals to explore their own personal feelings, doubts and problems without being judged, evaluated or pressured. The counseling staff believes in the idea that one does not need to be sick in order to get better. Counseling occurs with individuals, couples, with families or within small groups of concerned students. These counseling interactions are kept confidential.

Special Groups — The center periodically offers special groups for students with similar needs, such as: a group to develop study skills, a group to reduce anxiety, a group for overweight people, an assertiveness group or a pre-marriage workshop. Students are encouraged to suggest areas of concern where special groups may be helpful.

Early Orientation for New Students

Prior to registration each semester, Early Orientation for New Students (EONS) is offered to all new students. Materials concerning this program are forwarded to students upon their admission by the university. This helpful activity is designed to assist students with their adjustment to collegiate life by providing essential information about the university's programs and services. Attendance at EONS is strongly advised.

Fairbanks Assembly

The primary organization for university governance is the Assembly. The Fairbanks Assembly of the University of Alaska-Fairbanks provides official representation for the faculty, staff and students in matters which affect the general welfare of the university and its educational purposes and effectiveness.

It also functions as a legislative body having primary authority to initiate, develop and review policy pertinent to the Fairbanks campus, including, but not limited to staff affairs, academic affairs, student affairs, budget and space utilization.

By considering all appropriate matters referred to it by the Fairbanks chancellor, the Assembly serves as a consulting body and instrument by which information of campus-wide interest and concern may be freely collected, disseminated and discussed by the staff and students.

The Fairbanks Assembly provides representatives to the Statewide Assembly.

The Fairbanks Assembly is charged with carrying out its responsibilities and functions subject to the authority of the president of the University of Alaska. Fairbanks Assembly actions subject to review and approval by the chancellor, acting for the president of the university, are binding.

Representatives of faculty, staff and students make up the Assembly which consists of 30 representatives plus one presiding officer. All representatives must be elected from and by the unit they will represent except the administrative representatives who may be appointed by the chancellor. Students are elected from the student body and are encouraged to participate.

Additional information is available through the Fairbanks Assembly office.

Foreign Student Advising

The Foreign Student Adviser assists students who are not citizens of the United States with problems they may have in adapting to American/Alaskan culture and adjusting to the unique characteristics of American higher education. Additionally, the Foreign Student Adviser is responsible for issuing the form I-20 needed to obtain a student visa and acts as a liaison between the foreign student and the U.S. Immigration and Naturalization Service.

Handicapped Students

Curb cuts and ramps have been installed at the University of Alaska-Fairbanks to make it easier for everyone to traverse the

campus. Most campus buildings contain accessible restroom facilities and elevators; the library and museum are accessible and the swimming pool is equipped with a hydraulic lift. Skarland Hall provides special living accommodations and is connected to two other residence dorms by an indoor concourse.

It is the university's policy to make all programs and activities readily accessible through relocation of classes and activities whenever possible, with reasonable structural modifications, or by other means for qualified handicapped students. Contact the Coordinator of Services for Handicapped Students, 514 Gruening Building, University of Alaska-Fairbanks, Fairbanks, Alaska 99701, (907) 474-7317 or Equal Opportunity/Affirmative Action Office, 109 Bunnell Building, University of Alaska-Fairbanks, Fairbanks, Alaska 99701, (907) 474-7919.

Section 504 Coordinator

Section 504 of the Rehabilitation Act of 1973 mandates equal opportunity for qualified handicapped persons in education programs and activities of all recipients of federal financial assistance. The law prohibits discrimination on the basis of handicap.

The campus Section 504 Coordinator is located in 109 Bunnell Building. All concerns and/or allegations that relate to Section 504 are to be directed to the Section 504 Coordinator.

Rural Student Services

In response to the needs of students from rural areas of Alaska and students whose cultural background is different from that of the majority of the campus student body, UAF has developed a program called Rural Student Services. The primary concern of this program is helping the student make the transition from a small-school and rural environment to the complexities of university life. The program offers services to students from all cultural backgrounds. The program is especially responsive to the needs of the Alaska Native student.

Rural Student Services staff offers a place for the student to seek counseling, information, tutoring and help on many aspects of university life. The program offers help and advice to the student during registration. Entering freshmen may choose to use RSS staff members for academic advisement until a time when they have found an academic area of special interest to them. A lounge is open for students and faculty in which they may relax and visit.

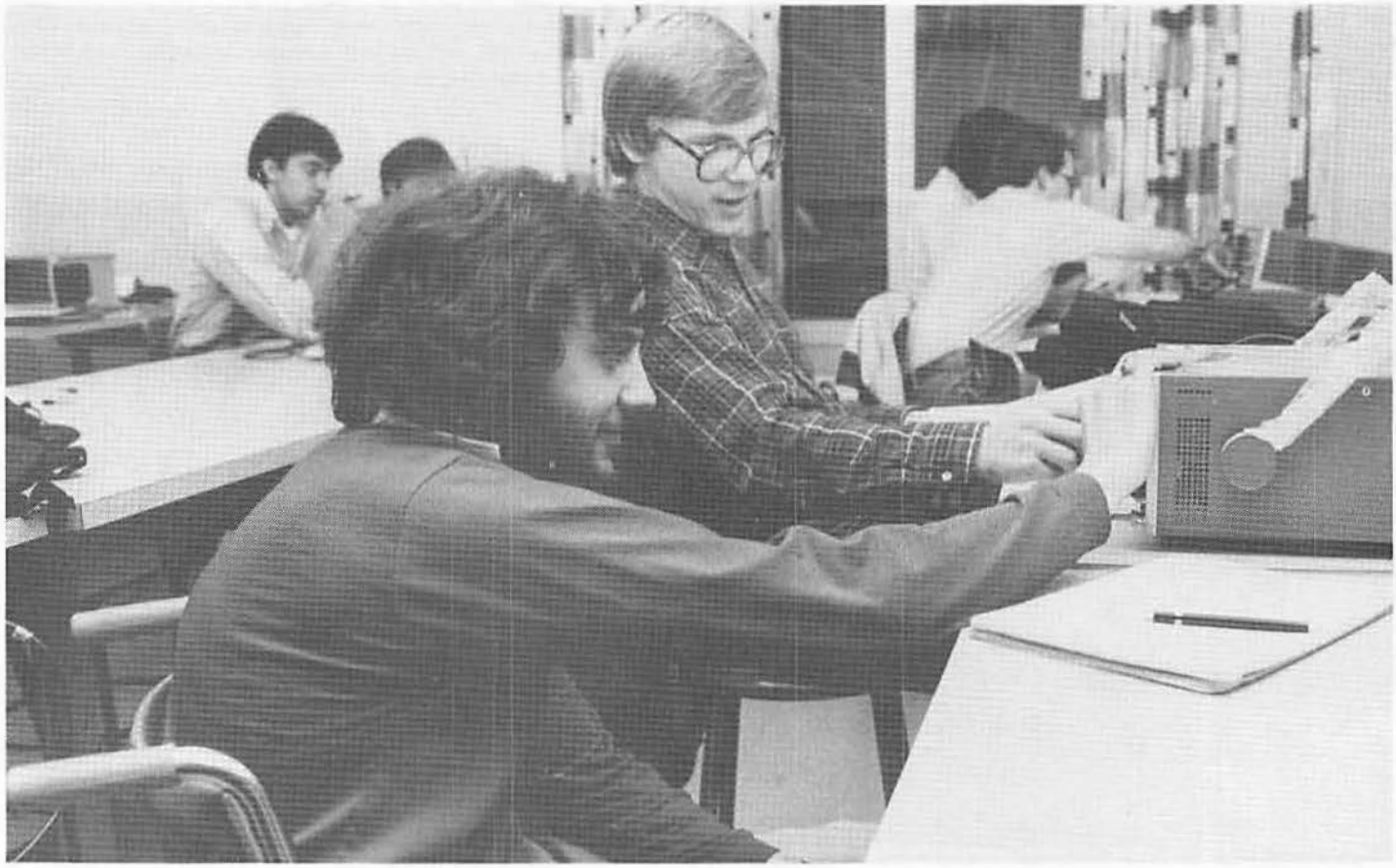
Recruitment activities in rural Alaska, as well as special strategies developed in conjunction with rural schools to better prepare students for college, is an emphasis of Rural Student Services.

Tutoring

The university provides free tutoring to UAF students who want to improve their performance in their course work. As part of the Special Services academic support program, funded in part by a grant from the U.S. Department of Education, the tutoring service employs undergraduate and graduate students to provide individual and small group instruction to UAF students in virtually every subject taught on campus as well as in study strategies and habits. Housed within Alaska Native Programs in the College of Liberal Arts, the tutoring program's services are available to all students.

The Women's Center

The Women's Center, located adjacent to the Center for Health and Counseling, serves as a gathering place for groups and a resting place for individuals. Although the primary emphasis of the center is on responding to the needs and priorities of women students, resources and activities are also open to women faculty, staff and family members. A variety of forums, including workshops, noon hour programs, lending library, counseling and referral services, are offered. The Women's Center is a focal point for identifying and addressing issues of educational, economic, political, social and emotional concern to women. The center is open daily and students are encouraged to drop in for information, assistance and respite.



Research

The research programs of the University of Alaska-Fairbanks take advantage of the university's unique location in the subarctic of interior Alaska, with easy accessibility to the oceans from the Pacific to the Arctic, accessibility to glaciers and permafrost areas, and a 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 some research carried out in its academic departments, the university has a number of research institutes and centers that focus upon problems of the Arctic and subarctic concerning the environment of the earth, renewable and non-renewable resources, energy sources and the peoples of the north.

Agricultural and Forestry Experiment Station — The research of the Agricultural and Forestry Experiment Station is directed toward increasing the production of food and wood products, and wisely using the state's lands for agriculture, forestry and recreation. Specifically, the objectives are: (1) to increase the efficiency of production systems for food and wood products, including energy conservation and the development of new lands; (2) to improve processing, transportation and marketing of food and wood products in Alaska for markets in Alaska and for export; (3) to improve resource inventories and develop land-use planning for agriculture and forestry that will enhance environmental quality; and (4) to develop resource management for improving the quality of life, including revegetation procedures, landscaping and home gardening, and outdoor recreation. Work toward these objectives is carried out in cooperation with the U.S. Department of Agriculture.

Research centers of the Agricultural and Forestry Experiment Station (AFES) are located on the UAF campus and at Palmer in the Matanuska Valley. A plant-materials center, established cooperatively by AFES and the state's Department of Natural Resources, is located near Palmer. Agronomy research is conducted within the Delta and Point MacKenzie Agricultural Projects. Research on animal science and range is under way in western Alaska in support of Alaska's reindeer industry. In addition, the Forest Soils Laboratory is conducting studies within various kinds of forests in interior Alaska in cooperation with federal scientists from the Institute of Northern Forestry, U.S. Forest Service.

The Fairbanks research center of AFES has a staff representing the disciplines of agricultural engineering, agronomy, animal science, botany, economics, forestry, horticulture, outdoor recreation, plant pathology, range science and resource management. The Palmer research center has scientists in agronomy, animal science, agricultural engineering, horticulture and range science. Scientists from the Agricultural Research Service, USDA, representing the disciplines of weed and soil science work cooperatively with AFES at the Fairbanks and Palmer research centers.

Research programs at these various locations provide research opportunities for graduate students.

Alaska Cooperative Fishery Research Unit — This is a cooperative venture between the University of Alaska-Fairbanks, the Alaska Department of Fish and Game and the U.S. Fish and Wildlife Service. The purpose is to conduct education and research programs on the structure and function of arctic and subarctic freshwaters as they relate to fishery resources, with emphasis on interior Alaskan streams and lakes.

Research projects deal with all aspects of a fishery — organisms, habitat and society — in pursuit of basic knowledge and management-oriented results. Staff activities emphasize graduate student training, personal research and technical assistance to other agencies and individuals. In addition to classroom instruction, the unit sponsors an annual workshop as in-service training for professional fishery biologists. Most research projects are field-oriented; current projects are aimed at local habitats such as the Chena and Tanana rivers.

Graduate work leading to both master's and doctoral degrees in regular university programs may be supported through the unit.

Alaska Cooperative Wildlife Research Unit — This unit is jointly sponsored and financed by the University of Alaska-Fairbanks, the Alaska Department of Fish and Game, the U.S. Fish and Wildlife and the Wildlife Management Institute. The program of the unit involves financial support and guidance for graduate training in wildlife biology and management; research related to graduate training; extension education in wildlife conservation and management through lectures, workshops and conferences; and consulting services to state, federal and other agencies and organizations.

Research emphasis is on ungulate habitat relationships, carnivore ecology, wetland bird ecology, wildlife habitat evaluation and assessment of the impact of northern development on wild animals and their habitats. Most research is conducted in the field using temporary camp facilities. Unit staff and graduate students cooperate closely with biologists of state and federal agencies and with other faculty of the university.

Graduate work leading to both master's and doctoral degrees in regular university programs may be supported through the unit.

Alaska Native Language Center — A linguistic research center based on the Fairbanks campus and administered under the Division of Community Colleges, Rural Education and Extension. The Alaska Native Language Center was established by state legislation in 1972 to document the Indian and Eskimo languages of Alaska. ANLC is the major center in the United States for the study of Eskimo and Northern Athabaskan. Many of the 12 to 15 staff members, in addition to doing research, also teach courses in the Alaska Native Language Program (ANLP) of the College of Liberal Arts or through the Community Colleges, Rural Education and Extension.

Arctic Environmental Information and Data Center — The Alaska Legislature established the Arctic Environmental Information and Data Center (AEIDC) in 1972 in recognition of the need for a resource and science information and referral center in Alaska. Located in Anchorage, AEIDC is involved primarily in the exchange of scientific information and the practical application of scientific research to problems we face today in Alaska in the areas of environment, natural resources, wildlife, fisheries, social sciences, climate, geology, and geomorphology.

The center offers three complementary services— information referral, resource and science analysis, and graphics and production. Also, in 1981 the Alaska Legislature passed a bill which formally established and funded a Climate Center within AEIDC. The center is now home base to the state's climatologist.

AEIDC maintains comprehensive in-house data files, but an additional function is to help people find needed sources of scientific information. By linking itself to other information sources around the nation, AEIDC is able to tell people what data is available and where to find it.

For the past decade, AEIDC scientists have worked together looking at resource and science questions in Alaska from a multidisciplinary point of view. They study the problems, analyze the pertinent aspects and present the issues and facts without advocating any biased position. The work of the production and communications staff is to take the scientific material and present it in a way that makes it interesting, understandable and useful to a wide variety of audiences. Presentations include reports, maps, profiles, publications, film series, television and radio programs, and briefings for various government agencies, industry, universities, Native corporations and the general public. AEIDC does not conduct a graduate program but offers its services to students. ****

Center for Cross-Cultural Studies — Established in 1971, the center is the research and development unit of the College of Human and Rural Development. It promotes programs which concentrate on the needs of Alaska's multicultural society with particular regard to the development of the state's human resources.

Objectives of the center are to design and conduct basic and applied research projects and programs; develop, conduct and evaluate alternative educational approaches for Alaskan schools; disseminate findings on current Alaskan research in education, human services and behavioral sciences, and rural development; provide technical assistance to school districts, social and family service agencies, Native corporations, local governments, community colleges and university learning centers in rural Alaska; provide professional leadership for the improvement of the training and professional development of rural as well as urban Alaskans; and provide a forum for the development of cross-cultural education programs. Opportunities are available for graduate assistants in research projects.

Future research projects will address issues in the field of cross-cultural education in Alaska, and the areas of human services and rural development. Research projects will be selected which offer the greatest promise of extending our understanding of what is occurring in rural Alaskan communities and what educational and service strategies will be most helpful. Future research will strongly incorporate the perspective of community people and practitioners.

Engineering Experiment Station/Institute of Water Resources — The Engineering Experiment Station and the Institute of Water Resources have been merged into a strong, interdisciplinary organization within the School of Engineering.

The Engineering Experiment Station, established in 1981, promotes research and educational programs dedicated to solving the engineering problems of Alaska and other northern regions. Research presently encompasses a diversity of fields ranging from basic investigations of geomagnetically induced currents on power systems to the testing and evaluation of novel road-bed devices for rural airstrip use. The special needs of the people of Alaska and the North are being helped through these studies. Cooperation with other research institutes located on campus has provided important basic information to help seek practical solutions to problems facing Alaskans.

Facilities of the station are shared with the Alaska Department of Transportation of Public Facilities Research Division (which investigates many important practical research problems) and several other academic departments of the university. Instruction with the School of Engineering includes accredited undergraduate programs in civil, mechanical and electrical engineering and also the master's degree in civil, electrical, mechanical, arctic and environmental quality engineering, and engineering and science management.

The Institute of Water Resources was established in response to the Water Resources Act of 1964 to conduct research dealing with the water resources environment in Alaska. It is located on the Fairbanks campus and has numerous research sites throughout Alaska. It conducts research concerning inland and coastal, surface and subsurface water — its availability, quantity, quality, movement and treatment, and its uses and abuses in Alaska. This institute also trains graduate students in the cross-disciplinary fields required for such a breadth of study — in the university, or with institutions elsewhere in the United States. Another function is to disseminate information, which the institute accomplishes through publications, newsletters, reports, workshops and seminars.

Geophysical Institute — The institute was established by an Act of the U.S. Congress in 1946 as a cooperative venture by the Federal government and the University of Alaska. The federal obligations and property were transferred to the University of Alaska in 1960.

The research program deals with phenomena that can best be studied at high latitude or which present special problems in Alaska. Programs are established in upper atmospheric physics and chemistry, the aurora, the earth's magnetic field, radio communications, solar-terrestrial physics, meteorology, glaciology, seismology, volcanology and several fields of geology and geochemistry. An important aspect of much of the work is the application of existing knowledge to polar problems — for example, improving radio communication services in the Arctic, assessing the earthquake risk in Alaska, studying ice movements and stresses off the north coast as a basis for engineering design of shore facilities, developing alternative energy sources, reducing the effects of ice fog and air pollution, and providing advisory services to local government.

It is housed in the C.T. Elvey Building on the West Ridge of the Fairbanks campus. The present staff numbers approximately 215 including 51 faculty members. Financial support is obtained mainly from federal agencies.

Research facilities include the Ester Dome Observatory for auroral studies, the radio transmitter Sheep Creek Station, the Chena Valley Radio Facility, the Poker Flat Research Range, a potassium-argon geochronology laboratory and an electron microscope laboratory. In addition to these local facilities, the institute uses many field stations throughout Alaska, such as the Augustine volcano station, the network of seismic sites and the meridian chain of optical and magnetic sites. The institute's library and archives offer an excellent coverage of geophysics. Specialized technical shops provide services in electronics, machine work and carpentry, photography, drafting, data processing and digital computing.

There are assistantships for well-qualified students to work with the Geophysical Institute faculty toward the master's and doctoral degrees.

Institute of Arctic Biology — Following the recommendation of a national committee of biologists, the institute was established in 1963 for studies of life in the special climates of arctic and subarctic regions. Research is directed towards understanding the structures and functions of natural ecosystems of Alaska, the impact of the increasing levels of human activities upon these systems, and the effects of Alaskan climates on man, and particularly on his health and well-being.

The ecology sector researches include biological monitoring at taiga and tundra sites and studies of ecosystem structure and function, and of the functional interactions and interdependencies of plants and animals. These ecosystem researches are closely tied to studies of the physiology and biochemistry of

micro-organisms, plants and animals which occur in arctic environments, including their nutrients, and to veterinary investigations of diseases in Alaskan wildlife.

The interest in man has largely related to anthropologic and archeologic studies of Native Alaskans (present and past) and to improvements in reindeer herd management and productivity. The study of man is now being extended to include investigations of the particular social and health problems, and the industrial and other hazards of living and working in these climates.

The institute is located in the Laurence Irving Building which provides a variety of technical and instrumental facilities and services. Special field sites include the 40-acre Experimental Biological Campus Reserve, the Cantwell Reindeer Station near Denali National Park and Preserve, a new reindeer facility at Nome, the Homer and Halibut Cove shore stations on Kachemak Bay, an arctic tundra research station at Toolik Lake, and the alpine tundra station at Eagle Summit. There is a staff of approximately 75 serving the Institute of Arctic Biology.

As concurrent members of instructional colleges, institute faculty participate in offering courses and graduate programs leading to both M.S. and Ph.D. degrees in a variety of subjects related to arctic biology.

Institute of Marine Science — The Institute of Marine Science was established in 1960 by the Alaska State Legislature for the purposes of advancing oceanographic knowledge with emphasis on problems of high-latitude seas, of training graduate students in modern oceanography and of providing both basic and applied marine research. Subsequent expansion has included research and training in marine biology, fisheries oceanography, and special problems in limnology.

Research programs now include: water circulation in the Gulf of Alaska, environmental studies at the oil pipeline terminus of Valdez, fishery systems, seagrass ecology, marine mammals, shellfish and finfish biology, ecological systems associated with the marginal ice zone, the geochemistry of lakes, upwellings of seawaters, carbon and nutrient cycles, Recent and Pleistocene sedimentation and the origin of the continental shelf of Alaska.

Research facilities include modern advanced laboratories on the Fairbanks campus and at Seward. The Seward Marine Center includes a high quality running seawater system, as well as biological and chemical laboratories. Ship operations are also based at the Seward Marine Center. The institute uses other Alaskan coastal facilities as needed. The institute's research vessel, *ALPHA HELIX*, routinely operates in the Chukchi and Bering Seas, in Aleutian waters and in the Pacific waters adjacent to Alaska.

Financial assistance for graduate students is provided through state research assistantships and stipend support coming from industry and foundation grants to the institute.

Mineral Industry Research Laboratory — The Mineral Industry Research Laboratory was established by the 1983 Alaska State Legislature for the purpose of conducting basic and applied research to aid in the development of Alaska's mineral and energy resources.

This unit, as the research branch of the School of Mineral Engineering, conducts studies concerning beneficiation of Alaskan ores, geology and mineral deposits of the state, computer applications to the industry, mining related problems in frozen ground, feasibility studies on mineral deposits, transportation system analyses, geologic mapping of selected areas, development of a data storage and retrieval system for mineral deposits and environmental studies related to mining activities.

A well-equipped coal laboratory is devoted to research and service activities on the characterization, petrography, distribution and preparation of Alaska's coals. This facility is expanding to include determination of the potential for utilizing these coals in conversion processes such as liquefaction and gasification.

Cooperative efforts are maintained with state and federal agencies, and where applicable service function is supplied to individuals and industry. Publications pertinent to the industry are issued and made available to the general public.

A close relationship is maintained with the educational program which presents opportunities for graduate studies in mineral and energy related fields.

Petroleum Development Laboratory — The Petroleum Development Laboratory (PDL) was established in 1984 to engage in practical research to develop and improve technology to maximize the recovery of Alaska's petroleum and natural gas resources. The work conducted will assist industry and state agencies in their effort to effect additional recovery of petroleum and natural gas resources.

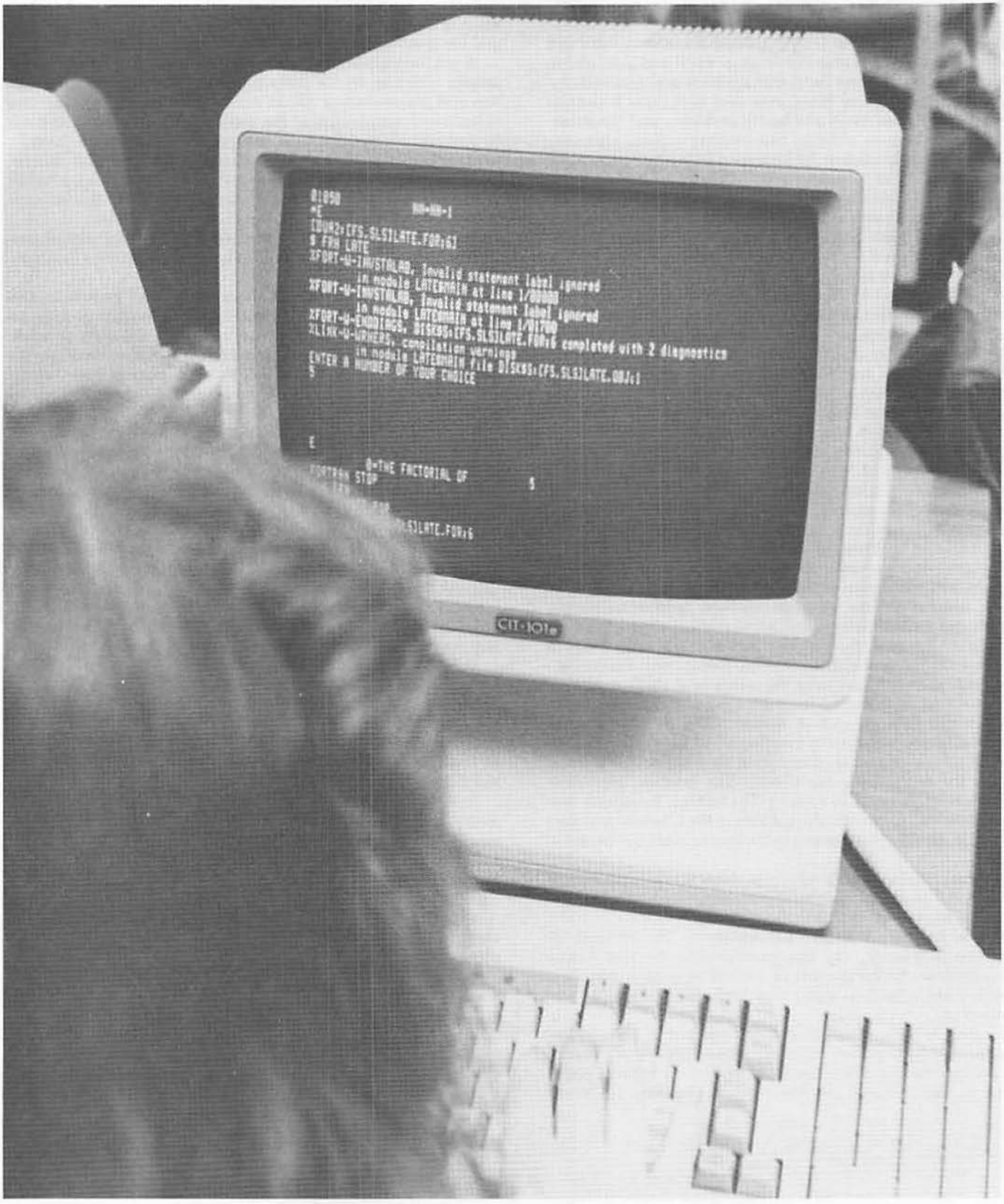
The primary function of the PDL is to explore various aspects of enhanced oil recovery research, including the production of heavy oil through thermal recovery and miscible oil displacement. The goal is to transfer the information from the laboratory and field experiments to engineers who can apply it to problems in their oil fields.

Research programs include: secondary (waterflooding) and enhanced oil recovery processes, a comprehensive study of Alaska's oil and gas reservoirs, development of thermal recovery projects to initiate production from Ugnu and West Sak fields, miscible flooding methods for tertiary recovery from Prudhoe Bay, and estimation of gas hydrate reserves in northern Alaska.

WAMI Medical Education Program — The WAMI (Washington, Alaska, Montana, Idaho) Medical Program serves as Alaska's medical school. It is accredited as a component of the University of Washington School of Medicine. The first-year medical curriculum is taught on the Fairbanks campus. Portions of the fourth-year curriculum are offered in Anchorage and Ketchikan.

Research activities include studies of rural health services delivery as well as basic biomedical studies. Patterns of employment of physician assistants in rural Alaska have been monitored since 1980. This monitoring activity is linked to efforts to bring Native community health aides into Medex Physician Assistant training at the University of Washington. Newly hired rural Alaskan health care personnel are under study in an effort to identify factors determining duration of employment in bush communities.

The nervous systems of salmon of successive development stages from juvenile through spawning adult is under study in collaboration with members of the Department of anatomy, Louisiana State University School of medicine. Subtle developmental changes in the mammalian nervous system may have more clear cut analogs in anadromous fish as they proceed from juvenile through senescent stages.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Academic and Research Support

Located on the University of Alaska-Fairbanks campus are numerous research and academic support resources, including state and federal agencies. The support units provide students with research and informational material.

Computer Network

The University of Alaska Computer Network (UACN) provides statewide distributed computing resources for all members of the university community. The computer network is independent of any specific research, administrative or educational department.

The UACN is a statewide computing facility composed of an extensive data communications network and distributed host computers. Digital Equipment Corp. VAX 11/780 and 11/750 computers located in Fairbanks, Anchorage and Juneau use the VMS operating system to provide academic and research timesharing. Electronic mail, used extensively by the university, is supported through UACN. Administrative computing is performed on a central IBM 4381-2 computer configuration at the UACN Fairbanks site. An on-line library circulation and catalog system, based on a Hewlett-Packard 3000 computer, is located in the UAF Rasmuson Library, but supports all university libraries systemwide. A Honeywell 66/40 dual processor mainframe is used to augment administrative and academic computing. The UACN data communications backbone has been designed so that from any terminal a user may access any host in the network on which she/he has resources. User support services are provided through "nodes" at the Fairbanks, Anchorage, West Ridge and Juneau campuses. UACN terminal access points are located in Kotzebue, Nome, Palmer, Valdez, Kenai, Kodiak, Bethel, Sitka and Ketchikan. Using over 5,000 land miles of satellite and microwave communication facilities, the network spans an area 1,400 by 1,100 miles. Any member of the university academic community can request computer resources for a specific course or for independent study.

Some of the software packages available to UACN users: BASIC, PASCAL, APL, FORTRAN, COBOL, C, B, SNOBOL, ALGOL, JOVIAL, SPSS, BMDP, BMD, IMSL, TSP, GPSS, Dynamo Simscript, CSMP, Sceptre, ECSP, CORNAP, IDS-II, IDMS, DataBASIC, FAMULUS, SELGEM, QED, ROFF, electronic MAIL, mini- and microcomputer cross assemblers and simulators, Calcomp, Tektronix, PLOT10, and Hewlett-Packard graphics packages, Contour and SURFACEII mapping packages.

Each node provides consulting services, access to documentation, seminars and classes, and acts as a "one stop" source for all user help. The UACN has nearly 500 terminals and microcomputers installed on the UAF campus. Dial-up ports are used by many students to access the UACN from their residence hall or apartment rooms.

In addition to the UACN computers, various departments at the University of Alaska-Fairbanks have both mini-and microcomputers for research and instruction. The Geophysical Institute has a VAX 11/780 and the Institute of Arctic Biology a Data General Eclipse S140 used for faculty and graduate research. The School of Engineering has a VAX 11/730 used for advanced undergraduate research as well as faculty and graduate research. Petroleum engineering has a PDP-11 used for research. The department of mathematical sciences has a VAX 11/750 with a cluster of 17 terminals and a PDP 11/23, both used for undergraduate computer science instruction and student and faculty research. There are also numerous microcomputer systems, some dedicated to laboratory use and some available for student use. Notably, both the School of Engineering and the School of Management maintain clusters of IBM personal computers and the department of education has a cluster of Apples for student use.

Conferences and Institutes

Conferences and Institutes was established by UAF in response to the growing and changing needs of the people of Alaska. As a part of its commitment to public service, the university assists governmental, educational, professional, business and other groups in fulfilling their needs for continuing education through a vigorous program of conferences, research institutes and seminars offered to students of all ages, before and after graduation, on or off the campus, with or without credit, formally and informally.

Programs offered may originate from requests received from governmental, educational, professional, business or special interest groups, or they may originate within the department from a recognition of special needs that can best be met through this channel. These short-term programs permit attendance by those whose crowded schedules prevent longer participation.

Conferences and Institutes offers a wide range of services through its professional faculty and staff from program planning, use of facilities, equipment and supplies, to registration services, program evaluation and publication of proceedings.

To arrange for a conference, institute, workshop or seminar, contact Conferences and Institutes, University of Alaska-Fairbanks, Fairbanks, Alaska 99701, (907) 474-7800.

Elmer E. Rasmuson Library/Media Program

The university library, named for Elmer E. Rasmuson, moved into the five-level, $10.6 million library, fine arts, and humanities complex in the fall of 1969. A 54,000-square-foot addition is scheduled for completion in the summer of 1985. The library collection consists of more than 1,000,000 volumes including books, periodicals, serial titles, government documents, microfilm, microcards, microfiche, maps, phonorecords and cassettes. Book holdings are available on open stacks for the convenience of users.

The library facility provides seating, including lounge areas, for all users and a limited number of closed carrels for use by graduate students and faculty members. Smoking rooms are located on Floors 4 and 5.

The main book collection is housed on the fourth and fifth floors. Materials are classified according to the Library of Congress system.

Floor 4 also houses the federal documents and maps collection and the juvenile collection. The documents collection is arranged by Superintendent of Documents classification and constitutes over one-fourth of the total library collection.

The map collection, adjacent to the federal documents section, includes an extensive collection of polar regions maps and the U.S. Geological Survey topographic series for Alaska, as well as maps of the United States and the world. Atlases, gazetteers, and other cartographic reference works are also available.

The juvenile collection on Floor 4 contains children's books which are used primarily by education students.

The entrance to the library is at Floor 3 which contains the circulation and the information desks, the card catalog, typewriters, computer terminals, the reference area with indexes to periodicals and newspapers, telephone directories, a current collection of college and university catalogs and study tables for student use.

Non-circulating collections which are housed on Floor 2 include current periodicals, bound periodicals, newspapers and periodicals in microform. Other microform collections include the Human Relations Area Files (HRAF) and the Educational Research Information Center (ERIC). Microfilm readers and coin-operated self-service photocopy machines are available. A computer printout of all serial and periodical titles held by the library gives call numbers for locating journals, and a serials record file lists complete holdings for each title. Current and back issues of local, national and foreign newspapers are available, including the complete run of *The New York Times*.

Floor 1 houses the rare book collection, the university archives and manuscripts collections, including the historical photograph collection and rare maps. The university archives and manuscript collection includes university records and historical Alaskan material.

The library's participation in the Washington Library Network provides the library with access to over 3.5 million catalog records of 130 libraries in the Pacific Northwest and of the Library of Congress. Subject searches can be conducted on the data base for the cost of the search.

Interlibrary loan service is made available to students and faculty through the Information Access Services department of the library. The library's membership in the University of Washington Library Resource Sharing Program and computer mail communication make the resources of the larger university libraries in the nation quickly available to augment the library resources at UAF.

Computerized literature searches are also available at actual cost plus $1 through the Information Access Services department. The computer data bases provide access to a wide variety of subject fields.

The library's department of instructional media services is divided into five areas: (1) photographic services, including cinematography; (2) graphic services; (3) video services and studio; (4) 16 mm film library; and (5) equipment services.

The department also provides many special services, such as transparency-making, laminating, equipment consulting, audio transfer and the like. The media services department is scheduled to move from the Eielson Building to the library addition in the summer of 1985. It is organized as a support function to the academic program.

The Bio-Medical library on the West Ridge of campus became a part of the university library in 1973. The Bio-Medical library has approximately 25,000 books, but the greater part of its collection consists of periodical literature. Journal titles cover the fields of medical research, biology, fisheries, veterinary medicine and the environment as it relates to cold-regions research. The circulation policies are the same as those of the Elmer E. Rasmuson Library.

The *Library Handbook* is available at the reference desk on the main floor of the Elmer E. Rasmuson Library.

KUAC

KUAC-FM broadcasts on 104.7 mHz and KUAC-TV on television Channel 9. Newcomers to the Fairbanks area will find many of their favorite NPR and PBS programs in the schedules of the KUAC stations.

Now in its third decade of service to greater Fairbanks and the outlying areas, KUAC-FM was Alaska's first public radio station when it signed on in 1962. KUAC-FM is principally a fine arts station, but it broadcasts a balanced mixture of public affairs, information and specialty programs. Its schedule draws from a number of sources, including National Public Radio and the Alaska Public Radio Network. KUAC-FM is rebroadcast in Healy and Glennallen.

KUAC-TV began broadcasting in 1971. Through a system of translator repeater transmitters, the station reaches east to Delta Junction, west to Manley Hot Springs and south to Healy. KUAC-TV's schedule includes entertainment, information and public affairs programs. These programs come from the Public Broadcasting Service, the Pacific Mountain Network, the Public Television Network of Alaska and direct from various syndicators and distributors.

Both stations enhance their schedules of network and acquired programs with local productions. KUAC's local productions originate from studios in the Fine Arts/Theater Building, or through the stations' remote production capacity from field location across the state.

The Alaska Public Radio Network and the Public Television Network of Alaska provide mechanisms for close cooperation between KUAC and other public broadcasting entities in Alaska. Through its memberships in national and regional broadcasting organizations, KUAC has ready access to audiences beyond its local service area. Program material from both stations is broadcast throughout Alaska and the Lower 48.

In addition to its broadcast activities, KUAC also provides limited laboratory facilities for students in the department of journalism and broadcasting. Most apprentice-level positions at KUAC are filled by part-time student employees.

On a facilities-available basis, KUAC offers a full range of radio and television production services - at cost - to university and other non-profit users.

University of Alaska Museum

The University of Alaska Museum is a center for the collection, preservation and dissemination of information pertaining to the north. The museum has a staff of coordinators, curators, technicians and student assistants to collect, preserve, exhibit and interpret the cultural and natural history of Alaska.

While some 100,000 people visit the exhibit area each year, the museum is more than a place to look at interesting objects. The museum is also a research center, and the staff conducts field work, teaches university courses and publishes reports.

The University of Alaska Museum administers a full range of public service and educational programs. Public lectures, children's programs and museum-related workshops are offered throughout the year.

An interdisciplinary display of objects and information from the museum's collections provides a unified view of Alaska's peoples, natural resources and events which have guided the development of the state.

The Aquatic Collection, established in 1970, contains over 44,000 specimens of aquatic invertebrates, fishes and algae. The

research effort of the curator is directed toward a basic inventory of Alaska's marine flora and fauna. This inventory is often used as a basis for environmental impact assessments.

The Archeological Collection contains approximately 1.5 million specimens, primarily from Alaska. Additional comparative exchange collections are available for study from other regions of North America, South America, Asia and Europe. The curator and professional staff conduct research encompassing state, national and international archeology. A laboratory and support facilities are maintained for students, faculty and visiting scholars for conducting archeological research.

The Ethnographic Collection contains over 14,000 objects made and used by Alaska Native people from the turn of the century to the present. Exceptional artifacts include baskets, beadwork, ivory carvings, masks, games and toys.

The Art Collection consists of approximately 700 paintings, lithographs and prints of Alaska subjects dating from the late 19th Century to the present. The works of Laurence, Ziegler, Heurlin, Lambert, Machetanz and Crumrine are well represented.

The Herbarium preserves and systematically stores plant specimens. It consists of over 112,000 specimens. These collections represent the United States, Scandinavia, Finland, Greenland, Canada, Japan and the Soviet Union, which provide data for comparative studies.

The Geology Collection includes minerals, Alaskan ores, cores and other geologic samples, and Alaskan gold.

The newly formed Tephrochronology Center includes holdings in arctic volcanic ash samples.

The Terrestrial Vertebrate Collection has 5,300 bird study skins and over 25,000 mammal specimens of skins, skulls and skeletons, representing most of Alaska's bird and mammal species. The collections are strongest in gamebirds and furbearers, sandpipers, passerines and rodents.

The Alaska Native Heritage Film Project produces films that document Alaska culture for instruction and public education statewide. The films are made using an approach developed by the project called "Community-Determined Film Making," in which the communities and individuals filmed play key roles in determining the content and direction of the films.

State and Federal Agencies

The following is an alphabetical listing of the state and federal agencies located on the Fairbanks campus.

Branch of Alaskan Geology of the U.S. Geological Survey — This branch conducts a program of geological exploration and research in Alaska. Some of the functions are geologic mapping studies and evaluation of metallic, non-metallic, 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 maps and geological reports are available for public use in the office.

Bureau of Mines, U.S. Department of the Interior — The Alaska Field Operation Center, with headquarters at Juneau, maintains a field office in the O'Neill Building. The field office provides support for the center's primary concern for mineral resources and environmental development. The functions that relate to this concern include surveillance and evaluation of industrial and commercial outlook for minerals and fuel deposits; studies to determine the relationship of mineral supply, demand and technology to the national economy; studies and projects concerning the relationship of the mineral industry to environmental problems; and engineering studies regarding effective mining practices.

The field office responds to diverse inquiries from the public and governmental agencies relating to mineral resources and environmental problems; assists in the monitoring of research projects that are conducted by the Mineral Industry Research Laboratory for the Bureau of Mines through contracts with the University of Alaska-Fairbanks and maintains liaison with local federal and state agencies in regard to efforts of mutual interest.

U.S. Army Cold Regions Research and Engineering Laboratories — This office provides environmental research related to Corps of Engineers projects and other construction projects, primarily in the arctic and subarctic regions of Alaska. Past projects include the study of oil spill impact, off road vehicle impact and revegetation needs in northern Alaska.

College Observatory — The College Magnetic and Seismological Observatory is operated by the Branch of Electromagnetism and Geomagnetism of the U.S. Geological Survey, with the main facility on the West Ridge of the Fairbanks campus and an outpost facility near Farmers Loop. Originally constructed in 1947, the observatory has expanded to 30 buildings and operates various instruments that continuously gather data for studies in the fields of geomagnetism and seismology. From 1941 to 1946 the observatory was operated by the Department of Terrestrial Magnetism, Carnegie Institution of Washington, in cooperation with the University of Alaska, and then by the U.S. Coast and Geodetic Survey until 1948. Operation of the seismic equipment dates back to 1935.

In 1973 the observatory was transferred from the National Oceanic and Atmospheric Administration of the Department of Commerce to the U.S. Geological Survey of the Department of the Interior. The general mission of the observatory is to produce accurate and comprehensive data in the field of geomagnetism and seismology and cooperate with other scientists and organizations in making studies in various scientific disciplines within the capability of personnel and facilities. The observatory monitors seismic and magnetic activity 24 hours a day. The facility plays a major part in keeping the people of interior Alaska informed of current earthquake activity and informing scientists and organizations of the occurrence of major world magnetic events. The observatory also operates the Barrow Observatory at Barrow, Alaska.

Cooperative Extension Service — The program is a cooperative educational service of the university and the U.S. Department of Agriculture. The broad purposes of the service are to provide informal education to residents of the state. Extension field offices are located in Fairbanks, Palmer, Juneau, Homer, Ketchikan, Soldotna, Petersburg, Cordova, McGrath, Sitka, Delta, Dillingham, Kotzebue, Kodiak, Anchorage, Nome and Bethel. University extension specialists and district extension agents extend the results of research by the university and a broad range of research institutions to the public. Local people are helped to identify and solve problems and to apply the results of scientific research to the improvement of businesses, homes and communities. Work with young people is conducted through the 4-H and Youth programs. Marine Advisory and Fisheries Extension programs are directed toward commercial fishermen, marine resource developers and users, and the more general marine environmental publics. Special efforts are also directed toward Alaska Native leadership and management education.

Audiences for extension programs include both rural and urban residents. Extension educators serve the consumer, as well as resource production, marketing, agri-business and marine audiences. Extension educators help citizens of the state to plan and organize for broader economic and social development. Their teaching is carried out informally through television, radio, newspaper and newsletter media, publications, business, home and community visits, special interest meetings and short courses.

Institute of Northern Forestry, U.S. Department of Agriculture — The institute is a unit of the U.S. Forest Service, Pacific Northwest Forest and Range Experiment Station. Research is focused upon understanding the ecology of, and developing methods for managing, Alaska's boreal forests. Programs are underway to determine the succession of boreal forests and the effects of fire on soil, water, flora and fauna. Field work is conducted throughout the boreal forests in Alaska. The 12,500-acre Bonanza Creek Experimental Forest and the 26,000-acre Caribou-Poker Creeks Experimental Watershed provide convenient research locations for Forest Service and university scientists.

State Division of Geological and Geophysical Surveys — This division of the Alaska Department of Natural Resources conducts cooperative investigations with university personnel and government agencies to contribute to the knowledge of Alaskan geology. The staff includes geologists, a mining engineer, minerals-laboratory personnel, mining information specialists and publications personnel.

The laboratory provides analytical services to the staff and public and also conducts independent research. Field programs are carried out by the geologists and the engineer. Technical information and advice is available to prospectors and exploration companies. An up-to-date file of mining claims and mineral occurrences is maintained, as is a host of technical reports and maps that are both free and for sale. Quarterly bulletins, project reports, maps and pamphlets summarize the division's activities.

Transportation Research Laboratory — The Alaska Department of Transportation and Public Facilities operates a research laboratory in conjunction with the department of civil engineering. The state provides equipment and personnel for routine testing of highway materials and highway research.

Virology-Rabies Unit, Alaska Division of Public Health — The Northern Region Laboratory provides viral diagnostic service for the entire state of Alaska. In addition, this office is involved with limited and applied research into both human and zoenotic viral diseases.

Other Educational Opportunities

Alaska Native Programs

Alaska Native Programs is a group of six programs and related activities in Native education which were consolidated in 1981 in the College of Liberal Arts. The six programs are the Alaska Native Art Center, the Alaska Native Language Program, Alaska Native Studies, Cross-Cultural Communications, Special Services and the Student Development Program. Related activities include THEATA Magazine, written by students enrolled in Cross-Cultural Communications courses, the Festival of Native Arts and Tuma Theater. The Student Development Program is designed to improve the university's efforts to meet the needs of the Native community, and includes the Rural Alaska Honors Institute, the Native Leadership Seminar Series and the Elders Seminar Series.

The mission of Alaska Native Programs is twofold. It is to promote Alaska Native student college completion through staff development and student skills development, and to promote understanding of the Native community through research, curriculum development and instruction. Courses are available in arts, languages, education and a variety of other disciplines. Degrees are available in Alaska Native Studies, Applied Linguistics, Yup'ik and Inupiaq languages. Courses taught in Alaska Native Programs also meet certain requirements for other degree programs at the university.

The Director of Alaska Native Programs and the rest of the faculty and staff of ANP are located on the 5th floor of the Gruening Building (474-7181), the third floor of the Chapman Building (474-7874 for the Language Program), and in the Fine Arts Building (474-7725 for the Art Center). Course descriptions can be found in this catalog under the specific academic program in which they are included.

Continuing Education Credit

Use of the continuing education unit (CEU) enables adult students to accumulate, update, and transfer their record of continuing education throughout life. The unit is applicable to the learning experiences of adults at all levels from postsecondary to postdoctoral; for all classes of adult learners, whether vocational, technical, professional, managerial or personal improvement; and in all formats of teaching and learning known to the field of education. Continuing education units may be applied as follows:

1. Continued education intensive programs in technical and professional areas.
2. Programs which may be used in partial fulfillment of certificate or licensing requirements.
3. In-service training programs to improve competence in new techniques or technical areas.
4. Programs, sponsored by technical or industrial societies through the university, designed to upgrade the performance of members.
5. Liberal education programs for the general public.
6. Paraprofessional or subprofessional training programs.
7. Vocational training programs, either in-service or in preparation for entry positions.

To arrange for CEU accreditation for your program, contact the Director, Department of Conferences and Institutes, University of Alaska-Fairbanks, Fairbanks, Alaska 99701, (907) 474-7800.

Continuing Studies

Continuing Studies provides an extensive public service outreach program conducted during evening hours and off campus. This unit serves the adult student who can only pursue academic work at times which do not conflict with occupational and family responsibilities. Evening classes are also scheduled to provide access to high-demand classes that regular on-campus students cannot obtain through departmental offerings.

Courses made available through Continuing Studies apply toward degree programs as well as contribute to personal development of adult learners. A variety of media is utilized through this unit which include audio conferencing of classes, courses delivered through television transmission and video taped lectures.

Personnel in the Office of Continuing Studies are interested in assisting individuals and groups who seek academic services to advance and enhance their personal and professional objectives. For more information contact the Director, Continuing Studies, Eielson Building, University of Alaska-Fairbanks, Fairbanks, Alaska 99701, (907) 474-7221.

Correspondence Study Program

The University of Alaska-Fairbanks does not offer courses by correspondence. However, a correspondence study program is available through another unit of the statewide University of Alaska system, the Community Colleges, Rural Education and Extension division (CCREE). For further information and a free brochure, contact the Correspondence Study Program CCREE, 115 Eielson Building, on the University of Alaska-Fairbanks campus, phone (907) 474-7222. Credits earned in this correspondence study program are considered as non-resident transfer credit at UAF.

The Honors Program

The Honors Program at the University of Alaska-Fairbanks, offers a special educational opportunity to those students willing to accept the challenge of a broad and comprehensive intellectual experience. Highly motivated undergraduate students are given the opportunity to acquire an appreciative understanding of the natural and social sciences, the arts, and the humanities in an atmosphere that promotes intellectual curiosity and maximizes independent learning.

The program is designed to attract and retain outstanding students and to provide them with a stimulating intellectual experience in an environment worthy of their academic abilities.

Eligibility

Undergraduate students from all disciplines are eligible for admission to the Honors Program. To qualify, new freshmen

must have attained a high school grade point average of no less than 3.50, a composite ACT score of no less than 26, and no individual ACT score of less than 23. National Merit Semifinalists and Finalists are automatically eligible regardless of their high school grade point average. Sophomores applying to the program must have a cumulative college GPA of 3.50 and clear admission to UAF.

Admission to the Honors Program is in the fall semester. Applications to the program must be on file by May 1 of the year applying. Credentials for admission to the university must be filed separately and should be forwarded to the Office of Admissions and Records at the same time.

Privileges Granted to Honors Program Students

1. Admission to Honors courses.
2. Pursuit of graduation "With Honors," so designated on diploma (or on a separate Certificate of Honors Completion) and commencement program.
3. Special living arrangements - a "quiet" floor or floors in a residence hall.

Program Features

Honors students must be regularly enrolled undergraduate students pursuing the baccalaureate degree. Most Honors courses will be taken in lieu of core requirements for all colleges and departments. Many are special sections of regular courses plus special Honors courses and seminars. A student must complete 32 Honors credits and a senior thesis/project (an independent research in the student's major) to receive the designation on their diploma of Graduation with Honors. Freshman and sophomore Honors courses include Honors English, calculus, science and anthropology. The Honors Seminar, the focus of the freshman program, invites lecturers from cross-disciplines and the outside professional world to explore a dominant theme. Students observe, participate in and discuss all facets of the theme concluding with a personal paper to be completed by the end of the semester. The following disciplines will also furnish Honors sections: art, biology, chemistry, economics, geography, geoscience, history, humanities, literature, mathematics, music, philosophy, physics, political science, psychology, sociology and speech communication. New courses will be offered every year.

English — An Honors section of English will be offered at the freshman and sophomore levels. Six credits of Honors English are required at these levels.

Honors Seminar — Offered every semester. Varying topics. May be repeated for credit.

Senior Honors Seminar — Restricted to senior Honors students. Research Methods. In-depth study of a selected topic, resulting in an Honors paper.

Summer Reading Examination — Offered every year. Credits variable, depending upon extent and quality of summer reading, as agreed upon between student and instructor. May be repeated for credit.

For more information and application forms write to: The Honors Program, University of Alaska-Fairbanks, Fairbanks, Alaska 99701, (907) 474-6612

International Programs

The University of Alaska-Fairbanks has recently formed the office of international programs to coordinate exchange agreements and international affairs. UAF is expanding its international commitment through cooperative agreements, both in research and teaching, with other universities, with emphasis on Pacific Rim and the circumpolar arctic universities.

Nursing

The University of Alaska-Anchorage School of Nursing is the only baccalaureate nursing program in Alaska and the majority of the course work is available on the Fairbanks campus. The School of Nursing has been designed with the unique health care needs of Alaskans in mind. A combination of climate, geography and divergent cultural backgrounds creates the opportunity — and necessity — for nurses to provide creative health care.

With this situation in mind, the curriculum at the School of Nursing has been developed to foster creativity and independent judgment as part of the role of the professional nurse. The program is built upon the nursing process model and is geared to socialize the student gradually into the role of professional nurse. The first three semesters provide the general education foundation for the nursing courses. Five clinical courses, each building upon the previous one, follow over the next five semesters. The first two courses deal with nursing care of the essentially well client. The student learns basic theory and physical assessment, communication, nursing process and community health concepts, as well as screening procedures, health teaching and well child care. The third and fourth clinical courses are the only courses not available on the UAF campus. RNs may receive credit for these two clinical courses by successfully completing the credit-by-examination process. The third course deals with nursing care of clients experiencing temporary disruptions of health, primarily in the hospital setting. During the fourth course the student focuses on nursing care of clients experiencing long-term disruptions of health in both hospital and community settings. Theory and practice include working with groups of clients and community planning programs. The final course synthesizes the principles and practice learned in the previous courses. The student spends a concentrated amount of time in a clinical area of professional interest or need, integrating, expanding and practicing concepts and skills learned throughout the nursing curriculum. The School of Nursing has received full national accreditation for this program.

For further information on the baccalaureate nursing program and continuing education offerings in nursing, please contact: UAA School of Nursing, Arctic Health Research Building, Suite 106, University of Alaska-Fairbanks, Fairbanks, Alaska 99701, (907) 474-7764

Special Summer Activities

Special summer institutes are often funded by federal and state agencies and private foundations. Summer institutes in the teaching of languages, counseling, guidance, English, science and mathematics have been held.

Special workshops and institutes open to high school age students are also presented. These include the music camp and a youth leadership conference.

An extensive recreation program is planned for summer sessions students by the Student Activities Office. Typical recreational activities include trips to Eskimo and Indian villages, goldpanning exhibitions, hiking, dances, movies, and a riverboat excursion.

Study Abroad Programs

The University of Alaska - Fairbanks offers students in all disciplines various opportunities to study abroad at the undergraduate and graduate levels. For detailed information on the following programs, contact the Chairman of the International Student

Exchange Committee, 212 Eielson Building, University of Alaska-Fairbanks, Fairbanks, Alaska 99701, (907) 474-6956.

(1) Under exchange agreements with Nagoya Gakuin University, (NGU) and Gifu University, UAF sends three to five students every year to Nagoya and Gifu and receives in turn three to five students from NGU and Gifu University. The program for Alaskan students focuses mainly on the Japanese language and culture. It begins with an intensive language training (six weeks) which is designed to prepare the exchange student to take courses in a number of disciplines ranging from intermediate and advanced Japanese language, literature or civilization to sociology, business, art, engineering, etc. NGU is a private college which specializes in the areas of business administration and economics, and cooperates, for its foreign student program, with other local colleges. A student exchange program with Gifu University in Japan has recently been established. Gifu University is located in Gifu City which is near Nagoya, Tokyo, Kyoto and Osaka. Gifu University is a national university and has been famous for its excellent faculties in education, medicine, engineering and agriculture. Applications for admission to the NGU or Gifu program for the spring semester should be presented to the International Student Exchange Program Committee chairman in late September or early October. One to three semesters of college Japanese, or the equivalent, are highly recommended before departure. Academic credits earned in the exchange program are considered UAF credits. Students selected for the exchange program are eligible for Alaska student loans.

(2) Since 1982, the University of Alaska-Fairbanks has had an exchange agreement with Soong Jun University (SJU) in Seoul, Korea. Each year it is planned that up to five students will be sent from UAF to Korea and UAF will receive up to five students from SJU. SJU has Colleges of Liberal Arts and Sciences, Law and Economics, and Engineering. The graduate school includes a School of Humanities, Social Sciences, and Natural Sciences. UAF has instituted a self-instructional program in Korean and Chinese within the Department of Linguistics and Foreign Languages. This program provides those students interested in participating in exchange programs an opportunity to study the foreign language of his/her interest before pursuing exchange studies abroad.

(3) The university is a member of the Northwest Interinstitutional Council for Study Abroad, (NICSA). Under this consortium, a group of universities of the Pacific Northwest has jointly operated, for about 20 years, liberal arts programs in England (London), Germany (Cologne) and France (Avignon). A fourth program, in Mexico (Guadalajara), was added in 1982. All NICSA-UAF programs offer liberal arts, interdisciplinary courses, with an emphasis however, for each quarter, on a particular discipline or disciplinary perspective. In recent years focal disciplines have been: history, architecture and urban planning, literature, international business, music, geography, philosophy, theater, and others. Applications for admission can be submitted for one quarter, two quarters or three quarters at one, two or three sites. In conjunction with the academic courses, several excursions are offered each term. Students live with local families. For the Avignon program a minimum of two college semesters of French prior to departure is required. For the Cologne program the language prerequisite is one college semester of German. Applications for the fall term should normally be submitted in April or early May. Those for the winter and spring terms can be submitted in September. However, it is advisable to apply as early as possible. All NICSA courses are considered UAF courses. No credit transfer is involved. Alaska student loans are fully applicable.

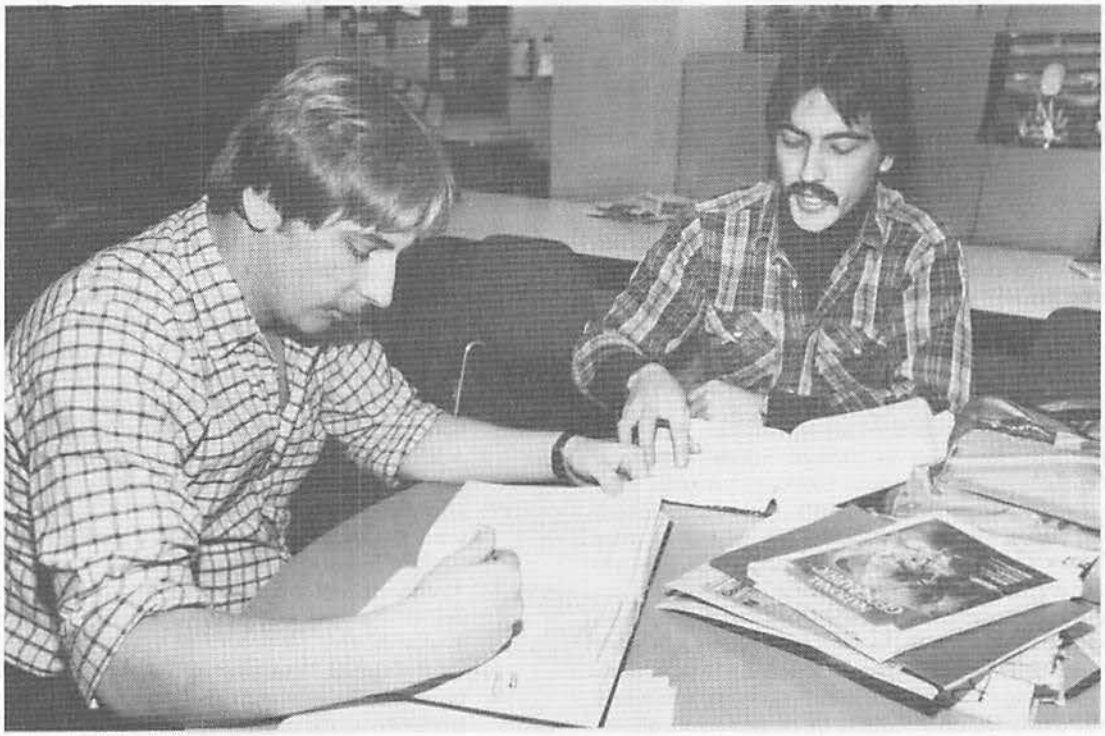
(4) A student exchange agreement with Cheng Kung University in Taiwan is being negotiated. Details will soon be available.

(5) Self-initiated, "customized" study abroad usually requires previous arrangements with the department in which the student majors, to facilitate credit transfer and general advising. In order to be formally admitted to a university in a non-English speaking country, the student must normally demonstrate a working proficiency in the language.

Summer Sessions

A wide variety of academic and non-academic programs are offered to residents and visitors during the summer. Summer classes are open to candidates for graduate or undergraduate degrees and to unclassified students wishing to take special courses without reference to degree objectives. Numerous courses and workshops are available throughout the summer. Students may choose from teacher-oriented course work, cross-cultural education, arctic-oriented studies, computer workshops, and field experiences in areas such as anthropology, biology, fisheries, geology and wildlife management. Additionally, basic degree requirements and courses heavily enrolled in during the fall and spring semesters are often available during the summer terms.

Summer Sessions faculty include members of the regular teaching staff, supplemented by outstanding visiting instructors. For more information contact the Director, Summer Sessions, Eielson Building, University of Alaska-Fairbanks, Fairbanks, Alaska 99701, (907) 474-7021.



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College of Human and Rural Development

The College of Human and Rural Development brings together the various programs that prepare persons to work in fields related to human development in the multicultural and rural contexts of Alaska. These include the fields of education, behavioral sciences, counseling social work and rural development. In addition to the programs offered on campus in Fairbanks, several programs are available on site in rural communities. The **cross-cultural education development program** (X-CED) offers an undergraduate teacher education program to students in rural areas through a network of eight regional field centers. A graduate program in cross-cultural studies and a rural teacher orientation program are also available off campus, coupled with summer course work in Fairbanks. All programs in the college seek to prepare persons to work effectively in cross-cultural settings and display a sensitivity to and understanding of the diversity of the human condition.

The college consists of three departments through which the instructional programs are administered: **Behavioral Sciences and Human Services, Education, and Rural Development.** Research and development activities involving issues associated with human and rural development are supported and administered through the **Center for Cross-Cultural Studies.** Faculty and degree offerings are listed with each department. The dean of the college is **Gerald V. Mohatt.**

Behavioral Sciences and Human Services

The Department of Behavioral Sciences and Human Services combines both the disciplinary foundations of psychology and sociology and their associated applied aspects such as social work and counseling. The goals of the departmental curricula are oriented towards providing the student not only a liberal arts education but to equip him with skills useful in functioning in rural and cross-cultural settings.

The department offers both undergraduate and graduate programs. Departmental programs include B.A. in human services, B.A. and B.S. in psychology, B.A. and B.S. in sociology, and B.A. in social work. At the graduate level, the department offers two M.Ed. programs in guidance and counseling: elementary, and secondary. The department also offers an M.Ed. in college student personnel administration and an M.A. in community psychology.

Faculty

Department Head and Professor: M.S. Nagabhushana Rao
Professors: Sarkis Atamian, E. Clifford Brennen, Charles Geist, Gerald V. Mohatt, James Orvik, John Turner
Associate Professors: Gerald Berman, John B. Booker, Richard G. Possenti, Harris Shelton
Assistant Professors: James Cole, William Connor, Carol Diehl, Kenneth Green, Elmer Haymon, Cathy Sink, Richard Stenard

Community Psychology

Degree: M.A.
Minimum Requirements for Degree: 52 credits

The M.A. program in community psychology attempts to meet the demands for trained mental health professionals in rural Alaska. The purpose of this program is to train graduate-level professionals with general skills in the area of mental health and with specific training in the areas of alcohol and drug abuse; primary prevention and other prevention approaches; or clinical, cross-cultural psychology.

Objectives of the program are:

1. to train graduate-level psychologists for rural and cross-cultural settings in Alaska
2. to place graduate-level psychologists in agencies of human and social services and education in Alaska
3. to provide mental health professionals for urban areas that have a large cross-cultural and rural population (in-migration groups).
4. to provide in-service and continuing education opportunities for mental health professionals at the graduate level with specific regard to cross-cultural and rural issues in the delivery of mental health service.

The program is oriented toward prevention as a major responsibility for the rural provider. But prevention and treatment are not separated since both must focus on building intact, naturally occurring systems in families and communities. Our program, then, sees the community as both a resource for problem solving and as the target for change. Additionally a strong clinical orientation ensures adequate skills for the mental health professional.

Admittance

Students are accepted once a year in the spring for the fall semester. Applications are generally due by April 1, although applications may be accepted at any time during the year. The program will accept a maximum of 15 students per year with the option to accept less, given limited resources.

The program requires the following for consideration:

a) Evidence of completion of the baccalaureate degree from an accredited institution in counseling, psychology, sociology, social work, human services, education or related helping professions. A minimum grade point average of 3.25 and/or evidence of personal and professional suitability for community psychology work will be sought. In part, this will be inferred from the participant's academic and employment history and an interview when possible. Also, three letters of reference will be required endorsing the applicant's admission to the community psychology program.

b) Persons who have a non-social science background must complete the necessary undergraduate prerequisites as delineated by their adviser.

c) Admission also will require the student taking the Graduate Record Examination, area exams and Miller Analogies test for consideration in the fall of 1986, and every fall thereafter. These exams are used for follow-up of students.

d) An application must include a personal statement of the applicant's purpose in seeking this degree.

e) Emphasis tracks are offered based on availability of resources. Students interested in a certain track should contact the department head before applying.

Part-time students will be accepted. However, the student must enroll in a specific course during the first year.

Course Requirements

The program requires a 25-credit (8 courses) core of courses with a 12-hour internship and three to six hours for project or thesis. The student must also complete 12 credits (four courses) from approved electives. These electives can fall within either one of three emphasis tracks or across all three upon approval of the student's adviser.

Internship

This is either a full-time, one-semester or part-time, one-year experience in a single setting under the supervision of a psychologist. Placements are arranged to occur after at least 24 credits are completed.

Requirements

Community Psychology — M.A. Degree

Required Courses:	*40-43 Credits*
Psy. 630 — Community Psychology	3
Psy. 635 — Field-Based Research Methods	3
Soc. 638 — Social Policy and Social Change	3
Psy. 650 — Cross-Cultural Psychopathology	3
Psy. 655 — Healing: Implications for Clinical/Community Practice	3
Psy. 660 — Principles of Individual Counseling	3
Psy. 661 — Cross-Cultural Counseling	3
Psy. 663 — Assessment and Practicum	4
Psy. 690 — Internship in Community Psychology	12
Psy. 698 — Project or	
Psy. 699 — Thesis	3-6

Complete 12 Credits from the following:

Option A: Alcohol and Drug Abuse

Psy. 610 — Alcohol: Pharmacology and Behavior	3
Psy. 615 — Drug Action: Physiology and Behavior	3
Psy. 618 — Community Treatment Alternatives	3
Psy. 620 — Treatment of Alcohol and Drug Dependency	3
Psy. 625 — Prevention of Alcohol and Drug Dependency	3
Psy. 668 — Crisis Intervention	3
Psy. 683 — Biological Bases of Behavior and Behavioral Change	3
Psy. 688 — Practicum in Community Psychology	3

Option B: Prevention

Psy. 618 — Community Treatment Alternatives	3
Psy. 625 — Prevention of Alcohol and Drug Dependency	3
Psy. 645 — Prevention Theories and Strategies	3
Soc./Psy. 646 — Consultation	3
Psy. 668 — Crisis Intervention	3
Psy. 670 — Advanced Cross-Cultural Psychology	3
Psy. 688 — Practicum in Community Psychology	3

Option C: Clinical

Psy. 664 — Behavior Therapy	e
Psy. 665 — Psychoanalytic Theory: Clinical Method	3
Psy. 666 — Family and Network Therapy	3
Psy. 667 — Existential Psychotherapy	3
Psy. 668 — Crisis Intervention	3
Psy. 670 — Advanced Cross-Cultural Psychology	3
Psy. 674 — Group Counseling	3
Psy. 677 — Psychological Assessment - Intelligence	3
Psy. 678 — Psychological Assessment - Personality	3
Psy. 683 — Biological Bases of Behavior and Behavioral Change	3
Psy. 688 — Practicum in Community Psychology	3

The student may take no more than six undergraduate credits as electives toward the M.A. program in Community Psychology. The following courses are among those acceptable for undergraduate credit with the approval of the student's adviser:

A.N.S. 425 — Native American Legal Rights and Legal Relationships
R.D. 450 — Managing Community Development Projects
Soc. 407 — Formal Organizations
Hm.Sv. 410 — Management of Human Service Agencies
Psy. 460 — Physiological Psychology

Guidance and Counseling

Guidance and Counseling Elementary — M.Ed. Degree

This program prepares educators to be elementary counseling consultants. The program includes: the acquisition of knowledge in counseling/consultation, appraisal and research. In addition, a supervised practicum experience is required.

Admission Requirements:

1. The equivalent of a University of Alaska Bachelor of Education degree or an Alaska elementary teaching certificate with a minimum of 24 semester hours of education courses with an average g.p.a. of 3.00 (B).
2. Three years of satisfactory teaching experience in an accredited elementary school.
3. Admission also may be contingent upon (1) satisfactory scores on various standardized tests and (2) a satisfactory personal interview conducted by behavioral sciences and human services faculty members.

Minimum Degree Requirements:

1. Complete a minimum of 39 credits in approved courses. This is a non-thesis program.
2. Pass a qualifying examination in the foundation courses after completing 15 credit hours of an approved program.
3. Pass a written comprehensive examination or design and complete a project/thesis approved by the advisory committee with an oral comprehensive examination.
4. Complete the general graduate degree requirements as listed on page 31.

Courses assigned by the student's graduate committee to remove deficiencies will not be allowed as part of the graduate program.

Required Courses:	*Credits*
Ed. 611 — Learning, Thinking and Perception in Cultural Perspective	3
Ed. 630 — Curriculum Theory	3
Ed. 690 — Seminar in Cross-Cultural Studies	3
Coun. 615 — Foundations of Guidance and Counseling	3
Coun. 624 — Group Counseling	3
Coun. 628 — Life Span Development	3
Coun. 634 — Counseling Practicum I	3
Coun. 645 — Behavioral Consultation	3
Coun. 660 — Cross-Cultural Counseling	3
SWK 306 — Social Welfare: Policies and Issues	3
Approved electives	9
(Recommended: ANS 475; Ed. 380, 601, 604; Psy. 304; Soc. 304, 405, 408; Sp.C. 330.)	

Guidance and Counseling Secondary — M.Ed. Degree

This program prepares educators to be secondary school counselors. The program includes: the acquisition of knowledge in counseling, appraisal and research. In addition, a supervised practicum experience is required.

Admission Requirements

1. The equivalent of a University of Alaska Bachelor of Education degree or an Alaska secondary teaching certificate with a minimum of 24 semester hours of education courses with an average g.p.a. of 3.00 (B).
2. Three years of satisfactory teaching experience in an accredited public secondary school.
3. Admission also may be contingent upon (1) satisfactory scores on various standardized tests and (2) a satisfactory personal interview conducted by behavioral sciences and human services faculty members.

Minimum Degree Requirements:

1. Complete a minimum of 39 credits in approved courses. This is a non-thesis program.
2. Pass a qualifying examination in the foundation courses after completing 15 credit hours of an approved program.
3. Pass a written comprehensive examination or design and complete a project/thesis approved by the advisory committee with an oral comprehensive examination.
4. Complete the general graduate degree requirements as listed on page 31.

Courses assigned by the student's graduate committee to remove deficiencies will not be allowed as part of the graduate program.

Required Courses:	*Credits*
Ed. 611 — Learning, Thinking and Perception in Cultural Perspective	3
Ed. 690 — Seminar in Cross-Cultural Studies	3
Coun. 615 — Foundations of Guidance and Counseling	3
Coun. 623 — Principles of Individual Counseling	3
Coun. 624 — Group Counseling	3
Coun. 628 — Life Span Development	3
Coun. 634 — Counseling Practicum I	3
Coun. 636 — Counseling Practicum II	3
Coun. 660 — Cross Cultural Counseling	3
SWK 306 — Social Welfare: Policies and Issues	3
Approved Electives	9
(Recommended: ANS 475; Ed. 380, 601, 603, 630; Soc. 304, 405, 408; Sp.C. 330.)	

College Student Personnel Administration — M.Ed. Degree

This program is designed to train educators to be able to function in student service positions in higher education. This training would include specifically: history, philosophy, and contemporary issues in higher education; management concepts; principles of educational psychology, measurement, and research; and supervised laboratory experiences in college student personnel agencies.

Admission Requirements:

1. One year of satisfactory experience in post-secondary or secondary education or equivalent as approved by the Admissions Committee.
2. Admission may also be contingent upon (1) satisfactory scores on various standardized tests and (2) a satisfactory personal interview conducted by Behavioral Sciences and Human Services faculty members.

Minimum Degree Requirements:

1. Complete the general university requirements and master's degree requirements, pages 29 and 31.
2. Complete a minimum of 36 credits as follows:

Required Courses:	*Credits*
Ed. 601 — Critique of Educational Research Methods	3
Ed. 618 — Higher Education: Basic Understanding	3
Ed. 654 — School Law	3
Ed. 690 — Seminar in Cross-Cultural Studies	3
Coun. 623 — Principles of Individual Counseling	3
Coun. 624 — Group Counseling	3
CSP 651 — Current Issues in Student Personnel Administration	3
CSP 655 — Practicum in Student Personnel Administration (Must be taken twice)	3/3

9 credits selected from the following:*

Ed. 611 — Learning, Thinking and Perception in Cultural Perspective (3 credits)
Ed. 612 — Cultural and Phil. Found. of Education (3 credits)
CSP 661 — Practicum in Counseling: Higher Education (3 credits)
Psy. 304 — Personality (3 credits)

*Other courses may be selected with consent of the student's advisory committee.

3. Pass a comprehensive examination.
4. Recency of undergraduate credit will be of concern to the candidate's committee when developing the graduate program.

Human Services

Degree: B.A.
Minimum Requirements for Degree: B.A. — 120 credits

The B.A. in human services was developed in response to a need for a program at the bachelor's level which prepares students to function as counselors and social service workers in rural areas. Agencies seeking middle-level, baccalaureate professionals will provide career placements. Students in this program gain knowledge about various agencies in the state that address social service needs and are trained in generic skills such as agency administration, counseling, and the usual content areas which are customarily addressed by such agencies (e.g., alcoholism and drug abuse, child and youth care, and health problems). Students will become familiar with cross-cultural issues that influence human service needs and are taught to integrate that knowledge with human service planning, delivery and evaluation of services.

The human services program at the University of Alaska-Fairbanks is interdisciplinary in its approach, cross-cultural in its content and rural in its orientation. The program is offered on campus with plans to offer it in rural Alaska when resources are available.

Requirements

Human Services — B.A. Degree
1. Complete the general university requirements and B.A. degree requirements on pages 29 and 30.
2. Complete the following integrated major-minor requirements:

Behavioral sciences core	24
HMSV 201 — Introduction to Human Services	3
Psy./Soc. 250 — Introductory Statistics for Behavioral Sciences	3
Soc. 301 — Rural Sociology	3
Psy./Soc. 473 — Social Science Research Methods	3
Psy. 210 — Cross-Cultural Psychology	3
Psy./Soc. 340 — Abnormal & Deviant Behavior	3
Soc. 408 — American Minority Groups	3
Psy. 101 — Introduction to Psychology	3
Departmental core	15
(These courses also may be applied to fill general distribution requirements.)	
Soc. 101 — Introduction to Sociology	3
Psy. 240 — Developmental Psychology in Cross-Cultural Perspective	3
Psy./Soc. 304 — Personality	3
Psy. 380 — Human Behavior in the Arctic	3
Anth. 242 — Native Cultures of Alaska	3
Human Services	18
HMSV 210 — Crisis Intervention	3
HMSV 350 — Foundations of Counseling I	3
HMSV 351 — Foundations of Counseling II	3
HMSV 230 — Alcoholism: Theories of Etiology	3
HMSV 330 — Alcoholism: Treatment and Prevention	3
HMSV 360 — The Helping Role in Child Abuse and Neglect	3
HMSV 410 — Management of Human Services Programs	3
HMSV 415 — Group Counseling	3
HMSV 488 — Practicum in Human Services	6
*HMSV/Psy. 445 — Community Psychology	3
*Psy./Soc. 370 — Drugs and Drug Dependence	3
*Soc. 310 — Sociology of Later Life	3
*Soc. 242 — The Family: A Cross-Cultural Perspective	3
*R.D. 325 — Community Organization and Development Strategies	3
Minimum Credits Required for Degree	130

*These courses, when not applied towards the major, may be applied to fill distribution requirements.

Minor in Human Service
A minor in human services requires the satisfactory completion of 15 credits of approved human services courses including HMSV 201 and 210.

Psychology

Degrees: B.A., B.S.
Minimum Requirements for Degrees: B.A. — 130 credits; B.S. — 130 credits

Psychology seeks to guide the student in an understanding of human behavior. The field of psychology is necessary for students who are preparing for graduate study in psychology and also is helpful in preparing for other career fields.

Requirements

Psychology — B.A. or B.S. Degree
1. Complete the general university requirements and B.A. or B.S. degree requirements, pages 29 and 30.
2. Complete the following departmental core requirements:

Psy. 101 — Introduction to Psychology	3
*Soc. 101 — Introduction to Sociology	3
Psy./Soc. 250 — Introductory Statistics for Behav. Sci.	3
Psy. 240 — Develop. Psychology in Cross-Cultural Persp.	3
Psy./Soc. 473 — Social Science Research Methods	3
*Soc. 301 — Rural Sociology	3
Hum.S. 201 — Introduction to Human Services	3
*Anth. 242 — Native Cultures of Alaska	3

3. Complete the folowing behavioral sciences core requirements:

Psy. 210 — Cross-Cultural Psychology	3
Psy./Soc. 340 — Abnormal and Deviant Behavior	3
Psy. 380 — Human Behavior in the Arctic	3
Psy./Soc. 304 — Personality	3
*Soc. 408 — American Minority Groups	3

4. Complete 18 credits from the following:

Psy. 230 — Psychology of Adjustment	3
Psy./Soc. 330 — Social Psychology	3
Psy. 350 — Comparative Psychology	3
Psy. 370 — Drugs and Drug Dependence	3
Psy. 440 — Learning	3
Psy./Hum.S. 445 — Community Psychology	3
Psy. 450 — Experimental Psychology	4
Psy. 460 — Physiological Psychology	4
Psy. 470 — Sensation and Perception	3
Minimum credits required for degree	130

*May be used toward general degree requirements where applicable.

Minor in Psychology:
A minor in Psychology requires 15 credits of Psychology courses including Psy. 101.

Social Work

Degrees: B.A.
Minimum Requirements for Degrees: B.A. — 130 credits

Social Work — B.A. Degree
1. Complete the general university requirements and B.A. degree requirements, page 29. (Note: Biol. 103 or Biol. 111 must be taken to meet natural science requirement.)
2. Complete the following departmental core requirements:

*Psy. 101 — Introduction to Psychology 3
*Soc. 101 — Introduction to Sociology 3
Soc. 250 — Introductory Statistics for Behav. Sci. 3
*Psy. 240 — Develop. Psychology in Cross-Cultural Persp 3
Soc. 473 — Social Science Research Methods 3
*Soc. 301 — Rural Sociology 3
SWK 201 — Introduction to Human Services 3
*Anth. 242 — Native Cultures of Alaska 3

3. Complete the following courses:
SWK 103 — Social Work: Profession and Practice 3
SWK 306 — Social Welfare: Policy and Issues 3
SWK 320 — Rural Social Work 3
SWK 342 — Human Behavior and the Social Environment 3
SWK 460 — Social Work Practice I 3
SWK 461 — Practicum in Social Work I 6
SWK 463 — Social Work Practice II 3
SWK 464 — Practicum in Social Work II 6
Soc. 242 — The Family: A Cross-Cultural Perspective 3
Soc. 363 — Social Stratification 3
Minimum credits required for degree 130

*May be used toward general degree requirements where applicable.

Sociology

Degrees: B.A., B.S.
Minimum Requirements for Degrees: B.A. — 130 credits; B.S. — 130 credits

Sociology is the study of groups and their influence on personal behavior and culture. It is concerned with social processes which give rise to and shape man's language, experience, perception, meaning, and behavior.

Requirements

Sociology — B.A. or B.S. Degree
1. Complete the general university requirements and B.A. or B.S. degree requirements, pages 29 and 30.

2. Complete the following departmental core requirements:
*Psy. 101 — Introduction to Psychology 3
Soc. 101 — Introduction to Sociology 3
Psy./Soc. 250 — Introductory Statistics for Behav. Sci. 3
Psy. 240 — Develop. Psychology in Cross-Cultural Persp. 3
Psy./Soc. 473 — Social Science Research Methods 3
Soc. 301 — Rural Sociology 3
Hum.S. 201 — Introduction to Human Services 3
*Anth. 242 — Native Cultures of Alaska 3

3. Complete the following behavioral sciences core requirements:
*Psy. 210 — Cross-Cultural Psychology 3
Psy./Soc. 340 — Abnormal and Deviant Behavior 3
*Psy. 380 — Human Behavior in the Arctic 3
Psy./Soc. 304 — Personality 3
Soc. 408 — American Minority Groups 3

4. Complete 18 credits as follows:
Required Courses:
Psy./Soc. 330 — Social Psychology 3
Soc. 363 — Social Stratification 3
Soc. 402 — Theories of Sociology 3
**9 credits from the following:
Soc. 102 — Social Institutions 3
Soc. 201 — Social Problems 3
Soc. 242 — The Family: A Cross-Cultural Perspective 3
Soc. 307 — Demography 3
Soc. 309 — Urban Sociology 3
Soc. 310 — Sociology of Later Life 3
Soc. 405 — Social Change 3
Soc. 406 — Environmental Sociology 3
Soc. 407 — Formal Organizations 3
R.D. 325 — Community Organizations and Development Strat. 3
Minimum credits required for degree 130

*May be used toward general degree requirements where applicable.
**Courses from this group not used toward the major may be applied toward general degree requirements where applicable.

Minor in Sociology:
A minor in Sociology requires 18 credits in Sociology including Soc. 101 and 102.

Education

Degrees: B.Ed., B.T., M.Ed., Ed.S.
Minimum Requirements for Degrees: B.Ed., B.T. — 130 credits; M.Ed. — minimum of 36 additional credits; Ed.S. — minimum of 30 credits beyond master's.

Faculty

Department Head and Associate Professor: William K. Pennebaker
Professors: Judith S. Kleinfeld, Dana C. Moore, Charles K. Ray
Associate Professors: John M. Booker, E. Dean Coon, David Hagstrom, William H. Parrett, C. Douglas Rider, David M. Smith, Lillian P. Stinson
Assistant Professors: Lisa D. Delpit, Perry Gilmore, Stephen F. Grubis, Barbara G. Harrison, Jerry M. Lipka*, Eric C. Madsen*, G. Williamson McDiarmid, Clifford Michel*, Linda G. Munson*, W. Gregory Murrell*, Michael J. Oleksa, Richard E. Riedl, Sandra Zecchini*
Instructors: Lynne Ammu*, Margaret E. Cowan, Claudia Douglas, Wendy J. Esmailka*, Perry T. Mendenhall*, William R. Pfisterer

*Field-based faculty.

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

Cross-Cultural Education Development Program — The X-CED program is the off-campus delivered teacher education program to prepare students to serve the unique educational needs of Alaska's multicultural population. Field centers have been established throughout the state to make the services readily available. Field centers are staffed by a full-time faculty member who is responsible for coordinating the program activities within the region. The 1984 field center locations are as follows: Barrow, Bethel, Dillingham, Ft. Yukon, Holy Cross, Kotzebue, Nome and Nulato.

The X-CED program offers full-time undergraduate course work for students seeking a B.Ed. degree. Off-campus delivered degree majors, minors and concentration areas are limited by faculty resources. Regions are limited to a maximum of 15-20 students per region. Applicants are reviewed and recommended by regional panels.

In addition, the program provides supplemental services, including a resource library, workshops, technical assistance and other support services as time and resources permit.

All inquiries regarding the above programs should be addressed to the field coordinator's office within the region in which the person resides, or to the X-CED Program Coordinator, Department of Education, on campus.

Admission to Teacher Education — Any student wishing to prepare for teaching through the University of Alaska-Fairbanks, must formally apply for admission to the teacher education program. Undergraduate students should consult with the head of the Department of Education, College of Human and Rural Development, at the beginning of their sophomore year to initiate procedures for formal application for admission to the teacher education program. Transfer students or post-baccalaureate students should make application the first semester of their enrollment on campus. Enrollment in education courses or admission to graduate studies in no way implies admission to the teacher education program.

Requirements

Education — B.Ed. Degree

1. Complete general university requirements as listed on page 29.
2. Complete the following degree and program (major) requirements:

	Credits
A. Communication	9
Engl. 111 — Methods of Written Communication	3
Engl. 211 — Intermediate Exposition with Modes of Literature *or*	
Engl. 213 — Intermediate Exposition	3
Sp.C. Elective	3
B. Humanities	12
Ling. 101 — Nature of Language *or*	
ANL 215 or 216 — Alaska Native Languages	3
Electives	9
(Mus. 309 and upper division American Literature recommended)	
C. Social Sciences	24
Anth. 242 — Native Cultures of Alaska	3
Hist. 131 or 132 — History of the U.S.	3
History Elective	3
P.S. 101 — Intro. to Amer. Government and Politics	3
P.S. 263 — Alaska Native Politics *or*	
ANS 310 — The Political Economics of ANCSA	3
Psy. 101 — Introduction to Psychology	3
Psy. 240 — Devel. Psychology in Cultural Perspective	3
Elective	3
D. Mathematics and Natural Science	16
For Elementary Education:	
Math. 205 — Math. for Elementary School Teachers	3
Math. Electives	6
Science Electives (including laboratory science)	7
For Secondary Education:	
Math. Electives	6
Science Electives (including laboratory science)	7
Math. or Science Elective	3
E. Education	
Ed. 201 — Introduction to Education	3
Ed. 330 — Diagnosis and Evaluation of Learning	3
Ed. 350 — Communications in Cross-Cultural Classrooms	3
Ed. 490 — Curriculum Development in Cultural Perspective	3
Education Foundation Elective	3
Med.S 201 — Factors in Health and Disease *or*	
Approved Health/Nutrition Elective	3

For Elementary Education:

Ed. 304 — Literature for Children	3
Ed. 310 — Modes of Creative Expression in Education *or*	
Mus. 309 — Elementary School Music Methods	3
Ed. 419 — Integ. Meth. in Cross-Cultural Classrooms	6
Ed. 423 — Reading, Language and Literacy	6
P.E. 327 — Movement Activity for Children *or*	
Approved Elective	2-3
Ed. 452 — Elementary Student Teaching	12

(Candidates who have taught successfully two years in the public elementary schools may petition to be excused from Ed. 452. Candidates wishing to petition for student teaching waiver should see the head of the Department of Education immediately. With approval, students may elect a rural student teaching experience. See Coordinator of Student Teaching.)

Complete one of the concentrations listed below:

Elementary Education Concentrations: Each concentration must have a minimum of 12 upper division credits. General education requirements (not including Communication requirements) may be counted toward these concentrations.

1. Humanities	24
At least 12 credits from one of the following subjects:	
Art	
English	
Music	
2. Social Sciences	36
At least 12 credits concentrated in one subject area	
3. Math and/or Science	28
At least 15 credits concentrated in math or in one natural science	
4. ESL/Applied Linguistics Endorsement	21
Engl. 318 — Modern English Grammar	3
Engl. 462 — Applied English Linguistics	3
ANS 320 — Language and Ethnicity *or*	
Anth. 204 — Language and Culture	3
6 Credits in a Language	6
AL 300 — Applied Phonology	3
AL 310 — Applied Morphology & Syntax	3
5. Alaska Native Language/Bilingual Endorsement	25-27
16-18 credits in one Alaska Native Language	16-18
ANL 387-388 — Bilingual Meth. and Materials	6
ANL 215 — Alaska Native Language *or*	
ANL 216 — Alaska Native Language	3
6. Early Childhood Development	18
12 credits of approved Early Childhood Development courses	
6 upper division credits from one of the following:	
Art — Physical Education	
English — Speech	
Music — Theater	

For Secondary Education:

Ed. 407 — Reading Strat. for Secondary Teachers	3
Ed. 424 — Small High School Programs *or*	
Ed. 425 — Community as an Educational Resource	3
Ed. 402 — Methods of Teaching in Secondary School *or*	
Approved Substitute	3
Ed. 430 — Multicultural Teaching Techniques	3
Ed. 453 — Secondary Student Teaching	12

(Candidates who have taught successfully two years in the public elementary schools may petition to be excused from Ed. 453. Candidates wishing to petition for student teaching waiver should see the head of the Department of Education immediately. With approval, students may elect a rural student teaching experience. See Coordinator of Student Teaching.)

Complete one of the interdisciplinary major/minors listed below:

1. Humanities	48
(must include a minimum of 12 upper division credits)	
Engl. 111 — Methods of Communication	3
Engl. 211 — Intermediate Exposition with Modes of Literature *or*	
Engl. 213 — Intermediate Exposition	3
English Electives	9
Journalism, Speech Communication and Theater	6
Alaska Native Languages, Foreign Languages and Literature, Linguistics	6
Alaska Native Studies (courses classified as humanities only), Art, Humanities, Music, Philosophy	9
Electives from above areas	12
2. Math./Science	45
(Must include a minimum of 12 upper division credits)	
Hum. 202 — Unity in the Sciences	3
Math. Electives (minimum 6 credits upper division)	15
Science electives (minimum 6 credits upper division)	27
A minimum of 6 credits from *each* of the following fields:	
Biology, Chemistry, Physics, Geoscience	
3. Social Sciences	48
History Electives	12
(Recommended: Hist. 101-102 — Western Civilization, Hist. 131-132 — History of the U.S.)	
Anthropology Electives	6

(Recommended: Anth 200 — Social/Cultural Anthropology, Anth 242 — Native Cultures of Alaska)
Political Science Electives 6
(Recommended: P.S. 101 — Introduction to Amer. Govt. and Politics, P.S. 263 — Alaska Native Politics)
Geography Electives 6
(Recommended: Geog. 101 — Introductory Geography or Geog. 103 — World Economic Geography, Geog. 205 — Elements of Physical Geography)
Economics Electives 6
(Recommended: Econ. 202 — Prin. of Econ. I, Econ. 201 — Prin. of Econ. II or Econ. 137 — The Alaskan Economy or Econ. 235 — Intro. to Natural Resource Economics)
Upper Division Social Science Electives 12
Selected from the following areas (minimum of 9 credits in one area): History, Anthropology, Sociology, Geography, Political Science, Economics.
Minimum Credits Required 130

Teacher Credential Endorsement — Minor in Education*
All majors in other departments who wish to obtain an Alaska teaching certificate should confer with Department of Education to obtain course requirements and application procedures for admission to the Teacher Education Program. It is essential that the student have the necessary prerequisites and be admitted to the Teacher Education Program prior to acceptance for placement in student teaching in the public schools. Students may be endorsed for secondary certification only in majors which have been approved by the Alaska Department of Education.

Elementary Credential Endorsement

	Credits
Psy. 240 — Developmental Psychology	3
Ed. 201 — Introduction to Education	3
Ed. 304 — Literature for Children	3
Ed. 330 — Diagnosis and Evaluation of Learning	3
Ed. 419 — Integrated Methods	6
Ed. 423 — Reading Language and Literacy	6
Ed. 452 — Elementary Student Teaching	12
One course from the following:	
Ed. 345 — Sociology of Education	3
Ed. 346 — Structure of American/Alaskan Education	3
Ed. 350 — Communication in Cross-Cultural Classrooms	3
Ed. 380 — Cultural Influences in Education	3
Ed. 450 — Education and Cultural Transmission	3

Secondary Credential Endorsement

Psy. 240 — Developmental Psychology	3
Ed. 201 — Introduction to Education	3
Ed. 330 — Diagnosis and Evaluation of Learning	3
Ed. 402 — Methods of Teaching (or Subject Area Methods)	3
Ed. 407 — Reading Strategies for Secondary Students	3
Ed. 424 — Small School Programs *or*	
Ed. 425 — Community as Education Resource	3
Ed. 430 — Multicultural Teaching Techniques	3
Ed. 453 — Secondary Student Teaching	12
One course from the following:	
Ed. 345 — Sociology of Education	3
Ed. 346 — Structure of American/Alaskan Education	3
Ed. 350 — Communication in Cross-Cultural Classrooms	3
Ed. 380 — Cultural Influence in Education	3
Ed. 450 — Education and Cultural Transmission	3

*A bachelor of arts degree candidate may use the credential endorsement requirements as a minor in Education.

Requirements for Admission to Student Teaching
1. Elementary School — kindergarten through eighth grade:

a. Acceptance to the teacher education program.
b. A formal application on file with the director of student teaching by October 1 for student teaching in the following spring semester and by February 15 for student teaching in the following fall semester.
c. A completed physical examination.
d. Completion of 100 credits leading to a bachelor's degree with a minimum g.p.a. of 2.00.
e. Completion of six credits in mathematics; Psy. 240, Ed. 330, 419 and 423.
f. A minimum grade of "C" in required math courses and in each education course.
g. Approval of Committee on Admission to Teacher Education to enter student teaching.
h. A maximum of 15 credits is permitted while enrolled in student teaching. These 15 credits include the 12 credits granted for student teaching.
i. Those students who meet all of the above requirements at another university must take at least 9 credits of education courses at UAF.
j. Students who feel they have experience comparable to Student Teaching must demonstrate their competence. See the department head regarding this procedure.

2. Secondary Schools — seventh through twelfth grades:

a. Acceptance to the teacher education program.
b. A formal application on file with the director of student teaching by October 1 for student teaching in the following spring semester and by February 15 for student teaching in the following fall semester.
c. A completed physical examination.
d. Completion of 100 credits leading to a bachelor's degree with a minimum g.p.a. of 2.00.
e. Completion of a minimum of 24 approved credits in an approved teaching major with a g.p.a. of 2.00 or more.
f. Completion of Psy. 240, Ed. 330, 402, 407 and 430.
g. A maximum of 15 credits is permitted while enrolled in student teaching. These 15 credits include the 12 credits granted for student teaching.
h. A minimum grade of "C" in each education course.
i. Approval of Committee on Admission to the Teacher Education Program to enter student teaching.
j. Those students who meet all of the above requirements at another university must take at least 9 credits of education courses at UAF.
k. Students who feel they have experience comparable to Student Teaching must demonstrate their competence. See the department head regarding this procedure.

3. Students who fail Student Teaching will be exited from the Teacher Education Program. Further involvement with the Teacher Education Program is dependent upon a reapplication process. See the department head regarding this procedure.

Education — B.T. Degree*
A certifiable secondary education program in the technical areas of: food services technology, aviation technology and electronics technology.

1. Complete general university requirements and B.T. degree requirements, page 29.
2. Complete the following major complex requirement beyond the associate degree major:

	Credits
A. Upper-division credit in technical specialty	0-6
B. Complementary area: Education	
Psy. 240 — Developmental Psychology	3
Ed. 201 — Introduction to Education	3
Ed. 330 — Diagnosis and Evaluation of Learning	3
Ed. 402 — Methods of Teaching in Secondary School or subject area methods course	3
Ed. 407 — Reading Strategies for Secondary Teachers	3
Ed. 424 — Small High School Programs *or*	
Ed. 425 — Community as an Educational Resource	3
Ed. 430 — Multicultural Teaching Techniques	3
Ed. 453 — Secondary Student Teaching	12
Ed. 490 — Curriculum Development in Cultural Perspective	3
Education Foundation Elective	3
3. Minimum credits required for degree	130

M.Ed. Degree
A person must make application for admission to graduate study and may be required to submit acceptable scores on a graduate entrance examination before being considered for admission to the M.Ed. program. The program offers several options from which a person selects an area of specialization. Inquiries concerning the options available and the specific requirements of each option should be directed to the head, Department of Education. In addition, the head, Department of Education should be contacted concerning the procedure to be followed in applying

for admission to graduate study and taking the graduate entrance examination.

Admission Requirements for M.Ed. Degrees:
1. The equivalent of a University of Alaska-Fairbanks bachelor of education degree or Alaska teaching certificate with a minimum of 24 credits of education courses with an average g.p.a. of 3.00.
2. One year of satisfactory teaching experience or administrative experience in public schools or appropriate experience.
3. Admission also may be contingent upon (1) satisfactory scores on various standardized tests and (2) a satisfactory personal interview conducted by Department of Education faculty members.

Minimum Degree Requirements:
1. Complete the general university requirements and master's degree requirements, pages 29 and 31.
2. Complete the following core requirement:
Ed. 601 — Critique of Educational Research Methods.....3
Ed. 602 — Pro-seminar in Applied Educational Research.....3
Ed. 610 — Education and Cultural Processes.....3
Ed. 690 — Seminar in Cross-Cultural Studies.....3
Ed. 698/699 — Project/Thesis.....6
3 credits from the following:
Psy. 670 — Advanced Cross-Cultural Psychology
Ed. 612 — Cultural and Phil. Foundations of Education
Ed. 615 — The Social Organization of Classrooms and Learning
Ed. 620 — Language, Literacy and Learning.....3
3. Complete a minimum of 15 credits from one of the following areas of specialization:
Curriculum and Instruction
Language and Literacy
Cross-Cultural Education
Educational Administration
4. The program must contain the following:
A. A minimum of 36 credits completed beyond the baccalaureate degree.
B. A minimum of 30 semester hours of course work at the 600 level.
C. A minimum of 15 credits completed on the UAF campus.
D. A minimum of 6 credits completed in a field-setting for the cross-cultural option.
E. A presentation of a synthesizing paper upon completion of the 18 credit core program.
F. A project or thesis.
G. Presentation of project or thesis results.
Note: The candidate and his/her committee will meet a minimum of three times during his/her program. The initial meeting will take place concurrently with the student achieving 12 credits of graduate study. The interim meeting will take place for the purpose of discussing and developing the synthesizing paper. The final meeting will be for the purpose of discussion of the project. Advancement to candidacy for the M.Ed. will occur after the completion of 18 credits and a satisfactory synthesizing paper.

Recommended courses in areas of specialization:
(Select 15 credits from recommended courses in one group as approved by candidate's advisory committee.)
A. Curriculum and Instruction
Ed. 612 — Cultural and Philosophical Foundations of Education
Ed. 615 — The Social Organization of Classrooms and Learning
Ed. 617 — Human Relations
Ed. 618 — Higher Education: Basic Understandings
Ed. 630 — Curriculum Theory
Ed. 631 — Small School Curriculum Design
Ed. 635 — Strategies for Cooperating Teachers
Ed. 636 — The Improvement of Elementary Teaching
Ed. 637 — Diagnosis and Correction of Reading Deficiencies
Ed. 638 — Reading Lab
Ed. 639 — Reading in Secondary Schools
Ed. 653 — Instructional Leadership in Public Schools

B. Language and Literacy
Ed. 620 — Language, Literacy and Learning
Engl. 462 — Applied English Linguistics
Engl. 472 — History of the English Language
ANS. 320 — Language and Ethnicity
Ed. 616 — Education and Socio-Economic Change
Ed. 621 — Cultural Aspects of Language Acquisition
Sp.C 425 — Communication Theory
Ling. 432 — Introduction to Syntactic Theory

C. Cross-cultural Education
ANS 475 — Alaska Native Social Change
Ed. 611 — Learning, Thinking and Perception in Cultural Perspective
Ed. 612 — Cultural and Philosophical Foundations of Education
Ed. 615 — Social Organization of Classrooms and Learning
Ed. 616 — Education and Socio-Economic Change
Ed. 620 — Language, Learning and Literacy
Ed. 621 — Cultural Aspects of Language Orientation
Ed. 630 — Curriculum Theory
Ed. 631 — Small School Curriculum Design
Ed. 645 — Small Schools Institute
Ed. 660 — Educational Administration in Cultural Perspective

D. Educational Administration
Soc. 405 — Social Change
Soc. 407 — Formal Organizations
ANS 475 — Alaska Native Social Change
Ed. 616 — Education and Socio-Economic Change
Ed. 617 — Human Relations
Ed. 618 — Higher Education: Basic Understandings
**Ed. 630 — Curriculum Theory or
**Ed. 631 — Small School Curriculum Design
**Ed. 650 — Organizational Behavior in Schools
**Ed. 651 — Large and/or Small School Management Processes
**Ed. 652 — Effective School Practices
**Ed. 653 — Instructional Leadership in Public Schools
**Ed. 654 — School Law
Ed. 655 — Public School Finance
**Ed. 660 — Educational Administration in Cultural Perspective
**Ed. 664 — Internship: Principal's Endorsement
Ed. 665 — Internship: Superintendent's Endorsement

Admission to the degree program requires three years of public school teaching experience.

(Note: As this constitutes 24 credit hours of required concentration with no electives, the M.Ed. in Administration is a 42 credit hour degree.)

D.1. *Certification, Type B Principal's Endorsement
**Ed. 630 — Curriculum Theory *or*
**Ed. 631 — Small School Curriculum Design
**Ed. 650 — Organizational Behavior in Schools
**Ed. 651 — Large and/or Small School Management
**Ed. 652 — Effective Schooling Practices
**Ed. 653 — Instructional Leadership in Public Schools
**Ed. 654 — School Law
**Ed. 660 — Educational Administration in Cultural Perspective
**Ed. 664 — Internship: Principal's Endorsement
Ed. 665 — Internship: Superintendent's Endorsement

Admission to the degree program requires three years of public school teaching experience.

*Minimum of 15 credit hours (including Ed. 660) to be completed at UAF.
**Required for certification Type B principal's endorsement.

Master of Arts in Teaching

The master of arts in teaching program is designed to serve baccalaureate graduates who qualify for the Alaska secondary school certificate, who intend to make secondary school classroom teaching their career and who wish to take additional work in their teaching major and/or minor as well as in Education. See page 31 for further information.

Ed.S. Degree

The Ed.S. degree is designed for teachers and other educators (1) who wish to undertake graduate study beyond the master's degree; (2) who wish to qualify for an intermediate degree between the master's and the doctorate; (3) who wish to develop further competence in one field of specialization.

Admission Requirements:
1. Applicants must be experienced educators who have successfully completed at least three years of professional teaching, counseling or administrative experience.
2. A master's degree is required and should be in a field which provides an appropriate foundation for the additional graduate study.
3. Admission will be contingent upon:
a. Minimum g.p.a. of 3.00 in previous graduate work

b. Acceptable scores on the Graduate Record Examination: Aptitude test and the advanced test in Education (or, permission of Admissions committee)
c. A satisfactory review conducted by admissions committee of the education department (may include a personal interview by the committee).

Degree Requirements
1. The minimum requirements will be the completion of 36 semester hours beyond the master's degree level. The student may transfer up to 9 hours from another university into her/his program.
2. Fulfillment of the requirements of the Ed.S. degree must be completed within seven years after first registering in the program.
3. Satisfactory performance on written and oral examination conducted by the Department of Education faculty is required.
4. At least 30 of the 36 semester hours must be at the graduate level (600).

Specific Course Requirements
Courses will be selected in consultation with the student's advisory committee and will depend upon the student's prior training and field of specialization. Candidates will be required to have a total background of at least 60 semester hours beyond the baccalaureate degree as outlined in the following course requirements:
1. Common core requirements for all Educational Specialist candidates (if the following courses were completed as part of a Master's program, they may not be applied toward the Education Specialist Degree.
A. Course work (12 semester hours)

	Credits
Ed. 601 — Critique of Educational Research Methods	3
Ed. 610 — Education and Cultural Processes	3
Ed. 612 — Cultural and Philosophical Foundations of Education	3
Ed. 690 — Seminar in Cross-cultural Studies (to be taken upon completion of minimum of 24 hours of graduate study)	3

B. Field Study or Internship (minimum of 6 semester hours)
Under the guidance of the student's graduate committee, each candidate will design a field research and/or internship project for a specific school district or rural area. The student will prepare the design at UAF; and, will live in the community for one semester in the internship gathering data. Each student will submit a written report on his/her findings and will defend the report and conclusion in an oral examination before his/her committee.
A research design may include the following tools of research: analysis of cumulative records, questionnaires, sociometric techniques, interviews with open-ended questions, analysis of test scores, analysis of textbooks, observation of teaching and administrative techniques, participant observation in the school and community, and rating scales.

2. Educational Specialist area of specialization and concentration (minimum of 18 semester hours).
A. Public School Administration (Public School Superintendent Credential Endorsement):
1. Admissions Requirement
Minimum of one year of shcool administration experience is required for admission to this concentration. The credential, however, can be recommended only upon completion of the prescribed Ed.S. program and three years of school administration experience.
2. The following courses are required for this specialization (may substitute equivalent graduate courses approved by candidate's committee):

	Credits
Ed. 650 — Organizational Behavior in Schools	3
Ed. 651 — Large and Small School Management Procedures	3
Ed. 652 — Effective School Practices	3
Ed. 654 — School Law	3
Ed. 655 — Public School Finance	3
Ed. 660 — Educational Administration in Cultural Perspective	3

3. Recommended courses to provide specialization depth:
ANS 430 — Alaska Native Education
ANS 475 — Alaska Native Social Changes
B.A. 651 — Organizational Behavior
Econ. 427 — Collective Bargaining
Ed. 615 — Social Organization of Classroom and Learning
Ed. 630 — Curriculum Theory
Soc. 405 — Social Change
Soc. 407 — Formal Organizations

B. Cross-cultural studies area of specialization and concentration:
1. Admissions Requirement
Applicant should have a Master's degree in an approved area of study determined by the Education Department's admissions committee. The committee may recommend provisional admittance based on applicant's eliminating deficiencies.
2. The following courses are required for this specialization (may substitute equivalent graduate courses approved by candidate's committee)

	Credits
Ed. 602 — Proseminar in Applied Educational Research Methods	3
Ed. 612 — Cultural and Philosophical Foundations of Education	3
Ed. 615 — Social Organization of Classroom and Learning	3
Ed. 620 — Language, Literacy and Learning	3
Ed. 611 — Learning, Thinking and Perception in Cultural Perspectives	3

3. Recommended courses to provide specialization depth:
ANS 430 — Alaska Native Education
ANS 475 — Alaska Native Social Change
Ed. 621 — Cultural Aspects of Language Acquisition
Ed. 630 — Curriculum Theory
Ed. 660 — Educational Administration in Cultural Perspectives
Electives: 600 level courses approved by candidate's committee

Interdisciplinary Studies — Students are encouraged to develop interdisciplinary degree programs through the Department of Education. For further information about the interdisciplinary studies program, see page 83.

Rural Development

Degree: B.A.
Minimum Requirements for Degree: 120 Credits

Faculty

Department Head and Associate Professor: Patrick J. Dubbs
Professor: Raymond J. Barnhardt
*Assistant Professor:*Nicholas Flanders
Instructor: Lary A. Schafer

The Department of Rural Development addresses rural/community issues and concerns through a variety of campus and field-delivered academic programs and services. A bachelor of arts in rural development, with a variety of emphasis areas, is the only degree option and it is available in selected locations including the Fairbanks campus.

Requirements

Rural Development — B.A. Degree
1. Complete the general university requirements and the B.A. degree requirements* page 29.
2. Complete the following program (major) requirements:

	Credits
Rural Development Core (30 credits):	
R.D. 300 — Rural Development and Rural Communities	3
R.D. 325 — Community Organization and Dev. Strategies	3
Ed. 338 — Education and Economic Development	3
R.D. 350 — Community Research and Planning	3
R.D. 400 — Rural Development Internship	3
R.D. 450 — Managing Community Development Projects	3
Ed. 470 — Human Resource Development	3
R.D. 475 — Senior Project	3
R.D. Elective	3
R.D. or Ed. Elective	3

Applied Emphasis (24 credits):

Complete a minimum of 24 elective credits (in addition to any required prerequisites) in one of the following groupings. (These elective credits can also be used to fulfill the humanities, social science, mathematics and logic, or natural science general requirements for the B.A. degree.)

Applied Land Management Emphasis
Designed for individuals interested in becoming involved in the management of village corporation lands.
A.L.R. 101 — Conservation of Natural Resources 3
A.L.R. 350 — Introduction to Forest Systems....3
A.L.R. 380 — Soils....3
A.L.R. 401 — Natural Resources Legislation....3
A.L.R. 430 — Land Use Planning....3
A.L.R. 450 — Forest Management....3
ANS 425 — Federal Indian Law and Alaska Natives....3
Biol. 104 — Natural History of Alaska 3
Biol. 271 — Principles of Ecology....4
B.A. 100 — Introduction to Data Processing and BASIC 3
Econ. 235 — Intro. to Natural Resource Economics....3
Geos. 101 and 101L — General Geology and Lab....4
Soc. 406 — Environmental Sociology 3
W.F. 302 — Fish and Wildlife Ecology and Management 2
W.F. 417 — Wildlife Management — Forest and Tundra....2
W.F. 419 — Wildlife Management — Wetlands 2
Approved electives....3 or more

Local Government Administration Emphasis
Designed for individuals interested in becoming involved in the administration of small municipal cities and/or IRA Tribal Governments.
Acct. 101 — Elementary Accounting I....3
Acct. 203 — Governmental Accounting 3
ANS 120 — Cultural Differences in Institutional Settings....3
ANS 425 — Federal Indian Law and Alaska Natives....3
ANS 475 — Alaska Native Social Change 3
Anth. 305 — Comparative Political and Legal Systems 3
B.A. 100 — Introduction to Data Processing and BASIC....3
B.A. 301 — Processes of Management 3
P.S. 101 — Intro. to American Government and Politics....3
P.S. 210 — Alaska Government and Politics....3
P.S. 212 — Introduction to Public Administration 3
Soc. 407 — Formal Organizations 3
Sp.C. 330 — Intercultural Communication....3
Sp.C. 335 — Organizational Communication....3
Approved electives....3 or more

Village Corporation Management Emphasis
Designed for individuals interested in becoming involved in the management of ANCSA village corporations and related community-based enterprises.
Acct. 101 — Elementary Accounting I....3
Acct. 102 — Elementary Accounting II....3
Anth. 306 — Economic Anthropology 3
ANS 415 — Comparative Economic Development Processes 3
ANS 425 — Federal Indian Law and Alaska Natives....3
ANS 475 — Alaska Native Social Change 3
B.A. 100 — Introduction to Data Processing and BASIC....3
B.A. 151 — Introduction to Business....3
B.A. 306 — Small Business Management 3
B.A. 331 — Business Law....3
Econ. 111 — Economics of Rural Alaska (offered only through off-campus program)....3
Econ. 137 — The Alaskan Economy....3
Sp.C. 330 — Intercultural Communication....3
Sp.C. 335 — Organizational Communication....3
Soc. 407 — Formal Organizations 3
Approved electives....3 or more

Community Information Systems Emphasis
Designed for individuals interested in becoming involved in accessing, organizing and disseminating information at the community level, particularly through community information centers.
ANS 120 — Cultural Differences in Institutional Settings....3
ANS 320 — Language and Ethnicity in Plural Societies 3
B.A. 151 — Introduction to Business....3
C.S. 101 — Computers and Man 3
Ed. 311 — Audio-Visual Methods and Materials 2
J-B 372 — Methods of Instructional Broadcasting 3
Sp.C. 330 — Intercultural Communication....3
Sp.C. 335 — Organizational Communication....3
Approved electives....3 or more

Youth Organizations
Designed for individuals who are interested in becoming involved with youth in out-of-school contexts.
Anth. 307 — Kinship and the Family 3
Ed. 220 — Culture and Learning....3
Ed. 333 — History of Childhood....3
Ed. 480 — Cultural Influences in Education....3
Psy. 101 — Introduction to Psychology....3
Psy. 210 — Cross-Cultural Psychology 3
Psy. 240 — Developmental Psychology in Cultural Perspectives....3
Soc. 201 — Social Problems 3
Soc. 242 — The Family: A Cross-Cultural Perspective 3
Sp.C. 330 — Intercultural Communication....3
Approved electives....3 or more

Minimum credits required....120

*The B.A. general degree requirements of 18 credits in any combination of courses at the 100 level or above in both humanities and social sciences, selected from at least three disciplines in each area, with a maximum of 9 credits from any one discipline must contain the following courses:

Humanities:
Engl. 414 — Research Writing 3
Social Sciences:
Anth. 242 — Native Cultures of Alaska 3
ANS 310 — Political Economy of ANCSA....3
P.S. 263 — Alaska Native Politics 3
Soc. 405 — Social Change....3

College of Liberal Arts

The purpose of the College of Liberal Arts is to educate students to recognize the possibilities and limits of the human intellect. The instructional principle of the college is the advancement of knowledge.

Undergraduate Degrees — Bachelor of arts in applied linguistics, Alaska Native studies, Yupik Eskimo, Inupiaq Eskimo, English, geography, history, humanities, interdisciplinary studies, journalism, languages, linguistics, mathematics, music, northern studies, philosophy, physical education, justice, political science, Russian studies, speech, and theater. Bachelor of music, bachelor of science in applied statistics, computer science, general science, geography, physical education and mathematics.

Graduate Degrees — Master of arts in English and music, master of arts in teaching, English, history, mathematics and music. Master of fine arts in creative writing. Master of science in computer science, general science and mathematics.

Doctor of philosophy in mathematics.

The acting dean of the college is **Jack Distad.**

Alaska Native Languages Program

Degree: B.A.
Minimum Requirements for Degree: 130 credits

There are nearly 20 different Alaska Native languages: Aleut, Alutiiq (also called Aleut or Sugpiaq), Central Yupik Eskimo, St. Lawrence Island Eskimo, Inupiaq Eskimo, Tsimshian, Haida, Tlingit, Eyak, and 11 Athabaskan languages. These languages are becoming recognized as the priceless heritage they truly are. Since the passage of the Alaska Bilingual Education Law in 1972 there has been a great demand for teachers who can speak and teach these languages in the schools throughout the state where there are Native children. Professional opportunities for those skilled in these languages are many in teaching, research, and cultural, educational, and political development.

Central Yupik Eskimo is spoken by the largest number of people, and Inupiaq by the next largest. In these two languages major and minor curricula are now offered. Courses are also regularly offered in Koyukon Athabaskan. For work in all other languages, individual or small-group instruction is offered under special topics. Thus there have frequently been instruction, seminars, and workshops also in Tlingit, Haida, St. Lawrence Island Eskimo, Aleut and Kutchin, comparative Eskimo and comparative Athabaskan.

UAF is, of course, unique in offering this curriculum, which benefits also from the research staff and library of the Alaska Native Language Center.

Faculty

Chairman and Professor: Michael E. Krauss
Assistant Professors: Steven Jacobson, Edna Maclean
Instructor: Eliza Jones

Requirements

Yupik Eskimo — B.A. Degree

1. Complete general university requirements and B.A. degree requirements, page 29.
2. Complete the following program (major) requirements:

	Credits
Esk. 101-102 — Elementary Yupik Eskimo	10
Esk. 201-202 — Intermediate Yupik Eskimo	6
Esk. 301 — Advanced Yupik Eskimo	3
Esk. 415 — Additional Topics in Advanced Yupik Eskimo	3
ANL 215 — Alaska Native Languages	3
Ling. 101 — Nature of Language or Anth. 204 — Language and Culture	3
Complete two of the following:	
ANL 387 — Bilingual Methods and Materials	3
Ling. 112 — Structure of Language	3
Anth. 242 — Native Cultures of Alaska	3
Hist. 100 — History of Alaska Natives	3
P.S. 263 — Alaska Native Politics	3
Engl. 349 — Aleut, Eskimo & Indian Literature of Alaska in English Translation	3
ANL 216 — Indian Languages of Alaska	3
A Course in Inupiaq Eskimo or other approved subject	3
Mus. 223 — Native Alaskan Music	3
ANS 320 — Language and Ethnicity	3
A.L. 300 — Applied Phonology	3
A.L. 310 — Applied Morphology and Syntax	3
A.L. 400 — Practicum	3
A.L. 450 — Policy and Planning for Alaska Native Languages	3
3. Minimum Credits Required	130

Inupiaq Eskimo — B.A. Degree

1. Complete the general university requirements and B.A. degree requirements, page 23.
2. Complete the following program (major) requirements:

	Credits
Esk. 111-112 — Elementary Inupiaq Eskimo	10
Esk. 211-212 — Intermediate Inupiaq Eskimo	6
ANL 215 — Eskimo-Aleut Languages	3
Esk. 417 — Advanced Inupiaq Eskimo	3
Ling. 101 — The Nature of Language or Anth. 204 — Language and Culture	3
Complete three of the following:	
Esk. 417 — (Additional) Adv. Inupiaq Eskimo	3
ANL 387 — Bilingual Methods and Materials	3
Ling. 112 — Structure of Language	3
Anth. 242 — Native Cultures of Alaska	3
Hist. 100 — History of Alaska Natives	3
P.S. 263 — Alaska Native Politics	3
Engl. 349 — Aleut, Eskimo and Indian Literature of Alaska in English Translation	3
ANL 216 — Indian Languages of Alaska	3
A course in Yupik Eskimo or other approved subject	3
Mus. 223 — Native Alaskan Music	3
ANS 320 — Language and Ethnicity	3
A.L. 300 — Applied Phonology	3
A.L. 310 — Applied Morphology and Syntax	3
A.L. 400 — Practicum	3
A.L. 450 — Policy and Planning for Alaska Native Languages	3
3. Minimum Credits Required	130

A minor in Alaska Native languages requires 15 credits in Eskimo or Alaska Native language courses.

Alaska Native Studies Program

Degree: B.A.
Minimum Requirements for Degree: 130 Credits

The Alaska Native studies program seeks to provide the student with (1) a keen awareness of the scope, richness, and variety of Alaskan Native cultural heritages, and (2) a series of critical perspectives on the contemporary Native experience in the plural society of North America. The student's academic program will be interdisciplinary as it is built upon a combination of appropriate courses currently offered in other specialized disciplines and of an integrated set of core courses offered by the Alaska Native studies program.

The Alaska Native studies program has been principally designed to offer a second major or a minor for many bachelor's degree candidates. It seeks students from many fields of specialization who anticipate either direct or indirect future professional involvement in Alaskan Native communities specifically and in multicultural settings generally. Only under special circumstances reviewed by the head of the program will students be advised to consider Native studies as a sole major, and they will be required to have a substantial minor in a specialized discipline.

Faculty

Department Head and Associate Professor: Michael Gaffney
Associate Professors: Anne D. Shinkwin, Jack Taylor
Assistant Professors: J. Stephen Crosby, Bart Garber, Andrew H. Hageman, Jr., Patricia Kwachka

Requirements

Alaska Native Studies — B.A. Degree
1. Complete general university requirements and B.A. degree requirements, page 29.
2. Complete the following program (major) requirements:

Prerequisites	*15 Credits*
ANL 215 — Eskimo-Aleut Languages or ANL 216 — Indian Languages of Alaska	3
ANS 120 — Cultural Differences in Institutional Settings	3
Anth. 242 — Native Cultures of Alaska	3
Hist. 100 — History of Native Alaska	3
P.S. 263 — Alaska Native Politics	3

Core Courses:	*18 Credits*
A. Complete the following required courses (9 credits):	
ANS 310 — The Political Economy of ANCSA	3
ANS 320 — Language and Ethnicity: Applications to Alaska	3
ANS 415 — Comparative Economic Development Processes: Applications for Native Alaska	3

B. Complete 9 credits of the following:

	Credits
ANS 251 — Practicum in Native Cultural Expression	1-3
ANS 301 — Native Cultural Heritage Documentation	3
ANS 375 — Native American Religion and Philosophy	3
ANS 425 — Federal Indian Law and Alaska Natives	3
ANS 430 — Alaska Native Education	3
ANS 475 — Alaska Native Social Change	3
Art 365 — Native Arts of Alaska	3
Engl. 349 — Aleut, Eskimo and Indian Literature In English Translation	3
Mus. 223 — Native Alaskan Music	3
Soc. 408 — American Minority Groups	3
3. Minimum Credits Required	130

Minor in Alaska Native Studies
A minor requires a minimum of 15 credits in Alaska Native studies. All minor programs must be approved by the head, Alaska Native studies.

Anthropology ✓

Degrees: B.A., B.S., M.A.
Minimum Requirements for Degrees: B.A. — 130 credits; B.S. — 130 credits; M.A. — 30 additional credits

The anthropology program offers a balanced and flexible program of academic courses and research opportunities in cultural anthropology, archeology, and physical anthropology, particularly with respect to the past and present cultures of the North. Anthropology contributes to an understanding of the complex problems of human behavior, cultural and social organization, and the relationship of man to the various environments. Archeological 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 in the Arctic and subarctic.

Faculty

Program Head and Associate Professor of Anthropology: W. Roger Powers
Professors: Jean Aigner, Frederick A. Milan
Associate Professors: G. Richard Scott, Anne D. Shinkwin
Assistant Professor: Joseph J. Gross

Requirements

Anthropology — B.S. or B.A. Degree
1. Complete general university requirements and B.A. or B.S. degree requirements on pages 29 and 30.
2. Complete the following program (major) requirements:

	Credits
Anth. 200 — Social/Cultural Anthropology	3
Anth. 211 — Fundamentals of Archeology	3
Anth. 222 — Human Evolution	3
Anth. 310 or 312 — New World or Old World Prehistory	3
Anth. 315 — Human Biology	3
Anth. 410 — History of Anthropology	3
Approved open program electives at 200 level or above	12
3. Minimum credits required	130

Minor in Anthropology:
A minor in anthropology requires 15 hours in anthropology, including Anthropology 101.

Anthropology — M.A. Degree
The graduate program emphasizes a basic and general preparation in the field of anthropology. Such preparation enables graduates of the program to (1) pursue more advanced training leading to the Ph.D. in anthropology, or (2) prepares them to teach anthropology within secondary education and/or undergraduate levels of higher education, or (3) prepares students for career positions with various levels of government in which some anthropological background and/or expertise is beneficial. While the basic program is oriented toward general competence, subfield specialization is possible through individual programs.

The program offers two options — a thesis track and a non-thesis track. The choice of option is guided by the student's interests and goals, the graduate advisory committee and the requirements of the university.

Degree Requirements for all graduate students:
1. A student must complete the general university requirements for the master's degree as outlined on page 31.
2. A student must pass a written examination in anthropology. Each student is expected to take the examination during the fourth semester of full graduate status regularly given according to the following schedule:
Fall semester — first week of November
Spring semester — first week of April
3. The need for a language requirement or a suitable substitute shall be determined by the student and his/her advisory committee.
4. Required courses for all graduate students enrolled in the program:

	Credits
Anth. 601 — Proseminar in Social/Cultural Anthropology	3
Anth. 611 — Proseminar in Archeology	3
Anth. 621 — Proseminar in Physical Anthropology	3

5a. Thesis Track: Core requirements outlined above to be included in a program of 30 hours study; 24 hours of which must be course work (at least 12 hours at the 600 level) plus 6 hours of thesis (Anth. 699).
5b. Non-Thesis Track: 36 hours of course work (including the core requirements), 15 hours of which must be at the 600 level as part of the 24 hours required in anthropology. A maximum of 6 hours must be devoted to research (Anth. 698).
6. At least 24 credits of the program, including thesis and/or research, must be at the 600 level.

Applied Linguistics ✓

Degree: B.A.
Minimum Requirements For Degree: 130 Credits

Applied linguistics extends the insights and theories of general linguistics to social, cultural, historical, and political concerns. Current international activities center on problems of language shift, language planning, bilingualism, translation, the preservation of minority languages, and the more traditional focus, language teaching. In addition, applied linguists play a central role in task forces dealing with the equitable delivery of legal, medical, economic, and educational services. In Alaska there is a strong need for qualified applied linguists. A central issue with which they have been asked to deal is communication in public contexts involving Alaska Native people. In some situations this communication is in English and between Alaska Natives and non-Natives. In other cases this communication is in Alaska Native languages. Thus the need is for both expertise in Alaska Native languages and in communication between Natives and non-Natives.

Faculty

Co-coordinators: Pat Kwachka, Cross-Cultural Communications, and Irene Reed, Alaska Native Language Center
Professor: Michael E. Krauss
Associate Professors: Steven Jacobson, James Kari
Assistant Professors: Lawrence Kaplan, Edna MacLean
Linguists: Eliza Jones, Jeffry Leer, Chad Thompson

Requirements

Applied Linguistics — B.A. Degree

1. Complete the general university requirements and the B.A. degree requirements as listed on page 29.

2. Complete the following foundation courses: *Credits*

Ling. 101 — Nature of Languages 3
ANS 120 — Cultural Differences in Institutional Settings 3
ANL 215 or 216 — Alaska Native Languages 3

(Foundation courses may be used to satisfy general degree requirements where applicable.)

3. Major requirements:

Core courses:
Esk. 101, 102, 201, 202 — Yup'ik Eskimo (16 credits) *or*
Esk. 111, 112, 211, 212 — Inupiaq Eskimo (16 credits) *or*
ANL 141, 142, 241, 242 — Alaska Native Lang. (12 credits) 12-16
A.L. 300 — Applied Phonology 3
A.L. 310 — Applied Morphology and Syntax 3
A.L. 400 — Practicum 3
A.L. 450 — Policy and Planning for Alaska Native Languages 3

Complete one option:

Option A — Research, Documentation and Communication:
ANS 301 — Native Cultural Heritage Documentation 3
Engl. 318 — Modern English Grammar 3
Anth. 204 — Language and Culture 3
ANS 320 — Language and Ethnicity: Applications to Alaska 3

Satisfactory completion of a language proficiency test to be administered after the Alaska Native Language sequence is completed.
(Suggested electives for this option: J-B 215 or 216; Engl. 271 or 311; Mus 223 or Engl 349.)

Option B — Bilingual Education:
Ed. 303 — Language Development, *or*
Ed. 304 — Literature for Children *or*
Ed. 315 — Elementary Methods: Classroom Management 3-6
ANL 387 or 388 — Bilingual Methods and Materials 3
Engl. 462 — Applied English Linguistics 3

Satisfactory completion of a language proficiency test to be administered after the Alaska Native Language sequence is completed.

4. Minimum Credits Required 130

Requirements for a Minor in Applied Linguistics

A.L. electives 9
Electives approved by program coordinator 6

Applied Statistics

Degree: B.S.
Minimum Requirements for Degree: 120 credits

Statistics is a collection of methods for making decisions or estimating unknown quantities from incomplete information. Statistical techniques are useful, for example, in estimating plant, animal and mineral abundances; forecasting social, political and economic trends; planning field plot experiments in agriculture; performing clinical trials in medical research; and maintaining quality control in industry. Employment opportunities are excellent for statisticians in many of these areas of application.

The curriculum for the B.S. in applied statistics provides a strong mathematics and statistics background and integrates this with an area of application. The program allows considerable flexibility in the choice of the area of application.

The applied statistics program is administered by the Department of Mathematical Sciences. In addition to the B.S. in applied Statistics, the department offers a bachelor's degree in mathematics with an emphasis in statistics. A minor in statistics is also available.

Faculty

Professor: Philip A. Van Veldhuizen
Assistant Professors: John Patrick Lambert, Dana L. Thomas, Steven K. Thompson

Requirements

Applied Statistics — B.A. Degree

1. Complete the general university requirements and B.S. degree requirements* as listed on pages 29 and 30.

2. Complete the following program (major) requirements:

A. Applied Statistics Core *44 Credits*

Math. 200, 201, 202 — Calculus 12
Math. 210 — Calculus and the Computer 1
Math. 211 — Linear Algebra and the Computer 1
Math. 314 — Linear Algebra 3
Math. 371 — Probability 3
Math. 408 — Mathematical Statistics 3
C.S. 201 — Computer Programming 3
A.S. 301 — Elementary Probability and Statistics 3
A.S. 351 — Statistical Computing Packages 2
A.S. 401 — Analysis of Experimental Design and Regression 4
A.S. 498 — Senior Project 3

Choose two of the following: *6 Credits*

A.S. 431 — Applied Nonparametric Statistics 3
A.S. 461 — Applied Multivariate Statistics 3
Math. 460 — Mathematical Modeling 3
A.S. 402 — Scientific Sampling 3
A.S., Math. or Statistical discipline oriented course approved by the Applied Statistics program chairperson 3

B. Area of Application *24 Credits*

A minimum of 24 credits, including 6 upper division, in a single discipline in which a UAF undergraduate degree is offered (excluding mathematics). Joint approval in writing is required from the department head in the area of application and the applied statistics advisor.**

3. Minimum credits required 120

*Credits received in the area of application may reduce the number of required credits in the general distribution requirements of humanities/social science and science. Engl. 312 must be completed as the second course in the written communication requirement.

**Examples of programs for areas of application for biology, wildlife, geology and economics are available. Other areas of application are available.

Minor in Statistics — See page 87.

Art

Degrees: B.A., B.F.A.
Minimum Requirements for Degrees: 130 credits

The program of the art department recognizes the responsibility of the fine arts within the humanities. Courses in art further encourage independent, original, and creative thinking.

The bachelor of fine arts is a professionally oriented degree designed to prepare students for careers in art. This degree is also the usual prerequisite for graduate studies in art. Enrollment in the B.F.A. program is recommended only for those students willing to make the considerable commitment of time and energy necessary to strive for professional competence in their major areas.

Faculty

Department Head and Professor: Ronald Senungetuk
Professors: L. Stanley Zielinski, Terence T. Choy
Associate Professors: Glen C. Simpson, Arthur William Brody
Assistant Professors: Barbara Alexander, Kesler Woodward, Catherine Zuelsdorf

Requirements

Art — B.A. Degree
1. Complete general university requirements and B.A. degree requirements, page 29.
2. Complete the following program (major) requirements:

A. Lower Division (27 credits)	*Credits*
Art 105 — Beginning Drawing	3
Art 205 — Intermediate Drawing	3
Art 161, 162 or 163 — Design and Color Theory (2 out of 3 courses)	6
Art 261-262 — History of World Art	6
Art 211 — Beginning Sculpture	3
Art 213 — Beginning Oil Painting	3
One elective chosen from:	3
Art 201 — Beginning Ceramics	
Art 207 — Beginning Printmaking	
Art 209 — Beginning Metalsmithing	

B. Upper Division (12 credits)
Nine (9) credits in upper-division courses in one subject area, selected from one of these major concentrations: 9

Drawing	Sculpture
Painting	Ceramics
Printmaking	Metalsmithing

Upper-division Art History or Humanities 332 or Art 365	3
Minimum Required Credits for major	39
3. Minimum Credits Required	130

Transfer students who are candidates for the B.A. degree or a B.F.A. in Art must complete a minimum of 18 hours of credits in art courses while in residence.

Art — B.F.A. Degree
1. Complete general university requirements and B.A. degree requirements; a non-art minor is not required for this degree.
2. Complete the following program (major) requirements:

A. Lower Division (27 Credits)	*Credits*
Art 105 — Beginning Drawing	3
Art 205 — Intermediate Drawing	3
Art 161, 162 — 2-D Design, Color and Design or Art 163 — 3-D Design (two of the three)	6
Art 261, 262 — History of World Art	6
Art 211 — Beginning Sculpture	3
Art 213 — Beginning Painting	3
One of the following	3
Art 201 — Beginning Ceramics	
or Art 207 — Beginning Printmaking	
or Art 209 — Beginning Metalsmithing	

B. Upper Division (45 Credits)

*Upper Division Art History	6
Two areas of specialization in Art:	
Major specialization	21
Minor specialization	9
Art Electives	6
Thesis Project	3
3. Minimum Credits Required	130

Major available for the B.F.A. are painting, drawing, printmaking, sculpture, ceramics, and metalsmithing.

*Humanities 332 or Art 365 may apply toward this requirement.

A minor in Art by non-art majors requires 12 credits of approved Art courses.

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

Asian Studies

Interdisciplinary Minor Program

A minor in Asian Studies provides instruction in the varieties of Asian languages and cultures through an interdisciplinary approach, and enables students to consolidate various course offerings into a meaningful and cohesive program relevant to several major fields of specialization.

Requirements

Requirements for Asian Studies Minor
Complete 15 semester credits in approved courses in Asian Studies, distributed among at least three departments, and including material on at least two Asian countries.

Asian Studies courses: Hist. 121-122, 330, 331, Geog. 311; Jpn. 101-102, 201-202; Phil. 202.

Computer Science

Degrees: B.S., M.S.
Minimum Requirements: B.S. — 120 credits; M.S. — 30 additional credits

The computer science program is administered by the Department of Mathematical Sciences within the College of Liberal Arts. Computer science is the study of information handling and its application to the problems of the world. Computing is widely used in support of activities in science, engineering, business, law, medicine, education, and the social sciences. The potential

for employment is one of the highest in the entire range of subjects spanned by the College of Liberal Arts.

Both the B.S. and M.S. degrees follow the recommendations of the Association for Computing Machinery (ACM) and the Institute for Electrical and Electronic Engineers (IEEE). The curriculum for the B.S. in computer science consists of a core of courses which introduces the student to the fundamentals of computer programming, hardware, theory, and applications. Mathematics and engineering play critical roles in the core. The student selects one of several elective packages leading to career opportunities and opportunities for further study. Throughout the curriculum the emphasis is on problem solving and applications of general principles to real-world problems. A solid background in fundamentals enables the graduate not only to understand today's computers and their uses, but also to understand and participate in future developments.

The intent of the M.S. degree in computer science is to provide breadth and depth in coursework and to culminate with a major unifying project. The program is accessible to students who have completed a B.S. in C.S. at most institutions. Students from other fields who have completed a substantive portion of a Bachelor level computer science program may be admitted to the M.S. program. In such cases, undergraduate courses may be required to remedy deficiencies.

Faculty

Program Head and Professor: Ronald W. Gatterdam
Professors: Thomas J. Head, Barbara M. Lando
Associate Professors: Mitchell Roth
Assistant Professor: Robert A. Sullivan

Requirements

Computer Science — B.S. Degree

1. Complete the general university requirements and B.S. degree requirements, pages 29 and 30.
2. Complete the following mathematics requirement: *Credits*

Math. 200 — Calculus 4
Math. 201 — Calculus 4
Math. 210 — Calculus and the Computer 1
Math. 211 — Linear Algebra and the Computer 1
Two of the following:
Math. 202 — Calculus (4 credits)
Math. 203 — Finite Math (4 credits)
Math. 307 — Discrete Mathematical Structures (3 credits)
Math. 314 — Linear Algebra (3 credits)
A.S. 301 — Elementary Probability and Statistics (3 credits) 6-8

3. Complete the following major requirements:

C.S. 201 — Computer Programming I 3
C.S. 202 — Computer Programming II 3
C.S. 301 — Computer Organization and Assembly Language 3
C.S. 311 — Data Structures and Algorithms 3
C.S. 321 — File Structure and Operation Systems 3
C.S. 331 — Programming Languages 3
E.E. 341 — Computer Organization I 4
E.E. 342 — Computer Organization II 4
Approved Elective Package 9-11

Sample Elective Packages:

Software: (Math 307, 314) C.S. 401 and two courses from the following: C.S. 381, 405, 411, 425, 442, 621, 631.
Hardware: (Math 202, 314) C.S. 448, E.E. 442 and one of the following: C.S. 442, 621, E.E. 443.
Theory: (Math 307, 314) Math 308, C.S. 451, C.S. 651.
Math. (Applied): (Math 202, 314) Math 302, 421, and 310 or 422.
Math. (Modeling): (Math 202, A.S. 301) Math 371, 460 and one of the following: Math. 408, A.S. 401, 402.
Business: (Math 203, A.S. 301) B.A. 201, 310, Acct. 316.
4. Total Credits Required 120

Minor in Computer Science

C.S. 201 — Computer Programming I 3
C.S. 202 — Computer Programming II 3
C.S. 301 — Computer Organization and Assembly Language 3
C.S. 311 — Data Structures and Algorithms or
C.S. 321 — File Structure and Operating Systems 3
Elective selected from the following:
Any C.S. course (except C.S. 101) or
Math 210 and Math 211 — Calculus/Linear Algebra & Computer or
E.E. 341 — Computer Organization I or
B.A. 201 — COBOL or
B.A. 310 — Management Information Systems or
Acct 316 — Accounting Information Systems or
Other elective approved by advisor 2-3

Computer Science — M.S. Degree

1. Complete the general university requirements and graduate degree requirements, pages 29 and 31.
2. Complete the following program (major) requirements:

30 Credits

C.S. 411 — Analysis of Algorithms or
C.S. 611 — Complexity of Algorithms *3*
C.S. 631 — Programming Language Implementation *3*
C.S. 448 — System Architecture or
C.S. 641 — Advanced Systems Architecture *3*
C.S. 451 — Automata and Formal Languages or
C.S. 651 — The Theory of Computation *3*
Advisor approved electives *12*
C.S. 690-691 — Graduate Seminar and Project *6*

Not more than 6 credits may be taken at the 400 level.

3. Upon completion of core course work, the candidate must pass an oral examination based on the core material.

Cross-Cultural Communications

Recognizing that the transition to university communications patterns often presents challenges which vary in type as well as degree, depending on a student's cultural background, CCC offers several courses designed to capitalize on the similarities of experience brought to the university by Alaska Native and rural students. It aims to enable such students to make the transition more quickly than might otherwise be the case.

Faculty

Department Head and Assistant Professor: Ann Frentzen
Assistant Professor: Pat Kwachka, Roland Wulbert
Instructors: Charlotte Basham, Linda Nichols, Tina Parke-Sutherland.

English

Degrees: B.A., M.A., M.F.A., M.A.T.
Minimum Requirements for Degrees: B.A. — 130 credits; M.A. — 30 additional credits; M.F.A. — 45 additional credits; M.A.T. — 36 additional credits

The work of the Department of English includes the two functions traditionally associated with the discipline — teaching basic and advanced courses in written composition and offering survey and advanced courses in English, American and world literature both to English majors and minors and to students in other fields who may choose the courses as electives. In addition, the department offers courses in English linguistics and Alaskan literature.

The department also offers several programs of graduate study, including work in research and scholarship, original writing and preparation for teaching English.

Faculty

Department Head and Associate Professor: Frank Buske
Professors: John W. Bernet, June Duncan
Associate Professors: Mary Baron, Alice Harris, John Morgan, David Stark, Russell Stratton, Russell Tabbert, Cynthia Walker
Assistant Professors: Joseph A. Dupras, LeRoy Perkins, Michael Schuldiner

Requirements

English — B.A. Degree
A. Emphasis: Literature
1. Complete the general university requirements and B.A. degree requirements, page 29.
2. Complete the following program (major) requirements: 36 credits in English besides Engl. 111 and Engl. 211 or 213, including:

Credits

a. Engl. 301 — Continental Literature in Translation: From the Ancient World through the Renaissance 3
Engl. 310 — Literary Criticism 3
b. One course chosen from each of the following sequences:

American Literature:
Engl. 306 — Survey of American Literature: From the Colonial Period to the Civil War
or Engl. 307 — Survey of American Literature: From the Civil War to the Present 3

British Literature:
Engl. 308 — Survey of British Literature: Beowulf to the Romantic Period
or Engl. 309 — Survey of British Literature: Romantic Period to the Present 3

Periods of British and American Literature:
Engl. 403 — American Writers of the 19th Century: Romantic Period
or Engl. 404 — American Writers of the 19th Century: Rise of Realism
or Engl. 405 — British Writers of the 19th Century: Romantic Period
or Engl. 406 — British Writers of the 19th Century: Victorian Period
or Engl. 407 — English Writers of the 18th Century: Restoration and Neo-Classical Period
or Engl. 408 — American Writers of the Colonial and Federal Periods 3

c. Engl. 422 or 425 — Shakespeare 3

d. One course from the following:
Engl. 421 — Chaucer *or* Engl. 426 — Milton 3

e. One course from the following:
Engl. 318 — Modern English Grammar, Engl. 462 — Applied English Linguistics
or Engl. 472 — History of the English Language 3

f. Four courses chosen from 300-400 levels in English with at least two courses on 400 level 12
3. Minimum Credits Required 130

B. Emphasis: Forms and Techniques of Writing
1. Complete the general university requirements and B.A. degree requirements, page 29.
2. Complete the following program (major) requirements: 36 credits in English besides Engl. 111 and Engl. 211 or 213, including:

Credits

a, b, and c as listed in the requirements for a major with emphasis on literature 18

d. Two courses from the following:
Engl. 445 — 20th Century Drama: From Chekhov to Ionesco
or Engl. 446 — 20th Century British and American Poetry
or Engl. 452 — The British Novel to 1900
or Engl. 448 — 20th Century American Literature, Exclusive of Poetry
or Engl. 447 — 20th Century British Literature, Exclusive of Poetry
or Engl. 449 — American Fiction to 1900 6

e. Two courses from the following:
Eng. 481 — Craft of Poetry
or Engl. 482 — Craft of Fiction
or Engl. 483 — Craft of Drama
or Engl. 484 — Craft of Non-Fiction Prose 6
f. Two courses chosen from 300-400 level English Department Writing Courses 6
3. Minimum Credits Required 130

C. Emphasis: Teaching
1. Complete the general university requirements and B.A. degree requirements, page 29.
2. Complete the following program (major) requirements: 36 credits in English besides Engl. 111 and Engl. 211, including:

Credits

a. Same as listed under (a) for literature emphasis 6
b. One course from each of the following sequences
American Literature
Engl. 306 — Survey of American Literature: From the Colonial Period to the Civil War *or*
Engl. 307 — Survey of American Literature: From the Civil War to the Present 3
British Literature
Engl. 308 — Survey of British Literature: Beowulf to the Romantic Period *or*
Engl. 309 — Survey of British Literature: Romantic Period to the Present 3
c. Same as listed under (c) for literature emphasis.
d. Same as listed under (d) for literature emphasis.
e. Engl. 318 — Modern English Grammar 3
Engl. 472 — History of the English Language 3
f. Two courses from the following 6
Engl. 311 — Advanced Exposition (3 credits)
Engl. 484 — Craft of Non-fiction Prose (3 credits)
Approved 300-level English Elective (3 credits)
g. Two elective courses from the following 6
All 300-level English courses, Engl. 445, 446, 447, 448, 449, 462, 481, 482 or 483.
3. Minimum Credits Required 130

Requirements for a minor in English:
Complete 21 credits in English besides Engl. 111 and Engl. 211 or 213, including:

a, b, and c as listed in the requirements for a major with emphasis on literature 18
d. One 400-level English course 3

English — M.A. Degree
1. Complete the general university requirements and master's degree requirements, pages 29 and 31.
2. Complete a minimum of 30 approved credits on the 600 level, distributed as follows:

	Credits
Engl. 601 — Bibliography, Meth., and Criticism	3
Six courses in English chosen in consultation with and approved by the graduate committee	18
(Extra course required if student does not take Engl. 685).	
Engl. 685 — Teaching College Composition (if a graduate assistant or planning to teach)	3
Engl. 699 — Thesis	6

3. Advancement to candidacy will be based upon finding by student's advisory committee that student has made satisfactory progress toward completion of the degree.
4. Pass a comprehensive examination based on a standardized reading list; examination to be taken no later than student's third semester of work.

English — M.A.T. Degree
1. Complete the general university requirements and master's degree requirements, pages 29 and 31.
2. Complete a minimum of 36 approved credits including at least 15 in English taken at the University of Alaska-Fairbanks. At least 24 credits must be at the 600 level.

This degree is designed to serve the baccalaureate graduate who has qualified or who can qualify for the Alaska secondary school certificate; who intends to make secondary school classroom teaching a career; and who wishes to take additional work in English as well as in education. A student's graduate committee will assist in planning a program.
3. Pass a qualifying examination before advancement to candidacy and in order to remain in good standing. The examination will normally be taken during the second semester of graduate study. A student who fails may be permitted to take the qualifying examination again, depending on the nature of the failure.

Creative Writing — M.F.A. Degree
1. Complete the general university requirements and master's degree requirements, pages 29 and 31.
2. Complete a minimum of 45 approved credits at the 600 level, except as noted under 2.f, distributed as follows:

	Credits
a. Engl. 671 — Writers' Workshop	9
b Engl. 601 — Bibliography, Meth., and Criticism	3
c. Engl. 685 — Teaching College Composition (if a graduate assistant or planning to teach)	3
d. One form course	3
Engl. 681 — Forms of Poetry	
Engl. 682 — Forms of Fiction	
Engl. 683 — Forms of Drama	
Engl. 684 — Forms of Non-Fiction Prose	
e. Literature seminars (minimum of four; to be determined by student's advisory committee)	12
f. Electives (to be approved by student's advisory committee; courses may be at 400 level if in another discipline)	9
Engl. 699 — Thesis	6

3. Advancement to candidacy will be based upon finding by student's advisory committee that student has made satisfactory progress in both academic and writing areas.
4. Pass a comprehensive examination, based on a standardized reading list; examination to be taken no later than student's fourth semester of work.

Geography

Degrees: B.A., B.S.
Minimum Requirements for Degrees: B.A. — 130 credits; B.S. — 130 credits

The department offers undergraduate courses and degrees in geography and in geography and regional development. Geography provides an organized picture of the earth as a whole and of its interrelated regions and activities. It deals both with the natural resources of the earth and with man's use of them. Its methodology includes the observation, measurement, description, and analysis of places or areas — their likenesses, differences, interdependence and significance. Geography serves as a bridge between the physical sciences and the social sciences. At UAF, geography is offered as: (a) part of a broad cultural background in a liberal arts curriculum; (b) part of a comprehensive program in biological and earth sciences; (c) background for studies in economics, history, political science, and other social sciences; (d) preparation for teaching geography, earth science, or social science in elementary or secondary schools; (e) technical training for professional geographic work in government, business or industry; (f) preparation for further graduate study in geography, regional planning and related disciplines. Students majoring in geography may elect such advanced work in this and other departments as will provide a concentration either in physical science or in social science.

Faculty

Department Head and Professor: Donald F. Lynch
Associate Professor: Roger W. Pearson

Requirements

Geography — B.A. Degree
1. Complete the general university requirements and B.A. degree requirements, page 29.
2. Complete the following program (major) requirements:

A. Complete 24 credits in geography, including the following: Geog. 101 or 103; 205; 202 or 302; 339 or 401; 305 or 311; 306 or 327; 492; geography elective.

B. Complete 20 credits of the following or approved alternative courses with groupings to emphasize cultural, economic, physical, or regional geography. (Can also be used to meet basic degree requirements and to apply toward minor requirements.):

Cultural Geography
Anthropology 101, 205, 206, 242, 321, 428
Sociology 250, 307, 309, 363, 406
Economic Geography
Economics 201, 235, 335, 437, 463
Physical Geography
Geosciences 101, 112, 261, 304, 407, 408, 422
Biology 271
Agriculture and Land Resources 101, 350, 380, 430
Regional Geography
History 261, 315, 316, 331, 341, 344, 350, 450
Political Science 201, 315, 321, 322, 415, 435, 436, 480

C. Approved electives to complete 130 credits.

Geography — B.S. Degree
1. Complete general university requirements and B.S. degree requirements, pages 29 and 30.
2. Complete the following program (major) requirements:
A. Complete 12 credits in approved mathematics courses.
B. Complete two minors.
C. Complete the requirements A, B, and C as stated above for the B.A. degree with emphasis in either economic or physical geography.

Geography and Regional Development — B.A. Degree
1. Complete the general university requirements and B.A. degree requirements listed on page 29.
2. Complete the following program (major) requirements:

A. Complete 36 credits in the following core courses:
Geography 103, 205, 301, 404, 492
Economics 235 or 324, 335

Biology 271
Agriculture and Land Resources 101
Political Science 211, 301

B. Complete 6 credits from each of the following five (5) groups (30 credits):
1. Geography 202, 302, 311, 327
2. History 341, 440, 450
3. Sociology 201, 307, 309
4. Geosciences 101, 112, 304, 408
5. Agriculture and Land Resources 380, 460
Wildlife and Fisheries 333

C. Approved electives to complete 130 credits

Minor in Geography:

A minor in geography requires 15 credits in geography including Geography 101 or 103 and 205.

History

Degrees: B.A., M.A.T.
Minimum Requirements for Degrees: B.A. — 130 credits; M.A.T. — 36 additional credits

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

The department also trains the student in applying the historical method which offers analysis based on the dimension of time. Discussion, focused on concrete, specific events, persons and judgments explains why things are as they are. Students will learn effective historical research and writing.

Through the study of history, students may prepare for careers in public service agencies; as members of management teams, particularly in the area of policy analysis; for careers in teaching, or for advanced work in history and other social sciences.

Faculty

Department Head and Associate Professor: Peter Cornwall
Professor: Clause Naske
Associate Professor: John Whitehead
Assistant Professor: Carol Gold

Requirements

History — B.A. Degree
1. Complete general university and B.A. degree requirements, page 29.
2. Complete the following program (major) requirements:

Complete any four of the following:	*Credits*
Hist. 101-102 — Western Civilization	6
Hist. 121-122 — East Asian Civilization	6
Hist. 131-132 — History of the U.S.	6
Complete 21 upper-division credits in history, including:	
Hist. 475-476 — Historiography and Intro. to Historical Method	6
3. Minimum credits required	130

History — M.A.T. Degree

Refer to general requirements for M.A.T. degree on page 31. Persons interested in this degree program should contact the head of the department.

Minor in History:

A minor in history requires the completion of 18 credits in history, six of which must be at the 300 level or above.

Humanities

Degree: B.A.
Minimum Requirements for Degree: 130 credits

One main objective of the humanities program is to enable the student to go beyond specialization and achieve integration of knowledge. Others are to deepen an appreciation of all the arts, to develop critical thinking, and to heighten an awareness of self and role in society.

The humanities program is set up in such a way as to offer a solid second major for many bachelor of arts and bachelor of science degree candidates. It aims at students from virtually all fields of specialization.

Requirements

Humanities — B.A. Degree
1. Complete the general university requirements and B.A. degree requirements, page 29.
2. Complete two years at the college level in a non-English language.
3. Complete the following program (major) requirements:

Prerequisites:	*Credits*
Hist. 101-102 — Western Civilization	6
Ling. 101 — The Nature of Language *or* Ling. 216 — Languages of the World	3
Phil. 201 — Introduction of Philosophy *or* Phil 202 — Introduction to Eastern Philosophy	3
Complete the following core courses:	
Hum. 201 — Unity in the Arts	3
Hum. 202 — Unity in the Sciences	3
Hum. 329 — The Modern Media	3
Hum. 332 — Varieties of Visual Expression	3
Hum. 342 — Synthesis in Musical Expression	3
Hum. 411 — Dimensions of Literature	3
Phil. 481 — Philosophy of Science	3
Hum. 492 — Senior Seminar	3
Electives:	*21 credits*

Courses chosen from the three major areas: arts, natural sciences, social sciences; three courses to be taken in one of these areas, and two in each of the remaining ones, totaling 21 credits. A list of recommended courses, drawn up and periodically updated by the Humanities Standing Committee after consultation with all departments in all colleges that wish to cooperate, will assist the student in making the choice of electives.

4. Minimum credits required 130

Minor in Humanities:

Prerequisites:	*Credits*
Hist. 101-102 — Western Civilization	6
Core Courses:	
Hum. 201 — Unity in the Arts	3
Hum. 202 — Unity in the Sciences	3
Upper-division Humanities electives	12

Interdisciplinary Studies

Degrees: B.A., B.S.
Minimum Requirements for Degrees: B.A. — 130 credits; B.S. — 130 credits

The exceptional student with well-defined goals which do not fit into the established bachelor's program of the university should have an opportunity to achieve baccalaureate recognition for carrying out an approved interdisciplinary program which approximates the requirements for a baccalaureate degree in an established discipline. For this purpose the bachelor of arts or bachelor of science degree in interdisciplinary studies is offered.

Upon completion of 15 credits at UAF and at least 60 credits prior to graduation, a student may submit to the chancellor, or his designated representative, an interdisciplinary curriculum leading to a B.A. or B.S. degree in interdisciplinary studies. The proposed curriculum must differ significantly from established degree programs at UAF and will require evidence that the necessary facilities and faculty are available to ensure an approximation of a normal bachelor's degree. All general requirements for the B.A. or B.S. degree must be met.

The chancellor will appoint to review the proposal a committee of at least three faculty members familiar with the interdisciplinary subject. If the curriculum is approved by the chancellor, he will, in consultation with the student, appoint an advisory committee of at least three faculty members to assist the student in planning and carrying out his program. The degree title will be chosen by the advisory committee in concert with the student and with the approval of the chancellor. Changes within the approved curriculum would be made only with the approval of this advisory committee.

Journalism and Broadcasting

Degree: B.A.
Minimum Requirements for Degree: 130 credits

The curriculum in journalism and broadcasting is designed to prepare students for a challenging profession which calls for a high degree of proficiency in communicating with words and pictures for the print and broadcast media, while being versatile enough to provide a broad liberal arts education.

Students in the department gain valuable practical experience by working on the Sun-Star, the campus newspaper, on Alaska Today magazine, at KUAC-TV and KUAC-FM, both situated on campus, and through internships at other media.

The department also provides excellent facilities for learning, including a modern photography lab, typography lab, audio production lab and video production equipment.

Faculty

Department Head and Associate Professor: George M. Winford
Associate Professors: Dean M. Gottehrer, Gerald E. Weaver
Assistant Professors: Patrick J. Daley, David W. McCarty

Requirements

Journalism — B.A. Degree

1. Complete the general university requirements and B.A. degree requirements, page 29.

2. Complete the following program (major) requirements:

A. Complete the following courses in journalism:

	15 Credits
J-B 101 — Introduction to Mass Communications or J-B 102 — Broadcasting and Society	3
J-B 301 — Basic Newsgathering and Processing	4
J-B 320 — Journalism in Perspective	3
J-B 400 — Media Practicum	2
J-B 413 — Mass Media Law and Regulations	3

B. Complete one of the following sequences:

News-Editorial	*18 Credits*
J-B 444 — Advanced Newsgathering and Processing	4
One of the following:	
J-B 204 — Basic Photojournalism	3
J-B 215 — Audio Production	3
J-B 316 — Television Production	3
Four of the following:	
J-B 204 — Basic Photojournalism	3
J-B 303 — Intermediate Photography	3
J-B 311 — Magazine Article Writing	3
J-B 323 — Magazine Editing	3
J-B 324 — Typography and Publication Design	3
*J-B 326 — Principles of Advertising	3
J-B 402 — Advanced Photography	3
J-B 411 — Advanced Magazine Article Writing	3
J-B 420 — Book Writing	3
J-B 424 — Magazine Production	3
J-B 433 — Public Relations	3
J-B 492 — Seminar	2 or 3

**Broadcast*	*18 Credits*
J-B 215 — Audio Production	3
J-B 316 — Television Production	3
Four of the following:	
J-B 204 — Basic Photojournalism	3
J-B 317 — Broadcast Journalism	3
*J-B 326 — Principles of Advertising	3
J-B 372 — Instructional Television	3
J-B 407 — Programming and Production	3
J-B 415 — Videography	3
J-B 416 — Advanced Broadcast Production	3
J-B 433 — Public Relations	3
J-B 492 — Seminar	2 or 3

C. Complete at least 3 credits in each of the following areas:
Economics Sociology
Political Science History
Psychology

D. Although not required, it is strongly recommended that every journalism student study another language, both to help gain a better perspective of English and to better comprehend the changing world.

E. To assure the journalist of a broad liberal arts education, no more than 33 hours in journalism and broadcasting courses may be included in the 130 hours required for the B.A. degree.

3. Minimum credits required 130

*Cross-listed with B.A. 326, Principles of Advertising.

**Note:* It should be understood that this broadcast option is primarily a news and production curriculum and is not intended as a dramatic or performing arts option.

Minor in Journalism and Broadcasting:

Complete at least 16 credits of approved journalism and/or broadcasting courses, including the following:

	Credits
J-B 101 — Introduction to Mass Communications or J-B 102 — Broadcasting and Society	3
J-B 301 — Basic Newsgathering and Processing	4

Justice

Degree: B.A.
Minimum Requirements for Degree: B.A. — 130 credits

It has been said that the quality of a nation's civilization can be largely measured by the methods it uses to enforce its criminal law.

We in the United States deal with our criminals through a complex maze of organizations commonly referred to as the criminal justice system. This system is composed of police, courts, corrections and a multitude of supportive professions which are more or less actively engaged in dealing with criminals within the guidelines of our federal and state constitutions.

Only through an active educational effort by criminal justice personnel and students planning to enter the profession can we hope to attain the high degree of professionalization so necessary to create and maintain a criminal justice system which will mirror our otherwise advanced civilization.

Faculty

Director and Assistant Professor: Kendall Stockholm
Associate Professors: Gary Copus, Andrea Helms
Instructor: Carl Shepro
Assistant Professor: Marc Stier

Requirements

Justice — B.A. Degree
1. Complete the general university requirements and general requirements for the B.A. degree, page 29.
Electives chosen to fulfill the general requirements for the B.A. degree must be approved in advance by the director of the justice program.
2. Complete the following program (major) requirements:

	Credits
Justice Core Course Requirements	21
Just. 110 — Introduction to Justice	3
Just. 221 — Justice Organization and Management	3
Just. 250 — Development of Law	3
Just. 251 — Criminology	3
Just. 330 — Justice and Society	3
Just. 451 — Research, Planning and Policy Analysis	3
Just. 460 — Justice Processes	3

Justice Emphasis Area Requirements:
15 credits in justice courses of which at least 12 credits must be upper division. Possible special emphasis areas might include:

Justice Administration	Security Administration
Corrections	General Justice
Legal Studies	

3. Minimum credits required	130

Minor in Justice:
1. Complete 18 credits in justice, including Just. 110, 9 of which must be upper division.

Library Science

In this age of dramatic increases in recorded knowledge, it is crucial that students make effective use of information for their course work in all fields and for their lifelong learning needs. The expanding library science program addresses these needs by teaching the principles of information organization used in libraries. In addition these courses present strategies for accessing information, study and analysis of specific resources for scholarly research and communication, and an examination of developing information philosophies and technologies. As demand warrants, special topics, courses and individual studies also are offered.

Faculty

Program Head and Assistant Professor: Rheba A. Dupras
Professor: Paul McCarthy
Associate Professors: Edmund S. Cridge, David A. Hales, Thomas J. Hassler, Sharon M. West, Marvin Falk
Assistant Professors: Pauline Gunter, Tamara P.K. Lincoln, M. Diane Raines, Dennis J. Stephens, C. Eugene West, Bill Schneider
Instructor: Brenda S. Artman

Linguistics and Foreign Languages

Degree: B.A.
Minimum Requirements for Degree: B.A. — 130 credits

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

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

Faculty

Department Head and Professor: Wolf Hollerbach
Professor: John Koo
Assistant Professors: Serge Lecomte, Victoria J. Moessner, Nijole Rukas

Requirements

Foreign Language — B.A. Degree
1. Complete the general university requirements as listed on page 29.
2. Complete the B.A. degree requirements as listed on page 29.
3. Complete the following program (major) requirements:

	Credits
I. Background-related Requirements	24
Option A Liberal Arts Option	
a. Ling. 101 — Nature of Language	3
Hum. 201 — Unity in the Arts	3
Hum. 202 — Unity in the Sciences	3

Hum. 411 — Dimensions of Literature 3
b. 6 credits in literature courses other than those of the field of specialization 6
c. 6 credits from among the following:
Phil. 201 — Introduction to Philosophy 3
Hist. 101, 102 — Western Civilization 3
Hist. 315 — Europe 1914-1945 3
Art 261 or 262 — History of World Art 3
Geog. 305 — Geography of Europe (except U.S.S.R.) 3
Geog. 402 — Man and Nature 3

Option B (Career-oriented Option)
a. Ling. 101 The Nature of Language 3
b. 21 credits in major-related courses in other disciplines, such as business, education, journalism, political science, etc. (to be specified by the advisor according to the student's career preferences) 21

II. Major Requirements (two languages required) First Language (French, German or Spanish) (above 100 level) 24

Complete the following courses:
201 — 3 credits 387 — 2 credits
202 — 3 credits 432 — 3 credits
288 — 2 credits 487 — 2 credits
301 — 3 credits 488 — 3 credits
303 — 3 credits
Second Language (French, German, Russian or Spanish) (above 100 level) 13
Complete the following courses:
201 — 3 credits 301 — 3 credits
202 — 3 credits *or* 303 — 3 credits
288 — 2 credits 387 — 2 credits

Where appropriate, courses listed under I and II may be counted toward fulfillment of B.A. requirements listed under 2.

4. Minimum credits required 130

A minor in a foreign language requires 12-21 credits. If all are at the 200 level or higher, 12 credits will fulfill this requirement.

Linguistics — B.A. Degree
1. Complete the general university requirements as listed on page 29.
2. Complete the B.A. degree requirements as listed on page 29.
3. Complete the following program (major) requirements:

Credits

I. Background-related requirements 27
a. Hum. 201-202 — Unity in the Arts/Unity in the Sciences 6
Phil. 204 — Introduction to Logic or 3
Phil. 341 — Epistemology 3
b. Complete a minimum of 12 credits in one foreign language 12
c. Complete one of the following:
Hum. 411 — Dimensions of Literature 3
A.S. 301 — Elementary Probability and Statistics 3
A.S. 402 — Scientific Sampling 3

II. Major Requirements 27-31
Complete the following Linguistics courses:
a. Ling. 101 — Nature of Language 3
Ling 216 — Languages of the World 3
b. 2 upper-division courses in Linguistics 6
c. Ling. 488 — Individual Study: Senior Project 3
d. Engl. 318 — Modern English Grammar 3
Engl 472 — History of the English Language 3
e. Esk. 101 and 102 — Elementary Yup'ik Eskimo or 10
Esk. 111 and 112 — Elementary Inupiaq Eskimo or 10
A.N.L. 215 and 216 — Alaska Native Languages 6

Where appropriate, courses listed under I and II may be counted toward fulfillment of B.A. requirements listed under 2.

4. Minimum credits required 130

Minor in Linguistics:

A minor in linguistics requires 12 credits in linguistics.

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

Mathematics

Degrees: B.A., B.S., M.A.T., M.S., Ph.D.
Minimum Requirements for Degrees: B.A. — 120 credits; B.S. — 120 credits; M.A.T. — 36 additional credits; M.S. — 30 additional credits.

The number of new fields in which professional mathematicians find employment grows continually. The department offers a variety of programs for students majoring in mathematics. Options exist for those who are planning careers in industry, government, or education. The Department of Mathematical Sciences also administers a degree program in computer science.

In addition to the major programs, the department provides a number of service courses for the various units of the university. Current and detailed information on mathematics degrees and course offerings is available from the department.

Faculty

Applied Statistics
Professor: Philip A. Van Veldhuizen
Assistant Professors: John Patrick Lambert, Dana Thomas, Steven Thompson
Computer Science
Professors: Ronald Gatterdam, Thomas Head, Barbara Lando
Associate Professor: Mitchell Roth
Assistant Professors: Marguerite Hafen, Robert Sullivan
Mathematics
Department Head and Professor: Ronald W. Gatterdam
Professors: Jack Distad, Gary Gislason, Thomas Head, Barbara Lando, Philip Van Veldhuizen
Associate Professors: Patricia Andresen, Clifton Lando, Robert Piacenza, Walter Tape
Assistant Professors: James Burnham, John P. Lambert, Susan Royer, Robert Sullivan
Instructors: Elaine Ensign, Martin Getz, Margaret Morris

Requirements

Degree Requirements
In addition to meeting all the general requirements for the specific degree, certain mathematics courses are required of all mathematics majors. (At least 12 approved mathematics credits at the 300 level or above must be taken while in residence on the Fairbanks campus.) All electives must be approved by the department. (All mathematics majors — including double majors — must have an adviser from the Department of Mathematical Sciences.) Students preparing to teach mathematics in secondary schools should contact the Department of Education for a list of mathematics and education courses necessary to obtain an Alaskan teaching certificate.

Mathematics — B.A. or B.S. Degree
1. Complete the general university requirements and requirements for a B.A. or B.S. degree, pages 29 and 30.
2. Complete the following program (major) requirements:
Complete the following courses:

Math. 200, 201, 202 — Calculus sequence	12
Math. 210 — Calculus and the Computer	1
Math. 211 — Linear Algebra and the Computer	1
Math. 314 — Linear Algebra	3
Math. 308 — Abstract Algebra	3
Math. 401 — Advanced Calculus	3
Math. 492 — Senior Seminar	2
TOTAL	25

Complete an elective package in the Mathematical Sciences consisting of at least 18 credits. This package must be approved by a Mathematical Sciences adviser and must include at least 12 credits at the 300-level or above. Students who are obtaining a single B.S. or B.A. with mathematics as a second major may substitute up to 9 credits of approved courses with strong mathematical content for Mathematical Sciences electives.

3. Minimum credits required 120

The following sample elective packages are suggested for students with interests in the indicated areas of emphasis.

A. Pure Math

Math. 305 — Geometry	3
Math. 307 — Discrete Mathematical Structures	3
Math. 402 — Advanced Calculus	3
Math. 404 — Topology	3
Approved Math elective	6
TOTAL	18

B. Applied Math

Math. 302 — Differential Equations	3
Math. 421 — Applied Analysis I	4
Math. 422 — Applied Analysis II	4
Math. 460 — Mathematical Modeling	3
Two courses chosen from Math 307, 402, 310 and A.S. 301	6
TOTAL	20

C. Secondary Education

A.S. 301 — Elementary Probability and Statistics	3
Math. 305 — Geometry	3
C.S. 201 — Computer Programming I	3
Math. 402 or Math 460	3
Approved Math elective	6
TOTAL	18

D. Statistics Emphasis

Math. 371 — Probability	3
Math. 408 — Mathematical Statistics	3
Math. 460 — Mathematical Modeling	3
A.S. 301 — Elementary Probability and Statistics	3
A.S. 401 — Experimental Design & Regression	3
Approved elective	3
TOTAL	18

Minor in Mathematics:
A minor in Mathematics requires completion of Math 200-201-202, 210, 211 in addition to six departmentally approved credits at the-300 level or above.

Minor in Statistics:
Complete the following:

A.S. 301 — Elementary Probability and Statistics	3
A.S. 401 — Experimental Design and Regression	3
Math. 371* — Probability	3
Math. 408 — Mathematical Statistics	3
Approved credits	3

(Examples: Any other A.S. course; statistics related courses such as B.A. 360, B.A. 684, Geos. 430, Econ. 326, Anth. 421, etc.)

*Math. 371 requires Math. 200-201-202 as prerequisites.

(A minor in statistics may be used with a major in mathematics as long as there is no double-counting of courses in both the major and minor.)

Mathematics — M.A.T. Degree
1. Complete the general university requirements and master's degree requirements, pages 29 and 31.
2. Complete 36 credits in courses approved by the student's graduate committee. At least 24 credits, including thesis and/or research, must be at the 600 level.

Mathematics — M.S. Degree
1. Complete the general university requirements and master's degree requirements, pages 29 and 31.
2. Complete 30 credits in courses approved by the student's graduate committee. At least 24 credits, including thesis and/or research, must be at the 600 level.
3. Complete a final examination, including a demonstration of proficiency in mathematics at the graduate level. The means of such demonstration will be determined by the candidate and his/her graduate committee.

Mathematics — Ph.D. Degree

1. Complete the general university requirements and Ph.D. requirements, pages 29 and 34.
2. Complete the required program as arranged by conference with the candidate's graduate advisory committee.

Military Science

The Army Reserve Officers' Training Program is a cooperative effort agreed to by the Army and UAF as a means of providing junior officer leadership in the interest of national security. The goal of the program is to assist young men and women with leadership potential in obtaining commissions in the Army Reserve, National Guard or Regular Army.

The program of instruction is designed to complement the student's goal of obtaining a bachelor's degree in a course of study of his/her own choosing. Through academic instruction and practical experience laboratories, the student becomes familiar with the leadership, management and decision-making qualities necessary for the Army officer and civilian executive.

ROTC is divided into the basic course for freshmen and sophomores and the advanced course for juniors and seniors. Programs and courses can be adjusted to meet specific needs of individual students who desire to enroll but are past their freshman year. Military science courses are open to all students regardless of whether or not they intend to seek an Army commission.

Faculty

Department Head and Professor: Michael B. Ahern, Lt. Col.
Assistant Professor: Stephen R. Meyer, Maj.; Robert D. Fath, Maj., James R. Von Holle, Capt.
Instructor: Larry L. Kelsey, Sgt. Maj.

Basic Course — All UAF students are eligible to enroll. There is no military obligation incurred by enrolling in any of the basic courses.

Advanced Course — Those students who successfully complete the basic course and desire to pursue the program for a commission, may apply for enrollment in the advanced course. Students with prior military service may also apply for immediate enrollment as an advanced course student. Applicants must be physically qualified and be selected by the professor of military science. The criterion for selection is based on both academic proficiency and leadership potential. Those students selected who desire to compete for a commission are provided a $100-per-month subsistence allowance. They also incur a military obligation. Students who wish to enroll in advanced course classes, but do not desire to earn a commission, may do so with the approval of the department head. The obligation and subsistence allowance will be waived for those students.

Academic Credit — A maximum of 23 credits in military science courses may be used as elective credit toward fulfillment of baccalaureate degree requirements.

Minor in Military Science — Military science is an approved minor for the bachelor of arts degree. The requirements for the minor are the

satisfactory completion of 19 credits in military science as approved by the department.

Financial Aid — Advanced course students receive a monthly subsistence allowance during the school year which presently amounts to approximately $2,000 for the two-year period. This allowance is tax free.

Uniforms and Equipment — Students enrolled in military science are furnished uniforms and texts by the department.

Awards — Awards are made annually at the UAF awards ceremony. Awards, such as the governor's and chancellor's medals, are presented for outstanding achievement in the ROTC program, academic achievement, and leadership.

ROTC Rifle Team — Competition is scheduled with civilian and military teams in the state. Postal matches with other schools are fired throughout the year. All necessary equipment is furnished by the Department of Military Science at no cost to the student.

Two-Year Program — A special Basic Camp program is available for transfer students and others who were unable to take ROTC prior to their last two years in school. This program allows immediate acceleration into the advanced course. Students should consult the PMS prior to 1 June annually for information concerning the camp.

Scholarships — Army ROTC scholarships pay all tuition, lab fees, and provides a book allowance in addition to the $100 monthly stipend. Scholarships are awarded for two or three years on a competitive basis. Interested students should contact the military science department for further details.

Music √

Degrees: B.A., B.M., M.A., M.A.T.

Minimum Requirements for Degrees: B.A. — 130 credits; B.Mus. — 127 credits, M.A. — 30 additional credits; M.A.T. — 36 additional credits.

The curriculum is designed to satisfy cultural and professional objectives.

The bachelor of arts degree in music is a curriculum planned for those desiring a broad, liberal education with a concentration in music.

The bachelor of music degree in music education offers thorough preparation in teacher training with sufficient time to develop excellence in performance areas.

The bachelor of music in performance degree offers intensive specialization for those desiring professional training in music performance.

The master of arts degree offers advanced training in five areas of specialization: performance, music education, music theory/composition, music history and Alaskan ethnomusicology.

The master of arts in teaching is designed primarily as a functional program for the public school music teacher. Areas of specialization are instrumental, vocal, music supervision, and elementary specialist. The program is determined by the student and his/her committee.

The various music organizations maintained by the department offer participation for students in all academic divisions of the university. Music majors will be required to participate in at least one ensemble (band, choir, orchestra, chorus) each semester they are enrolled. In addition, participation in chamber music opportunities is offered. Piano majors may receive ensemble credit by performing as accompanists.

Attendance at recitals and concerts provides students with a variety of musical experiences which expand their regular curriculum, therefore, attendance is mandatory for all majors. All applied music students are expected to perform in student recitals during each semester of study.

At the end of the sophomore year, all music majors must demonstrate a satisfactory level of proficiency of performance in their applied major in order to advance to upper-division courses in music. A student may elect to continue study at the 200 level in attempting to pass requirements for admission to upper-division study.

A piano proficiency jury examination must be successfully completed by the end of the student's second year in the program. This examination will consist of (1) performance of a recital composition equivalent in difficulty to a Bach two-part invention, or Clementi or Kuhlau sonatina; (2) sight reading of Bach Chorales; (3) improvisation of a chordal accompaniment to a simple melody; and (4) transposition and harmonization of the same song to another key.

Students who desire to enroll in music theory courses will complete a placement examination and be allowed to enter at their appropriate level.

Current and prospective music majors may obtain a copy of the music department's *Student and Faculty Handbook* for further information about current degree requirements.

The music department of UAF is a full member of the National Association of Schools of Music, the national accrediting organization.

Faculty

Department Head and Associate Professor: David Stech
Professors: James Johnson, Thomas Johnston, Gordon B. Wright
Associate Professors: Kathleen Butler-Hopkins, Theodore DeCorso, Bruno DiCecco, Suzanne Summerville
Assistant Professors: John Duff, John Hopkins

Requirements

Music — B.A. Degree

1. Complete general university requirements and B.A. degree requirements, page 29.

2. Complete the following program (major) requirements:

	Credits
Mus. 131-132 — Basic Theory	4
Mus. 133-134 — Basic Ear Training	4
Mus. 221-222 — History of Music	6
Mus. 231-232 — Advanced Theory	6
Mus. 331 — Form and Analysis	3
**Mus. 190 — Recital Attendance	0
Six credits to be selected from:	*Credits*
Mus. 421 — Music before 1620	3
Mus. 422 — Music in the 17th and 18th Century	3
Mus. 423 — Music in the 19th Century	3
Mus. 424 — Music in the 20th Century	3
Mus. 161-462 — Applied Music (major area)	8
Ensembles (may include up to 2 credits of Music 307 — Chamber Music)	6
Mus. 253 — Piano Proficiency	0
Minor Area	approx. 15
Free Electives	14

3. Minimum credits required 130

Music Education — B.A. Degree

1. Complete general university requirements and B.A. degree requirements, page 29.

2. Complete the following program (major) requirements:

	Credits
Mus. 131-132 — Basic Theory	4
Mus. 133-134 — Basic Ear Training	4
Mus. 221-222 — History of Music	6
Mus. 231-232 — Advanced Theory	6
Mus. 315 — Music Methods and Techniques	6*
Applied Music (to include 6 credits of private lessons and 10 credits of ensemble participation including 2 semesters of vocal ensembles)	16

Complete a minor in Education, including either:

Music 309 or Music 405 (Contact Education Dept. before starting Minor) ..... 27-35 or more
**Mus. 190 — Recital Attendance 0
Mus. 253 — Piano Proficiency 0

3. Minimum credits required 130

* 2 credit course completed 3 times.

Music — B.M. Degree (Performance)
1. Complete the general university requirements as listed on page 29.
2. Complete the following degree and program (major) requirements:

	Credits
Engl. 111 or equivalent and 211 or 213	6
Speech Communications	3
Humanities (non-music)	15
Mathematics (including Computer Science) Natural Science, Social Science	15

Required Music Courses:	Credits
Mus. 161-462 — Applied Music (major)	24
Mus. 131-132 — Basic Theory	4
Mus. 133-134 — Basic Ear Training	4
Mus. 221-222 — History of Music	6
Mus. 231-232 — Advanced Theory	6
Ensembles (1 per semester)	8

Secondary Area:

Thirty credits to be selected from the following:	Credits
Mus. 124 — Music in World Cultures	3
[1]Mus. 153 — Functional Piano	1
[2]Mus. 161-162, 261-262, 361-362, 461-462 — Applied Music (Secondary Performance Area)	2 or 4
Mus. 223 — Alaskan Native Musics	3
[1]Mus. 307 — Chamber Music	1
[1]Mus. 313 — Opera Workshop	1-3
[1]Mus. 317 — Arctic Chamber Orchestra	1
[5]Mus. 331 — Form and Analysis	3
Mus. 351 — Conducting	3
[4]Mus. 421-424 — Period History	6
[5]Mus. 431 — Counterpoint	3
[5]Mus. 432 — Orchestration	3
[5]Mus. 433 — Composition	3
[3]Mus. 493 — Special Topics	Arr.

[1] Repeatable for credit — Mus. 153, 307, 313, 317
[2] Any level repeatable for credit — Mus. 161-162, 261-262, 361-362, 461-462. Maximum total of 6 credits.
[3] Repeatable for credit — Mus. 493. Maximum total of 6 credits.
[4] Minimum of 6 credits to be selected from Mus. 421, 422, 423, 424.
[5] Minimum of 6 credits to be selected from Mus. 331, 431, 432, 433.

**Mus. 190 — Recital Attendance 0
Mus. 253 — Piano Proficiency 0

3. Minimum credits required for degree 127

A half recital will be required in the junior year and a full recital in the senior year. The student, in his graduation recital, must demonstrate ability to perform satisfactorily in public a program of artistic merit. See music department's *Student and Faculty Handbook* for details.

Music — B.M. Degree
(Music Education — Secondary)
1. Complete the general university requirements as listed on page 29.
2. Complete the following degree and program (major) requirements:

	Credits
Engl. 111 or equivalent and 211 or 213	6
Speech Communications	3
Humanities (non-music)	15
Mathematics (including Computer Science), Natural Science, Social Science; must include Psy. 101	15

Required Music Courses:	Credits
Mus. 161-462 — Applied Music (major)	14
Mus. 131-132 — Basic Theory	4
Mus. 133-134 — Basic Ear Training	4
Mus. 221-222 — History of Music	6
Mus. 231-232 — Advanced Theory	6
Mus. 315 — Music Methods and Techniques	10
Mus. 331 — Form and Analysis	3
Mus. 351 — Conducting	3
Mus. 432 — Orchestration	3
Ensembles (1 per semester)	8
**Mus. 190 — Recital Attendance	0
Mus. 253 — Piano Proficiency	0

Courses required for Secondary Certification (Contact Department of Education before beginning Education courses):

Psy. 240 — Developmental Psychology	3
Ed. 330 — Diagnosis and Evaluation of Learning	3
Ed. 402 — Methods of Teaching (or Subject Area Methods)	3
Ed. 407 — Reading Strategies for Secondary Students	3
Ed. 424 — Small School Programs	
or	
Ed. 425 — Community as Education Resource	3
Ed. 430 — Multicultural Teaching Techniques	3
~~Ed. 490~~ — Curriculum Development in Cultural Perspective	3
Ed. 453 — Secondary Student Teaching	12

ED 201-

One course from the following:

Ed. 345 — Sociology of Education	3
Ed. 346 — Structure of American/Alaskan Education	3
Ed. 350 — Communication in Cross-Cultural Classrooms	3
Ed. 380 — Cultural Influence in Education	3
Ed. 450 — Education and Cultural Transmission	3

3. Minimum credits required 130

Music — B.M. Degree
(Music Education — Elementary)
1. Complete the general university requirements as listed on page 29.
2. Complete the following degree and program (major) requirements:

	Credits
Engl. 111 or equivalent and Engl. 211 or 213	6
Speech Communications	3
Humanities (non-music)	15
Mathematics (including Computer Science), Natural Science, Social Science; must include Psy. 101 and 6 credits of Mathematics	15

Required Music Courses:	
Mus. 161-462 — Applied Music (major)	14
Mus. 131-132 — Basic Theory	4
Mus. 133-134 — Basic Ear Training	4
Mus. 221-222 — History of Music	6
Mus. 231-232 — Advanced Theory	6
Mus. 309 — Elementary School Music Methods (same as Ed. 309)	3
Mus. 315 — Music Methods and Techniques	10
Mus. 331 — Form and Analysis	3
Mus. 351 — Conducting	3
Mus. 432 — Orchestration	3
Ensembles (1 per semester)	8
**Mus. 190 — Recital Attendance	0
Mus. 253 — Piano Proficiency	0

Required Education courses (Contact education department before beginning Education courses):

Psy. 240 — Developmental Psychology	3
Ed. 304 — Literature for Children	3
Ed. 330 — Diagnosis and Evaluation of Learning	3
Ed. 419 — Integrated Methods	6
Ed. 423 — Reading Language and Literacy	6
~~Ed. 490~~ — Curriculum Development in Cultural Perspective	3
Ed. 452 — Elementary Student Teaching	12

ED 201

One course from the following:

Ed. 345 — Sociology of Education	3
Ed. 346 — Structure of American/Alaskan Education	3
Ed. 350 — Communication in Cross-Cultural Classrooms	3
Ed. 380 — Cultural Influences in Education	3
Ed. 450 — Education and Cultural Transmission	3

3. Minimum credits required 130

A minor in Music requires 18 credits in Music to be selected from the following:
Music Theory, [illegible] Appreciation (courses to be selected with approval of [illegible]d) 12
Music 1[illegible] 4
Musi[illegible] 2

**All undergraduate students majoring in Music must enroll in Music 190 — Recital Attendance during each semester of their residence.

Music — M.A. Degree

Students may select from the following areas of specialization: Performance, music education, music theory/composition, music history, and Alaskan ethnomusicology.

Each graduate student's program is individually tailored and designed to meet the student's professional interests and aspirations, consistent with the following principles and procedures:

1) General requirements for admission to graduate study are consistent with those published in the UAF catalog.

2) All applicants will take an evaluative preliminary examination to help determine areas of strength and deficiency. The examination will cover the following areas for all applicants:
a. Music theory.
b. Music history and literature.
c. Demonstration of keyboard proficiency.
d. Performance in major area.

In addition to the areas listed above, *music education* majors will be required to complete a section pertaining to organizations, literature, knowledge of instruments and voice, and rehearsal techniques appropriate for public school music instruction.

Composition majors must submit examples of previous work.

Performance majors must demonstrate acquaintance with solo literature of the various historical periods through audition or submission of performance tapes.

3) Applicants must also submit a proposal outlining their aspirations and interests that they wish to pursue for their degree program.

4) Upon completion of all of the above, the Music Department will assess its own potential to serve the needs of the student.

5) Applicants will be accepted from any accredited institution; however, before admission to a degree program, all students (including UAF graduates) must take the preliminary examination.

6) Following an applicant's admission to the program, the department head, after consultation with the applicant, will name an Advisory Committee of three faculty members, one of whom will act as chairman and academic advisor for the student. The committee will assess the results of the preliminary examination, and then guide the development and completion of the student's program.

The committee will monitor the student's progress in the program, and recommend modifications and improvements, should changes be necessary.

7) To establish a base of core curriculum requirements common to all graduate music programs, the following courses must be taken by all graduate students.

a. Music 601 — *Introduction to Graduate Study* (2 Credits).
b. *Applied Music:* A minimum of four credits of private lessons study at either the senior or graduate level. Committee may suggest further study if remedial work is deemed necessary.
c. Minimum of six graduate credits (excluding Individual Study) to be selected from the following categories: music theory, music history, ethnomusicology, music literature, and Mus. 671 — *Psychology of Music (3 credits).*

8) Each student, with the approval of the advisory committee, shall develop an appropriate final project or thesis. A thesis is required for students majoring in music theory, music history and ethnomusicology. Performance majors must present a graduate recital and prepare a supporting paper on selected aspects of the recital.

9) The minimum number of credits which must be earned for a master's degree is 30 semester hours, of which 21 will be in a primary area of specialization and the balance in a secondary area.

10) Near the completion of approximately one-half of the program, the student will meet with the committee in an advisory examination. This examination will be conducted orally and will be concerned primarily with the progress the student has demonstrated, particularly with regard to determining the major area of specialization. Such specialization is not to be conceived narrowly as a thesis topic, but rather as a broad area in which the student plans to spend an appreci[illegible] amount of his scholarly career. Advisory examinations may be re[illegible]til such time as the student has satisfactorily defined his area [illegible]ion.

11) Each candidate for a master's degree in music who completes the necessary course work must take a substantial oral examination in the area of his/her major project, thesis, or recital.

12) Students majoring in vocal performance, music history, or ethnomusicology will be required to demonstrate proficiency of a foreign language appropriate to the area of concentration. Proficiency will be determined by the student's graduate committee in conjunction with the Department of Linguistics and Foreign Languages.

13) Graduate students studying applied music and/or presenting recitals are governed by the same regulations concerning recital preparation, recital jury prehearings, and jury examinations as apply to undergraduate students. These regulations are described in the handbook.

14) 600-level courses are restricted to graduate students only; graduate students may also elect some of their courses from the 400-level. 400-level courses are open to both upper-division undergraduate students and graduate students as well. However, at least 24 credits of the program, including thesis or research, must be at the graduate level.

15) Further information about typical two-year programs may be obtained by contacting the Music Department.

Music — M.A.T. Degree

See the department for further details.

Northern Studies

Interdisciplinary Program

Degree: B.A.
Minimum Requirements for Degree: B.A. — 130 credits

The purpose of the northern studies program is to give interested students a broader study of the northern region — its environment, peoples, and problems. The major in northern studies is a composite and interdisciplinary one. Students must meet the prerequisite requirements set by each department for particular upper-division courses.

Requirements

Northern Studies — B.A. Degree

1. Complete general university requirements and B.A. degree requirements, page 29.
2. Complete the following program (major) requirements:

	Credits
Anth. 242 — Native Cultures of Alaska	3
Geog. 327 — Cold Lands	3
Hist. 380 — Polar Exploration and its Literature	3
A.L.R. 101 — Conservation of Natural Resources	3
Participate in the following seminar during the junior or senior year:	
Hist. 484 — Northern Studies Seminar	3

In addition, the student should take at least one course in five of the following six areas and sufficient other courses in one of the areas to equal a total of 18 credits:

Anthropology:	
Anth. 205 — Native Cultures of North America	3
Anth. 309 — Arctic Prehistory	3
Anth. 321 — Human Population Biology (Circumpolar Regions)	3
Linguistics:	
Any linguistics *or* Alaska Native language *or* Eskimo language course or courses	3 or more
Earth Sciences:	
Geog. 205 — Elements of Physical Geog.	3
Geog. 302 — Geography of Alaska	3
Geog. 306 — Geography of the Soviet Union	3

Geog. 401 — Weather and Climate 3
Geos. 462 — Glacial Geology 4

History:
Hist. 354 — Canadian History 3
Hist. 341 — History of Alaska 3
Hist. 344 — Modern Russia 3
Hist. 375 — History of the Northern Pacific 3
P.S. 263 — Alaska Native Politics 3

Ecology:
Biol. 104 — Natural History of Alaska 3
Biol. 271 — Principles of Ecology 3
W.F. 417 — Wildlife Mgmt.: Forest and Tundra 2

Sociology:
Soc. 201 — Social Problems 3
Soc. 408 — American Minority Groups 3

With the approval of the committee, students may make substitutions for some of the requirements in these areas by taking such relevant courses as: arctic engineering; economics of natural resources; arctic oceanography; and such other courses as are approved by the committee.

3. Minimum credits required 130

Philosophy

Degree: B.A.
Minimum Requirements for Degree: 130 credits

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

Faculty

Department Head and Assistant Professor: Barbara Alexander
Professors: Walter J. Benesch, Rudolph W. Krejci
Assistant Professor: John Kooistra

Requirements

Philosophy — B.A. Degree
1. Complete the general university requirements and B.A. degree requirements, page 29.
2. Complete the following program (major) requirements:
Complete 6 credits of mathematics at the 100 level or above.
Complete two years at the college level in a non-English language.
Complete 33 credits in philosophy, including:

	Credits
Phil. 201 — Introduction to Philosophy	3
Phil. 202 — Introduction to Eastern Philosophy	3
Phil. 204 — Introduction to Logic	3
Phil. 351-352 — History of Philosophy and Science	6
Phil. 471 — Contemp. Philosophical Problems	3
Phil. 493 — Special Topics	3

Choose two of the following:
Phil. 321 — Aesthetics 3
Phil. 322 — Ethics 3
Phil. 341 — Epistemology 3
Phil. 342 — Metaphysics 3

Choose two of the following:
Phil. 481 — Philosophy of Science 3
Phil. 482 — Comparative Religion 3
Phil. 483 — Philosophy of Social Science 3
Phil. 484 — Philosophy of History 3

3. Successfully complete a comprehensive oral examination conducted by the staff of the Department of Philosophy covering all course work in philosophy. The student is to arrange for the examination at the beginning of the last semester of his major study.

4. Minimum credits required 130

A minor in philosophy requires 18 credits of approved philosophy courses including:

	Credits
Phil. 201 — Introduction to Philosophy	3
Phil. 351-352 — History of Philosophy and Science	6
Phil. 471 — Contemp. Philosophical Problems	3

Choose six credits from the following:
Phil. 202 — Intro. to Eastern Philosophy 3
Phil. 204 — Introduction to Logic 3
Phil. 321 — Aesthetics 3
Phil. 322 — Ethics 3
Phil. 341 — Epistemology 3
Phil. 342 — Metaphysics 3
Phil. 481 — Philosophy of Science 3
Phil. 482 — Comparative Religion 3
Phil. 483 — Philosophy of Social Science 3
Phil. 484 — Philosophy of History 3
Phil. 493 — Special Topics ..... Arr.

Physical Education

Degrees: B.A., B.S.
Minimum Requirements for Degrees: B.A. — 130 credits; B.S. — 130 credits

The curriculum in physical education encompasses three programs of instruction: an academic discipline, a teacher certification specialty, and a program for individual development in physical activities.

1. The academic discipline of physical education, which can be a major or minor area of study for a bachelor's degree, is the study of human beings engaged in sport and physical activities which serve as expressions of their physical and competitive natures.
2. Courses which relate to teaching physical education or coaching athletic teams in school or recreation programs can be added to academic discipline courses to complete a teaching or coaching specialty for state certification.
3. Finally, a program of courses is provided for the general and professional student to acquire individual skills, attitudes, knowledge, and physical fitness for participation in selected sports and physical activities.

Faculty

Department Head and Associate Professor: Theresa H. Tomczak
Associate Professor: Allen R. Svenningson
Assistant Professors: Nancy E. Frith, Karen J. Morris, Barbara J. Motes, George T. Roderick, William L. Smith
Instructors: Frances S. Buckless, John Estle, Richard A. Schafer, Merle B. Young, Jr.

Requirements

Physical Education — B.A. or B.S. Degree
1. Complete the general university requirements and B.A. or B.S. degree requirements listed on pages 29 and 30.
2. Complete the following background requirements:

	Credits
Chem. 103 or 104 — Contemporary Chemistry	4

Biol. 111-112 — Human Anatomy and Physiology I and II 8
Math. 107 — Elementary Functions 3

3. Complete the following program (major) requirements:

Required Courses 25 Credits	*Credits*
P.E. 201 — Concepts in Fitness	2
P.E. 210 — Fundamentals of Softball, Aquatics and Ice Sports	2
P.E. 220 — Fundamentals of Wrestling, Basketball & Track & Field	2
P.E. 230 — Fundamentals of Soccer, Rhythms & Recreational Activities	2
P.E. 240 — Fundamentals of Gymnastics, Snow Sports and Volleyball	2
P.E. 246 — Advanced First Aid	3
P.E. 318 — Motor Development and Learning	3*
P.E. 421 — Physiology of Exercise	3
P.E. 432 — Biomechanics of Physical Performance	3
P.E. 437 — Adapted Programs of Physical Activity	3*

Elective Courses (select a minimum of four (4) credits)	*Credits*
P.E. 300 — Advanced Techniques of Gymnastics	1
P.E. 302 — Advanced Techniques of Basketball	1
P.E. 303 — Advanced Techniques in Ice Sports	1
P.E. 304 — Advanced Techniques in Snow Sports	1
P.E. 305 — Techniques in Volleyball	1
P.E. 306 — Techniques in Teaching Creative Dance	1
P.E. 307 — Techniques in Camping and Outdoor Recreation	1
P.E. 308 — Techniques in Track and Field	1
P.E. 309 — Aquatics Instructor	1
P.E. 310 — Techniques in Teaching Rhythms and Dance	1

Elective Courses (select a minimum of 7 credits)	*Credits*
P.E. 321 — Practicum in Physical Education	1*
P.E. 327 — Movement Activities for Children	2*
P.E. 401 — Theory of Basketball	2
P.E. 406 — Methods of Teaching P.E.	3*
P.E. 411 — Sports & Physical Activity in American Society	3
P.E. 412 — Principles and Problems in Athletic Coaching	3
P.E. 425 — Administration of P.E. and Athletics	3*
P.E. 440 — Prevention and Care of Athletic Injuries	3
P.E. 442 — Evaluation in Physical Education	3*

*Required by the Physical Education Department for those majors who wish to be considered for Teaching Certification.

4. Minimum credits required 130

Teaching Certification:

In addition to the 25 required and 4 elective credits from the 300-310 series, students working toward teacher certification with the B.S. or B.A. in Physical Education must complete:

	Credits
P.E. 321 — Practicum in Physical Education	1
P.E. 327 — Movement Activities for Children	2
P.E. 406 — Methods and Materials in Teaching Physical Education	3
P.E. 425 — Organization and Administration in Physical Education and Athletics	3
P.E. 437 — Adapted Programs of Physical Education	3
P.E. 442 — Measurement and Evaluation in Physical Education	3
Total	16

AND the required courses from the Education Department (see page 96.)

Physical Education — Minor:

For a minor in P.E. for a B.A. Degree, complete 18 approved credits in Physical Education at the 200-level or above.

Athletic Coaching — Minor:

A minor in athletic coaching (18 credits) is available for those students more interested in the coaching of athletic teams, in schools or communities, than in the more general discipline of physical education.

1. Complete the following required courses:	*Credits*
P.E. 411 — Sport and Physical Activity in American Society	3
P.E. 412 — Principles and Problems in Athletic Coaching	3
P.E. 421 — Physiology of Exercise	3
P.E. 432 — Biomechanics of Physical Performance	3
P.E. 440 — Prevention and Care of Athletic Injuries	3
2. Complete the remaining credits in approved courses which will develop competency in the area selected for coaching	3

(Note: This minor is not available to the physical education major.)

Political Science

Degree: B.A.
Minimum Requirements for Degree: 130 credits

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

Students of political science may prepare for teaching or for advanced study in law and the social sciences, or prepare themselves for careers in public service.

Faculty

Department Head and Professor: Gerald A. McBeath
Professor: R. London Smith
Associate Professors: David Case, Gary Copus, Andrea Helms
Assistant Professors: Marc Stier, Kendall Stockholm
Instructor: Carl Shepro

Requirements

Political Science — B.A. Degree

1. Complete general university requirements and B.A. degree requirements, pages 29 and 30.

2. Complete the following social science distribution requirements. (May be used to meet general B.A. requirements):

	Credits
Econ. 201-202 — Principles of Economics I and II (may substitute another economics course for Econ. 201 or 202 on the recommendation of advisor)	6
Hist. 131-132 — History of the U.S.	6
Just. 110 — Introduction to Justice or Psy. 101 — Introduction to Psychology or Soc. 101 — Introduction to Sociology	3

3. Complete 30 credits in political science, beyond P.S. 101 including:

Three Credits in Policy & Administration from:	
P.S. 102 — Introduction to American Government and Politics	3
P.S. 210 — Alaska Government and Politics	3
P.S. 211 — State and Local Government	3
P.S. 212 — Introduction to Public Administration	3
P.S. 263 — Alaska Native Politics	3
Six Credits in Comparative Politics as follows:	
P.S. 201 — Comparative Politics: Methods of Political Analysis	3
Choose one of the following:	
P.S. 202 — Comparative Politics: Contemporary Doctrines and Structures	3
P.S. 310 — The Politics of Post-Industrial States	3
P.S. 311 — Government and Politics of the Soviet Union	3
P.S. 312 — Government and Politics of China	3
Six Credits in International Politics from:	
P.S. 321 — International Politics	3
P.S. 322 — International Relations	3
P.S. 437 — American Foreign Policy and National Security	3
P.S. 480 — The United Nations, Model United Nations and International Administration	1-3
P.S. 481 — Geopolitics and the International Environment	3
Three credits in Law and National Government Institutions from:	
P.S. 301 — American Presidency	3
P.S. 302 — Congress and Public Policy	3
P.S. 435 — The Supreme Court and the American Legal System	3
P.S. 436 — The Courts and Civil Liberties	3

Six credits in Political Theory from:
P.S. 315 — American Political Thought 3
P.S. 411 — Classical Political Theory 3
P.S. 412 — Modern Political Theory 3
P.S. 415 — Contemporary Political Theory 3

Six credits in Political Behavior as follows:
P.S. 400 — Political Science Research Methods 3
Choose one of the following:
P.S. 401 — Political Behavior: Organizations 3
P.S. 402 — Political Behavior: Individuals 3
P.S. 403 — Public Policy 3

4. Minimum credits required 130

A minor in Political Science requires 15 credits distributed as follows:

	Credits
P.S. 101 — Introduction to American Government and Politics (I)	3
Three credits in policy and administration from the following: P.S. 102, 210, 211, 212, or 263	3
Three credits in comparative politics from the following: P.S. 201, 202, 310, 311, or 312	3
Three credits in international politics from the following: P.S. 321, 322, 437, 480 or 481	3
Three credits in political theory from the following: P.S. 315, 411, 412, or 415	3

Russian Studies

Interdisciplinary Major Program

Degree: B.A.
Minimum Requirements for Degree: 130 credits

Requirements

Russian Studies — B.A. Degree
1. Complete general university requirements and B.A. degree requirements, page 29.
2. Complete the following program (major) requirements:

Core courses (24-25 credits):	Credits
Approved Anthropology Elective	3
Geog. 306 — Geography of the Soviet Union	3
Hist. 261 — Russian History	3
Hist. 344 — Twentieth Century Russia	3
Russ. 301 — Advanced Russian*	3
Russ. 303 — Advanced Russian*	3
Russ. 432 — Studies in Russian Lit. and Culture (twice - 6 cr.) or Russ. 432 — Studies in Russian Lit. and Culture (once - 3 cr.) and Russ. 387 — Semantics (2 cr.) and Russ. 487 — Translation (2 cr.)	6-7

Complete at least 12 credits from the following courses or alternatives as approved by the program advisor:

Geog. 405 — Political Geography	3
Hist. 315 — Europe 1914-1945	3
Phil. 471 — Contemporary Philosophical Prob.	3
P.S. 202 — Comparative Politics: Contemporary Doctrines and Structures	3
P.S. 321 — International Politics	3
P.S. 322 — International Relations	3

3. Minimum credits required 130

*Students must complete two years of Russian language study (Russ. 101-102-201-202) or equivalent as a prerequisite for Russ. 301-303.

Minor in Russian:

A minor in Russian studies requires 15 credits taken from the core courses and approved by the program adviser.

Speech Communication

Degree: B.A.
Minimum Requirements for Degree: 130 credits

The Department of Speech and Drama offers the student many opportunities to participate in formal communication processes through theater productions, debates, oral interpretation presentations, etc., and to study the processes through formal course offerings in speech communication and theater. Blending practical application with the study of fact and theory, each program is designed to provide majors with the preparation for employment or further education and to provide all students with elective opportunities in fields of study central to all human communication.

The department offers the following programs:

- A major or minor in speech communication with options in rhetoric and public address, communication studies, and communication education
- A major or minor in theater

Faculty

Department Head and Associate Professor: Walter G. Ensign, Jr.
Professor: Lee H. Salisbury
Associate Professor: Jayna Orchard
Assistant Professors: Robert Arundale, John Leipzig, David D. Smith
Instructor: Marcia Stratton

Requirements

1. Complete the general university degree requirements and B.A. degree requirements as listed on page 29, including one of the following three courses for the Oral Communication requirement: Sp.C. 121, Sp.C. 131, or Sp.C. 141. *The course completed to meet the University Oral Communication requirement may not be used to meet the requirements of the Speech Communication Major listed in section 2.*
2. Complete a minimum of 30 credits in *approved Speech* Communication courses.
The courses must be distributed as follows:

100 level courses	3 credits
200 level courses	6 credits
300 level courses	12 credits
400 level courses	9 credits

COURSES	Credits
100 Level	
Sp.C. 121 — Fundamentals of Oral Communication-Interpersonal Emphasis	3
Sp.C. 131 — Fundamentals of Oral Communication-Small Group Emphasis	3
Sp.C. 141 — Fundamentals of Oral Communication-Public Speaking Emphasis	3
200 Level	
Sp.C. 211 — Voice and Diction	3
Sp.C. 221 — Interpersonal Communication	3
Sp.C. 231 — Business and Professional Speaking	3
Sp.C. 251 — Argumentation and Debate	3
Sp.C. 261 — Oral Interpretation	3
300 Level	
Sp.C. 320 — Communication and Language	3
Sp.C. 321 — Nonverbal Communication	3

Sp.C. 330 — Intercultural Communication 3
Sp.C. 335 — Organizational Communication 3
Sp.C. 341 — Persuasion 3
Sp.C. 342 — Advanced Public Speaking 3

400 Level
Sp.C. 425 — Communication Theory 3
Sp.C. 443 — Rhetorical Theory 3
Sp.C. 475 — Speech Communication Methods for the Classroom 3
Sp.C. 482 — Seminar in Speech Communication 3

3. Minimum credits required 130

Minor in Speech Communication:
A minor in Speech Communication requires the completion of 18 credits in Speech Communication courses beyond the courses taken to satisfy the university oral communication requirement. A minor program requires the approval of the Speech Communication faculty in advance of declaring the minor, preferably no later than the first semester of the student's junior year.

Theater

Degree: B.A.
Minimum Requirements for Degree: 130 credits

Faculty

Speech communication and theater comprise the Department of Speech and Drama and have the same faculty. See speech communication.

Requirements

Theater — B.A. Degree
1. Complete the general university requirements and B.A. degree requirements, page 29.
2. Complete the following program (major) requirements:
A. Complete a minimum of 45 credits in theater and stipulated related courses as specified below, including the following foundation courses:

Credits

Thr. 211 — Introduction to the Theater 3
Thr. 221 — Acting I 3
Thr. 241 — Basic Stagecraft 3
Thr. 331 — Directing 3
Thr. 354 — Costume Construction and Design 3
Thr. 411 — Theater History I *or*
Thr. 412 — Theater History II 3
B. Complete the following:
1. A minimum of two courses from: 6
Thr. 225 — Movement for the Actor
Thr. 321 — Acting II
Thr. 325 — Theatre Speech
Thr. 351 — Makeup for Theater
Thr. 421 — Period Styles of Acting
2. A minimum of two courses from: 6
Thr. 341 — Intermediate Stagecraft
Thr. 343 — Scene Design
Thr. 347 — Lighting Design
Thr. 355 — History of Stage Costume
***3.** A minimum of two courses from: 6
Engl. 422 — Shakespeare: History Plays and Tragedies
Engl. 425 — Shakespeare: Comedies and Non-Dramatic Poetry
Engl. 445 — 20th Century Drama: Chekhov to Ionesco
Engl. 483 — Craft of Drama
***4.** A minimum of one course from: 3
Art 261 — History of World Art
Art 262 — History of World Art
Mus. 123 — Experiencing Music
Mus. 124 — Music in World Cultures
***5.** A minimum of one course from: 2-3
Art 105 or 106 — Beginning Drawing
J-B 215 — Audio Production
J-B 216 — Television Production
E.S. 101 — Graphics (2 cr.)
P.E. 100 — Modern Dance, Fencing, Gymnastics (1 cr. each)
Sp.C. 361 — Oral Interpretation
Sp.C. 211 — Voice and Diction
F.L. 110 — Pronunciation of French, German, Italian and Spanish
6. A minimum of one course from: 3
An additional course from 1,2,3, or 4 above
A second semester of Theater History (411 or 412, which ever was not taken to meet the requirement in A, above)
Thr. 435 — Directing
An individual study in theater
7. Minimum credits required 130

*May be used to meet general degree requirements where applicable.

Minor in Theater:
A minor in Theater requires 18 credits in theater courses including the following:

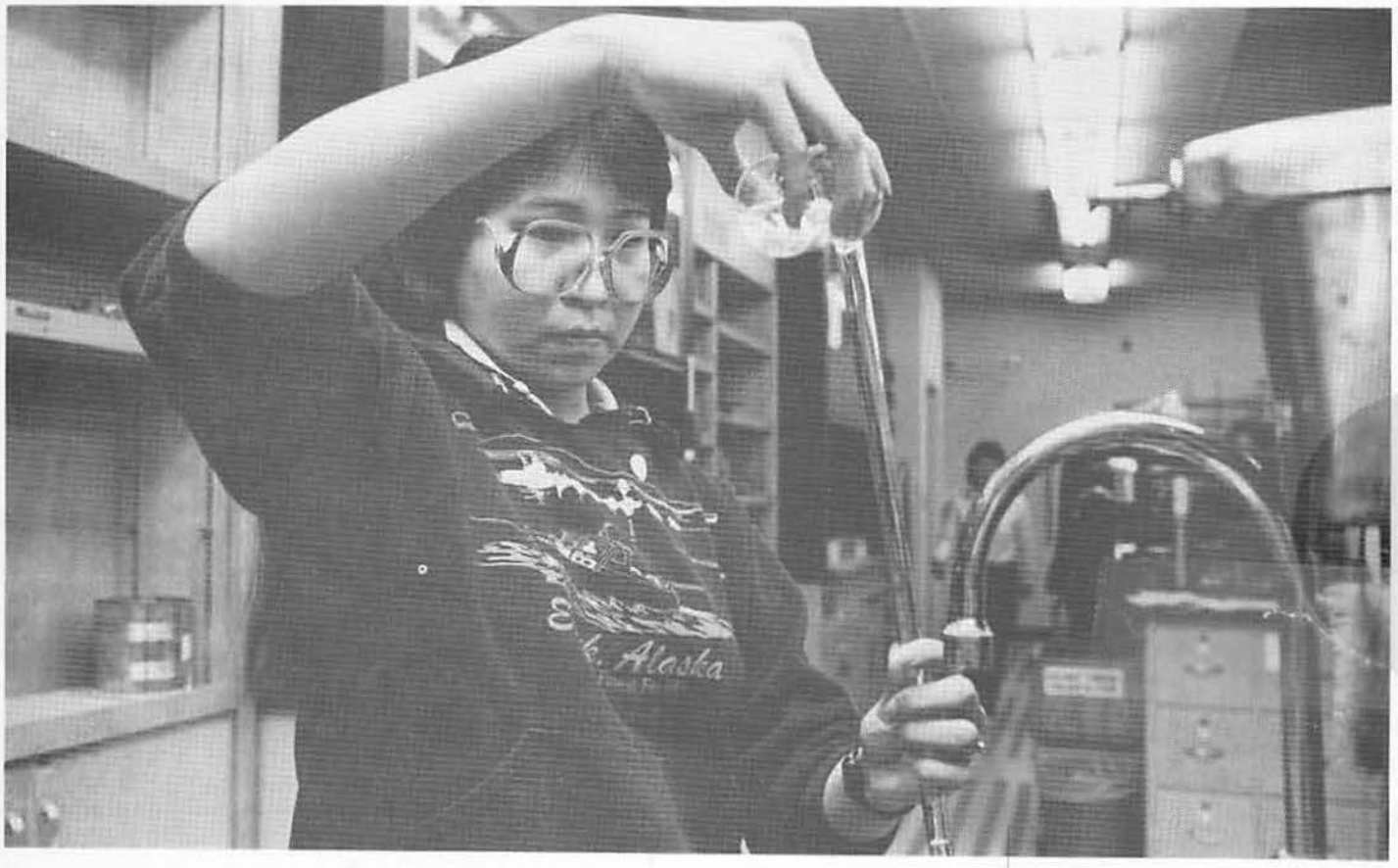
Thr. 211 — Introduction to the Theater
Thr. 221 — Acting I
Thr. 241 — Basic Stagecraft

No more than 3 credits in theater practicum may be applied to the minor. The minor program requires the approval of a member of the theater faculty in advance of formally declaring the minor, preferably no later than the first semester of the junior year.

Production Participation Requirement

Majors and minors in theater are expected to participate actively, extensively and continuously in the production activities of the program throughout their enrollment as majors or minors at the university. Typically, this means that a major is expected to work on some aspect of every major production and a minor on approximately half the major productions. Failure to meet the department's expectations with respect to such participation will be considered in approving students for graduation. A student whose failure to fulfill this expectation is, in the view of the theater faculty, jeopardizing his/her future graduation approval and will be notified of this situation, and for this purpose each student's progress in the program will be reviewed annually toward the end of each academic year. Theater majors may take theater practicum for elective credit, but it will not be counted in the credit total for the major.

College of Natural Sciences



The College of Natural Sciences embraces seven areas of study: biology, wildlife and fisheries; geology and geophysics; chemistry, physics, space physics and atmospheric sciences; marine sciences and limnology; and medical science. The major undergraduate programs are in biology, geology, chemistry and physics. Work at the master's level is offered in all of the areas of study. Graduate programs only are offered in space physics, atmospheric sciences, and marine sciences. The college also includes a health science program; the WAMI Program cooperates with three other states to provide medical training for Alaskan students. Graduate programs take advantage of the outstanding research facilities relating to northern problems: the Geophysical Institute, the Institute of Marine Science, the Institute of Arctic Biology, the Alaska Cooperative Wildlife Research Unit and the Alaska Cooperative Fishery Research Unit.

Undergraduate Degrees — Bachelor of science in geology (options in general geology, economic geology, geophysics and petroleum geology), biological sciences, fisheries science (research and management options), wildlife management, chemistry and physics. Bachelor of arts in biological sciences and earth science.

Graduate Degrees — Master of science in physics, chemistry, geology, geophysics, oceanography, (biological, physical, geological, fisheries and chemical), marine biology, botany, biology, zoology, wildlife management, fisheries biology, space physics and atmospheric sciences. Master of arts in teaching in biological sciences, physics, chemistry and geology. Ph.D. in physics, space physics, atmospheric sciences, geophysics, geology, oceanography (biological, geological, chemical and fisheries physical) and a variety of interdisciplinary degrees in biological sciences, wildlife management and fisheries.

College of Natural Sciences Organization

Dean, College of Natural Sciences: **Kolf Jayaweera**

Biology, Wildlife and Fisheries: Stephen MacLean, Dept. Head
Geology, Geophysics: Don Triplehorn, Dept. Head
Physics, Abas Sivjee, Dept. Head
Chemistry, Claron Hoskins, Dept. Head
Marine Sciences & Limnology, R. Theodore Cooney, Dept. Head
Space Physics & Atmospheric Sciences, Joe Kan, Dept. Head

Medical Science (WAMI), Ray Bailey, Acting Head

Affiliation with Northern Institutes
Geophysical Institute: Juan Roederer, Director
Institute of Marine Science: Vera Alexander, Director
Institute of Arctic Biology: John Bligh, Director
Alaska Cooperative Wildlife Research Unit: David R. Klein, Unit Director
Alaska Cooperative Fishery Research Unit: Jim Reynolds, Unit Director
WAMI — Ray Bailey, Acting Director

Biological Sciences

Degrees: B.A., B.S., M.S., M.A.T., Ph.D. (Interdisciplinary)
Minimum Requirements for Degrees: B.A. — 130 credits; B.S. — 130 credits; M.S. — 30 additional credits; M.A.T. — 36 additional credits

The curricula in the biological sciences program 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 B.S. degree may have majors in biological sciences. The B.A. degree includes fewer credits in the major field, but gives greater emphasis in the fields of social sciences and humanities and allows a greather breadth of subject matter in the curricula. The B.S. degree includes a foundation in the basic sciences as well as a stronger major within the biological sciences program. Candidates who expect to teach in public secondary schools must be sure that education requirements are met.

Faculty

Head, Department of Biology, Fisheries and Wildlife and Professor: Stephen F. MacLean, Jr.
Program Head and Professor of Zoology: R. Dale Guthrie
Professors: F. Stuart Chapin, Dale D. Feist, David F. Murray, Ronald L. Smith, L. Gerard Swartz, Robert G. White
Associate Professors: Carol F. Feist, Keith Miller, Mark W. Oswood, Gerald F. Shields
Assistant Professors: W. Scott Armbruster, John F. Fox, Edward C. Murphy
Instructor: Douglas Schamel
Adjunct Faculty: Robert Elsner, Francis H. Fay, Howard Feder, Brina Kessel

Requirements

Biological Sciences — B.A. Degree
1. Complete the general university requirements and B.A. degree requirements, page 29.
2. Complete the following program (major) requirements:

Biology 105-106, 210, 252, 271, and at least 16 additional credits in biology, including at least one course in botany, one in microbiology, and one in zoology.* A majority of these additional credits in biology must be upper division (300-400) courses. A maximum of 5 credits of independent study (97) may be applied to this requirement.
Chemistry — one year
Mathematics — one year
A minor in biological sciences requires 20 credits in biology, including Biol. 105-106, 252, and 271 and two of the following courses:
Biol. 210, 239, 242, 305.

3. Minimum credits required 130

Biological Sciences — B.S. Degree
1. Complete the general university requirements, page 23, and the B.S. degree requirements in communications and social sciences/humanities, page 30.
2. Complete the following program (major) requirements: Biol. 105-106, 210 or 416, 239, 242, 252, 271 and at least 17 additional credits, including at least one course in zoology (Biol. 222, 305, 317, or 406). At least 13 credits in biology must be upper division (300-400) level courses. A maximum of 6 credits of independent study (-97) may be applied to this requirement.*
Math 200 or 272, AS 301
Chem. 105-106, 321-322.
At least two courses in addition to those listed above, chosen from Applied Statistics, Chemistry (200 level or above), Geosciences, Mathematics (200 level or above), Physics, Oceanography and/or Space Physics and Atmospheric Science.
Foreign Language — one collegiate year; or 6 credits of social sciences and/or humanities beyond the general requirements for the B.S. degree.

*Students may petition to substitute up to 7 credits in the B.A. program or 10 credits in the B.S. program of chemistry courses, approved in advance, for the additional biology credits required for the degree.

3. Minimum credits required 130

Students from Other Departments
Candidates for the bachelor of science degree in general science wishing a major in biological sciences must satisfy both the requirements of their major curriculum and those listed above for a B.A. degree with a major in biological sciences.

Botany, Biology, or Zoology — M.S. Degree
1. Complete the general university requirements and master's degree requirements, pages 29 and 31.
2. Complete a minimum of 30 credits of approved courses. At least 24 credits, including thesis and research, must be at the 600 level.
3. Students working in subject areas involving significant non-English literature may be expected to read the appropriate foreign language.

M.A.T. Degree
Persons interested in this degree program should see the head of the department.

Ph.D. Degree
See page 34 for degree requirements.

Chemistry

Degrees: B.A., B.S., M.A., M.A.T., M.S.
Minimum Requirements for Degrees: B.A., B.S. — 130 credits; M.A., M.S. — 30 additional credits; M.A.T. — 36 additional credits

Graduates in chemistry qualify in many fields as teachers of chemistry; supervisors in industry; technical sales personnel; research chemists in federal, state, municipal, academic, or industrial laboratories; in pre-medicine; or as laboratory technicians. The rapid introduction of chemical techniques in all branches of commerce and the creation of the many synthetic products has caused substantial growth in the profession. In addition to the traditional employment opportunities in chemistry, well-qualified graduates find positions in the fields of environmental science, oceanography, and related interdisciplinary fields.

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, and advanced courses in biology, chemistry, mathematics, and physics according to the interest of the individual student.

The primary purpose of the program is to provide the educational basis for creative scientists who are so vital to the future development of the nation and the State of Alaska. In particular, the chemistry department encourages study of chemical problems associated with the Arctic in order to provide qualified staff for all schools and laboratories in Alaska. After the introductory courses, the curriculum is planned first, for the student majoring in the broad field of chemistry and second, for the nonmajor who is primarily interested in other aspects of the physical or biological sciences, but who requires competency in the theories and techniques of contemporary chemistry to succeed in his chosen field. Such service courses and programs are an outstanding feature of the department.

The department offers the student well-equipped laboratories housing instrumentation for nuclear magnetic resonance spectrometry, infrared, ultraviolet/visible, laser Raman, and atomic absorption spectrophotometry, mass spectrometry, gas chromatography, and carbon-hydrogen-nitrogen analysis. Additional equipment such as gas chromatograph/mass spectrometer, x-ray diffractometer, electron microscope, and liquid scintillating counters are available in cooperation with other departments and institutes at UAF.

Faculty

Department Head and Professor: L. Claron Hoskins
Professors: Paul R. Reichardt, David Shaw
Associate Professors: Charles Genaux, Donald Lokken, Richard Stolzberg, Betty Anne Philip
Assistant Professor: John Keller
Instructor: Donald Gibler

The chemistry department's four-year B.S. curriculum is accredited by the American Chemical Society.

Requirements

Chemistry — B.A. Degree

1. Complete the general university requirements and B.A. degree requirements, page 29.

2. Complete the following program (major) requirements:

	Credits
Chem. 105-106 — General Chemistry	8
Chem. 212* — Intro. Quantitative Analysis	4
Chem. 321-322 — Organic Chemistry	6
Chem. 324 — Organic Laboratory	3
Chem. 331-332 — Physical Chemistry	6
Chem. 433-434 — Instrumental Methods in Chem	6
Chem. 492 — Seminar (seniors)	2
C.S. 201 — Computer Programming *or* E.S. 201 — Computer Techniques	3
Math. 200-201-202 — Calculus	12
Phys. 103-104 or 211-212 — General Physics	8
3. Total Credits Required	130

Chemistry — B.S. Degree

1. Complete the general university requirements and B.S. degree requirements, pages 29 and 30.

2. Complete the following program (major) requirements:

Complete the courses required for a B.A. degree with a major in Chemistry as listed above. Complete the following additional Chemistry courses:

	Credits
Chem. 402 — Inorganic Chemistry	3
**Chem. 421 — Adv. Organic Chemistry *or* **Chem. 431 — Adv. Physical Chemistry *or* **Chem. 451 — General Biochemistry	3-4
Chem. 492 — Seminar (Juniors)	0
**Chem. 498 — Research	4
3. Total Credits Required	130

Suggested Curriculum for a B.S. Degree

First Year

Fall Semester	*15 to 18 credits*
Chem. 105 — General Chemistry	4
Phys. 103 or 211 — General Physics	4
Math. 200 — Calculus	4
Engl. 111 — Methods of Written Comm.	3
***Social Sci./Humanities elective	0-3
Spring Semester	*15 to 18 credits*
Chem. 106 — General Chemistry	4
Phys. 104 or 212 — General Physics	4
Math. 201 — Calculus	4
Speech Communications Elective	3
***Social Sci./Humanities elective	0-3

Second Year

Fall Semester	*17 or 18 credits*
Chem. 212 — Intro. Quantitative Analysis	4
Chem. 321 — Organic Chemistry	3
Math. 202 — Calculus	4
Engl. 211 — Intermediate Expos. and Modes of Lit. *or* Engl. 213 — Intermediate Exposition	3
***Social Sci./Humanities elective	3-4
Spring Semester	*15 or 16 credits*
Chem. 322 — Organic Chemistry	3
Chem. 324 — Organic Laboratory	3
E.S. 201 — Computer Techniques	3
***Social Sci./Humanities electives	6-7

Third Year

Fall Semester	*16 or 17 credits*
Chem. 331 — Physical Chemistry	3
Chem. 433 — Instrumental Methods in Chemistry	3
Chem. 492 — Seminar	0
***Electives	10-11
Spring Semester	*15 or 16 credits*
Chem. 332 — Physical Chemistry	3
Chem. 434 — Instrumental Methods in Chemistry	3
Chem. 492 — Seminar	0
***Electives	10-11

Fourth Year

Fall Semester	*16 or 18 credits*
**Chem. 421 — Adv. Organic Chemistry *or* **Chem. 431 — Adv. Physical Chemistry *or* **Chem. 451 — General Biochemistry	3-4
Chem. 492 — Seminar	1
**Chem. 498 — Research	2
***Electives	7-10
Spring Semester	*16 or 18 credits*
Chem. 402 — Inorganic Chemistry	3
Chem. 492 — Seminar	1
**Chem. 498 — Research	2
***Electives	10-12

**Advanced courses in chemistry, mathematics, geology, physics, or biological sciences may be substituted with the approval of the Department of Chemistry.

***A minimum of 130 credits must be earned. This curriculum meets the suggested minimum standards of the American Chemical Society, but additional advanced courses in chemistry may be elected with the approval of the Department of Chemistry. Graduates are certified by the American Chemical Society on completion of appropriate courses. A reading knowledge of a foreign language, although not required for professional undergraduate education in chemistry, is strongly recommended, particularly for students planning advanced study in science. German is especially useful.

Chemistry foundation courses may be used toward partial fulfillment of the natural science requirement for the B.S. degree with a major in Chemistry.

Requirements for a Minor in Chemistry

A minor in chemistry requires 12 credits above the foundation courses (Chem. 105-106 or Chem. 211) approved by the head of the Chemistry Department.

Chemistry — M.A. or M.S. Degree

1. Complete the general university requirements and master's degree requirements, pages 29 and 31.

2. Complete a minimum of 30 credits of approved courses. At least 24 credits, including thesis and/or research, must be at the 600 level.

A graduate student seeking a master's degree with a major in chemistry must develop a program in one of the general divisions of chemistry: analytical, biochemistry, inorganic, organic or physical. A student entering without preparation to take these courses may require additional time to earn his degree.

M.A.T. Degree

Persons interested in this degree program should see the head of the department.

Earth Science

Degree: B.A.
Minimum Requirements for Degree: 130 credits

This program provides broad training in various aspects of earth science. It is especially applicable to those wishing to teach earth science or who are entering a field such as resource management where broad training in earth science is important. Basic course work is required in three program areas: geography, geology and mineral engineering. Additional required course work is arranged in consultation with the individual program heads. Students wishing to enroll in this degree program should contact the head of the Department of Geology and Geophysics.

Requirements

Earth Science — B.A. Degree

1. Complete the general university requirements and B.A. degree requirements, page 29.
2. Complete the following fundamental courses:
   - A. Complete one year of college-level mathematics
   - B. Complete one semester of college chemistry (Chem. 103 recommended) or one semester of college physics (Phys. 103 recommended)
   - C. Complete one semester of computer science approved by major subject emphasis program head.

   (NOTE: A. and B. may be used to meet general degree requirements, but C. is in addition to the 6 credit mathematics/logic degree requirements.)
3. For the major complex, complete 19 credits in the following courses (labs are optional but it is strongly recommended they be taken if offered): Geog. 205, 309 or 339, and 402; Geos. 101 or 261, and 112; Min. 101 and 103. In addition, complete an additional approved 10 credits at the 300 level or above with emphasis in either geography, geology and geophysics, or mineral engineering. Approval will be by the appropriate program head in the field of emphasis.
4. Complete an additional 12 credits of the following or approved alternative courses (can also be used to meet basic degree requirements and to apply toward minor requirements): ALR 101, 310, 350, 380, 400, 401, 430; Biol. 103 or 105-106, 271; Geog. 301, 492; Geos. 213, 214, 304, 401, 408, 422; Min. 202, 320; Pet.E. 103; G.E. 471. If these 12 credits are listed for the minor, they must be in a different field than the major.
5. Complete approved electives including minor requirements to bring total credits to 130.

Fisheries Science

Degrees: B.S., M.S.
Minimum Requirements for Degrees: B.S. — 130 credits; M.S. — 30 additional credits

The fisheries undergraduate curriculum in the wildlife and fisheries program is intended to provide 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 fisheries work. Students contemplating careers in research, administration, advanced management, or teaching will find the bachelor's curriculum a solid foundation for graduate study.

The geographic location of UAF is advantageous for the study of interior Alaska aquatic habitats. A number of subarctic streams and lakes are within easy reach. Access to the marine environment is being obtained through the National Sea Grant Program in Prince William Sound.

Adequate study collections of fishes are available, and the invertebrate collection is being rapidly expanded. Undergraduates have an opportunity for association with personnel of federal and state conservation agencies and these agencies hire a number of students for summer field work. Course descriptions are listed in wildlife management program.

Faculty

Fisheries Program

Head, Department of Biology, Fisheries and Wildlife and Professor: Stephen F. MacLean, Jr.
Program Head and Associate Professor: Mark W. Oswood
Professor: Ronald L. Smith
Associate Professor: James B. Reynolds
Assistant Professors: Willard E. Barber, Jacqueline D. LaPerriere

Alaska Cooperative Fishery Research Unit

Unit Leader: James B. Reynolds
Unit Assistant: Jacqueline D. LaPerriere

Requirements

Fisheries Science — B.S. Degree

1. Complete the general university requirements listed on pages 29 and 30 including:

	Credits
English 111 and 213	6
Speech Communication (Sp. C. 131 or 141)	3
Social Science & Humanities (excluding social science and humanities courses in program requirements)	15

2. Complete the following degree and program (major) requirements:

A. Core Courses:

General (32 credits)	
A.L.R. 101 — Conservation of Natural Resources	3
Engl. 414 — Research Writing	3
A.S. 301 — Elementary Prob. and Stat.	3
Chem. 105, 106 — General Chemistry	8
*Math. 272, 273 — Intro. to Calculus for Life. Sci.	6
Econ. 235 — Natural Resource Econ	3
C.S. 201 — Computer Programming I	3
Geog. 205 — Elements of Physical Geography	3
Biology (24 credits)	
Biol. 105, 106 — Fundamentals in Biol. I and II	8
Biol. 271 — Principles of Ecology	4
Biol. 210 — Animal Physiology	4
Biol. 252 — Principles of Genetics	4
Biol. 423 — Ichthyology	4
Fisheries (11 credits)	
W.F. 423 — Limnology	3
or	
Biol. 328 — Biology of Marine Organisms	3
W.F. 429 — Intro. to Fisheries Science	3
W.F. 430 — Fisheries Management	3
W.F. 382 — Biol. of Freshwater Fish of Alaska	2

*or Math 200, 201, & 202 — Calculus

B. Electives:

Take one course from each of the following groups of courses:

Group 1 (3-5 credits)	*Credits*
Biol. 242 — Intro. to Microbiology	4
Biol. 307 — Parasitology	3
Biol. 343 — General Bacteriology	5
Group 2 (3-5 credits)	
Biol. 222 — Biology of the Vertebrates	4
Biol. 205 — Vertebrate Anatomy	3
Biol. 317 — Comparative Anatomy of Vertebrates	5
Group 3 (3 credits)	
Biol. 472 — Communities and Ecosystems	3
Biol. 471 — Population Ecology	3
Biol. 328 — Biology of Marine Organisms *(if used here, cannot satisfy fisheries core course requirements)*	3
W.F. 425 — Ecology of Streams and Rivers	3
Group 4 (3-4 credits)	
Biol. 305 — Invertebrate Zoology	4
Biol. 406 — Entomology	4
W.F. 424 — Aquatic Entomology	2
Group 5 (3 credits)	
W.F. 435 — Water Pollution Biology	3
W.F. 436 — Introduction to Aquaculture	3
A.L.R. 370 — Introduction Watershed Management	3

C. Option — Complete the requirements for one of the following options:

Research Option: *Credits*

Choose 6-8 credits from the courses listed below:

A.S. 302 — Intro. to Exp. Design (3 credits)
A.S. 402 — Scientific Sampling (3 credits)
Chem. 212 — Intro. Quant. Analysis (4 credits)
Chem. 321-322 — Organic Chem. (3/3 credits)
Chem. 324 — Organic Lab. (3 credits)
C.S. 202 — Computer Programming II (3 credits)
Geos. 304 — Geomorphology (3 credits)
Phys. 103-104 — College Physics (3 credits)
In addition, any electives needed to bring total credits to 130.

Management Option:

1. Take one of the following: (3 credits)	*Credits*
ALR 400 — Natural Resources Policies	3
ALR 401 — Natural Resources Legislation	3
2. Take four courses from the following: (12 credits)	
Geog. 302 — Geography of Alaska	3
Geog. 402 — Man and Nature	3
**J-B 101 — Intro. to Mass Communication	3
**J-B 311 — Magazine Article Writing	3
Anth. 242 — Native Cultures of Alaska	3
P.S. 201 — Comp. Politics: Methods of Political Analysis	3
P.S. 263 — Alaska Native Politics	3
P.S. 211 — State and Local Government	3
P.S. 212 — Intro. to Public Administration	3
P.S. 302 — Congress and Public Policy	3
Soc. 309 — Urban Sociology	3
B.A. 301 — Processes of Management	3
B.A. 361 — Personnel Managements	3
*Econ. 438 — The Economics of Fisheries Management	3
3. Take one of the following: (2-3 credits)	
W.F. 401 — Wildlife Management Techniques	3
W.F. 402 — Advanced Wildlife Biology & Management	3
W.F. 417 — Wildlife Management - Forest and Tundra	2
W.F. 419 — Wildlife Management - Wetlands	2
In addition, any electives needed to bring total credit hours to 130.	
Minimum credits required	130

*Note prerequisite.

**Maximum of 3 credits may be used to satisfy the management option.

Bachelor of science candidates are strongly urged to obtain work experience in fisheries-related positions with public resource agencies or private firms. Faculty members can help students contact potential employers. Fisheries undergraduate students will be asked each fall to describe their work experience of the previous year.

Fisheries Science — M.S. Degree

1. Complete general university requirements for master's degree, page 31.

2. The following core courses or their equivalent are required:

	Credits
W.F. 630 — Quantitative Fisheries Science	3
W.F. 625 — Fish Ecology *or* OCN 640 — Fishery Oceanography	3
W.F. 423 — Limnology *or* OCN 650 — Biological Oceanography	3

3. Soon after entering the degree program, students must select the thesis degree option or the non-thesis degree option. Once students declare the option a Graduate Advisory Committee will be appointed. All students are required to successfully complete the Graduate Comprehensive Examination.

3. Thesis Degree

In addition to the core courses, complete those as stipulated by the student's Graduate Advisory Committee and a thesis (W.F. 699) for a minimum total of 30 credits. At least 24 credits, including Thesis and/or Research, must be at the 600 level.

3b. Non-Thesis Degree

In addition to the core courses, complete 6 credit hours of research (W.F. 698) plus courses as stipulated by the student's Graduate Advisory Committee for a minimum total of 36 credits. At least 24 credits, including thesis and/or Research, must be at the 600 level. The research results will be written and reported in the format appropriate for a publication or technical report. This report will be submitted to the Graduate Committee for evaluation.

Graduate Study in Fisheries Biology

The wildlife and fisheries program offers graduate work leading to the master of science degree in fisheries biology. In exceptional cases an interdisciplinary doctor of philosophy degree can also be offered. Persons desiring detailed information on the graduate program in fisheries may obtain this from the head, Wildlife and Fisheries Program. The procedure to be followed in applying for admission to graduate study is outlined in the Graduate Admissions section of this catalog.

The program offers a limited number of research assistantships under various federal and state government funding programs. Graduate studies are also sponsored by the Alaska Cooperative Fishery Research Unit; inquiries should be directed to the unit leader.

General Science

Degrees: B.S., M.S.

Minimum Requirements for Degrees: B.S. — 130 credits; M.S. — 30 additional credits

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 borders between the older sciences provide excellent opportunity for research. An acquaintance with the fundamentals of all 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 disciplines.

Requirements

General Science — B.S. Degree

1. Complete the general university requirements as listed on page 29.

2. Complete the following degree and program (major) requirements:

First Year

Fall Semester — *17 credits*

Engl. 111 — Methods of Written Comm. 3
Math. 107-108 — Elementary Functions and Trigonometry 6
Chem. 105 — General Chemistry
or Phys. 103 — College Physics 4
Biol. 105 — Fundamentals of Biology 4

Spring Semester — *15 credits*

Speech Communication Elective 3
Math. 200 — Calculus 4
Chem. 106 — General Chemistry
or Phys. 104 — College Physics 4
Biol. 106 — Fundamentals of Biology 4

Second Year

Fall Semester — *17 credits*

Phys. 103 — College Physics
or Chem. 105 — General Chemistry 4
Econ. 201 — Principles of Economics I 3
Geos. 101 — 101L — General Geology 4
Psy. 101 — Intro. to Psychology 3
Department elective 3

Spring Semester — *16 credits*

Phys. 104 — College Physics
or Chem. 106 — General Chemistry 4
Geos. 112 — 112L — Historical Geology 4
Soc. 101 — Intro. to Sociology
or Anth. 101 — Introduction to Anthropology 3
Electives 5

Third and Fourth Years

By the beginning of his/her 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: *Credits*

Engl. 211 — Intermed. Exposition with Modes of Literature
or Engl. 213 — Intermed. Exposition 3
Social Science and/or Humanities electives (3 credits must be Humanities) 6

2. A major may be elected in anthropology, biological sciences, chemistry, geosciences, mathematics, or physics. Courses to be used to meet major requirements must be approved in writing not later than the beginning of the junior year and a copy of the approval must be filed with the Office of Admissions and Records. Although the minimum number of credits required for a general science major is 20, many of the majors require specific courses which total more than 20 credits. Therefore, a general science student should contact the head of the major department as early as possible to determine major requirements.

3. The electives must include either two minors of at least 12 credits each above the foundation courses included in the General Science curriculum, or a second major. Minors may be selected in any of the major departments listed or in the fields of economics, education (minimum 24 credits), English, French, German, Russian, history, or political science.

4. All prerequisites of courses elected must be met.

5. One year of German or Russian is recommended.

6. Courses selected to complete the requirements in the social sciences must be chosen from the following: anthropology except archeology; sociology; economics; history; and political science.

7. Physics 211-212 may alternate for Physics 103-104 and Chem. 301 may alternate for Chem. 105-106.

8. A minimum of 130 credits is required.

General Science — M.S. Degree

1. Complete the general university requirements and master's degree requirements, pages 29 and 31.

2. Complete a minimum of 30 credits of approved courses. At least 24 credits, including thesis and/or research, must be at the 600 level.

The Departments of Mathematics, Physics, Chemistry, Biological Sciences and Geology offer work toward the master of science degree with a major in general science. This degree may be described as a "breadth" rather than a "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; each course should contribute to the specific aim of the candidate, and the thesis or project should reflect this aim.

Geology and Geophysics

Degrees: B.S., M.S., M.A.T., Ph.D.

Minimum Requirements for Degrees: B.S. — 130 credits plus 6 credits in summer field courses; M.S. — 30 additional credits, including thesis; M.A.T. — 36 additional credits; Ph.D. (open)

Graduates in geology will have broad backgrounds in the earth sciences with firm foundations in mathematics, physics, and chemistry. There are many options available in the geological sciences, and the suggested curricula are intended to be flexible enough to allow the students to pursue their own emphases in the junior and senior years. The bachelor's degree should prepare one for positions with industry or government or for graduate studies. Graduate programs are tailored around minimal core course requirements (M.S. only) to the special research and study interest of the student. In addition to courses listed under the geology and geophysics program, students should check the course listings under the School of Mineral Engineering and the Marine Science program.

All serious students of the geological sciences at UAF should note that in addition to the facilities available directly through the instructional program, there are active research laboratories in the fields of seismology, volcanology, paleomagnetism, isotope geochronology, glaciology and ice physics which are housed in the Geophysical Institute (see also Geophysical Institute under Research, p. 54). These laboratories can frequently provide topics for M.S. and Ph.D. theses. Other laboratories are also available in other divisions on campus, as listed under Research. There are about 40 professional geoscientists in residence on campus, and graduate students normally participate in the ongoing research of these professionals. Similar possibilities exist for the motivated undergraduate.

Faculty

Department Head and Professor of Geology: Don M. Triplehorn

GEOLOGY FACULTY

Professors: Richard C. Allison, Daniel B. Hawkins, David M. Hopkins, Donald L. Turner
Associate Professors: Lewis H. Shapiro, Samuel E. Swanson
Assistant Professors: James E. Beget, R. Keith Crowder, Rainer J. Newberry
Adjunct Faculty: John Decker, John T. Dillon, Charles G. (Gil) Mull, Richard D. Reger, Thomas E. Smith, Milton A. Wiltse

GEOPHYSICS FACULTY

Professors: Carl S. Benson, Nirendra Biswas, William P. Harrison, Juergen Kienle, Thomas E. Osterkamp, David B. Stone, Eugene M. Wescott
Associate Professors: Larry D. Gedney, Hans Pulpan, William M. Sackinger, William J. Stringer
Assistant Professors: Joan P. Gosink, Koji Kawasaki

Adjunct Faculty: John Davies

Requirements

Geology — B.S. Degree

1. Complete the general university requirements as listed on page 29.

2. Complete the following degree and program (major) requirements:

	Credits
Engl. 111 — Methods of Written Communication	3
Engl. 211 — Intermed. Expos. with Modes of Literature *or* Engl. 213 — Intermed. Exposition or Engl. 311 — Adv. Exposition	3
Speech Communications Elective	3
Social Science (minimum of 3 credits) and Humanities (minimum of 3 credits), exclusive of 9 credit communications requirement	15
Math. 200-201 — Calculus, A.S. 301 — Elem. Probability and Stat. *and* A.S. 401 — Experimental Design and Regression *or* A.S. 402 — Scientific Sampling; *or* Math 200, 201, 202 — Calculus, Math 302 — Differential Equations (Math 200, 201, 202, 302 required for the Geophysics Option)	15
Phys. 211-212 — General Physics (Phys. 103-104 may be taken for General Geology Option)	8
Chem. 105-106 — General Chemistry	8
Biol. 103 — Biology and Man or other approved biology elective	4
E.S. 201 — Computer Techniques *or* C.S. 201 — Computer Programming	3

3. For General Geology, Economic Geology and Petroleum Geology options, complete the following requirements:

Core Courses:	Credits
Geos. 101 — General Geology	3
Geos. 101L — General Geology Lab	1
Geos. 112 — Historical Geology	3
Geos. 112L — Historical Geology Lab	1
Geos. 213 — Mineralogy	4
Geos. 214 — Petrology	3
Geos. 314 — Structural Geology	3
Geos. 316 — Optical Mineralogy and Petrography	4
Geos. 321 — Sedimentology	3
Geos. 322 — Stratigraphic Principles	4
Geos. 350 — Geologic Field Methods	2
Geos. 351 — Field Geology	6
Geos. 401 — Invertebrate Paleontology	4
Geos. 408 — Map and Air Photo Analysis	2
Geos. 417 — Intro. to Geochemistry	3

In addition, complete one of the three options below:

General Geology Option:	Credits
Geos. 304 — Geomorphology	3
Geos. 418 — Basic Geophysics	3
Electives (professional and general)	22
Total	136

Economic Geology Option:	Credits
Geos. 304 — Geomorphology	3
Geos. 407 — Geology of Mineral Resources	4
Two of the following	5-6
Min. 202 — Mine Surveying (3 credits)	
M. Pr. 304 — Intro. to Metallurgy (3 credits)	
M. Pr. 313 — Intro. to Mineral Preparation (3 credits)	
Min. 407 — Mineral Industry and the Environment (2 credits)	
Min. 408 — Mineral Valuation and Economics (3 credits)	
G.E. 365 — Geological Engineering I (3 credits)	
One set of the following:	
G.E. 405 — Exploration Geophysics (4 credits)	
or	
Geos. 418 — Basic Geophysics (3 credits)	
or	
Geos. 410 — Potential Methods in Geophysics (2 credits) *and* Geos. 412 — Electrical Methods in Geophysics (2 credits)	3-4
Electives (professional and general)	11-13
Total	136

Petroleum Geology Option:	Credits
Pet. E. 205 — Intro. to Petroleum Drilling and Production	3
Pet. E. 302 — Well Logging	3
Geos. 411 — Seismic Exploration	2
Geos. 410 — Potential Methods in Geophysics or Geos. 412 — Electrical Methods in Geophysics	2
Electives (professional & general)	18
Total	136

4. For the Solid Earth Geophysics Option, complete the following requirements:

	Credits
Geos. 101 — General Geology	3
Geos. 101L — General Geology Lab	1
Geos. 213 — Mineralogy	4
Geos. 214 — Petrology	3
Geos. 314 — Structural Geology	3
Geos. 351 — Field Geology*	4
Geos. 430 — Statistics and Data Analysis	3
Math. 421 — Applied Analysis I	4
Math. 422 — Applied Analysis II	4
Phys. 311 — Mechanics I	3
Phys. 331 — Electricity and Magnetism	3
Geos. 411 — Seismic Exploration	2
Geos. 410 — Potential Methods in Geophysics	2
Geos. 412 — Electrical Methods in Geophysics	2
Geos. 418 — Basic Geophysics	3
Geos. 451 — Field Geophysics	2
Pet.E. 302 — Well Logging	3
Thirteen credits from the following	13
Geos. 112-112L — Historical Geology & Lab (4)	
Geos. 321 — Sedimentology (3)	
Geos. 322 — Stratigraphic Principles (4)	
Geos. 417 — Geochemistry (3)	
Phys. 312 — Mechanics II (4)	
Phys. 313 — Thermodynamics & Stat. Physics (4)	
Phys. 332 — Electricity and Magnetism (3)	
Electives (professional and general)	11
Total	136

*Geos. 351 can be waived as a requirement if suitable field experience can be demonstrated.

Minor in Geology:

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

Geology — M.S. Degree*

1. Complete the general university requirements and master's degree requirements, pages 29 and 31.

2. Complete a minimum of 30 credits, including a maximum of 6 credits of thesis (Geos. 699) and 6 credits of individual research (Geos. 698). At least 24 credits (including thesis and research) must be at the 600 level, and at least 15 credits from coursework (exclusive of thesis and research) must be at the 600 level.

Options:

A. General Geology Option: Complete at least one course from each of the three core areas — advanced structural geology, advanced petrology, and advanced stratigraphy.

B. Economic Geology Option: Complete 9 credits in applied geoscience with at least one course in mineral economics or engineering management.

C. Petroleum Geology Option: Complete at least one course each in advanced structural geology, advanced stratigraphy, advanced sedimentology, and a geophysics course approved by the graduate advisory committee.

Geophysics — M. S. Degree*

1. Complete the general university requirements and master's degree requirements, pages 29 and 31.

2. Complete a minimum of 30 credits, including a maximum of 6 credits of thesis (Geos. 699) and 6 credits of individual research (Geos. 698). At least 24 credits (including thesis and research) must be at the 600 level,

and at least 15 credits from coursework (exclusive of thesis and research) must be at the 600 level.

Options:

A. Solid-Earth Geophysics Option: In addition to geophysics courses, the graduate advisory committee will require a selection of advanced courses in both geology and physics, the actual courses depending on how far the student's degree work is biased towards one discipline or the other.

B. Snow, Ice and Permafrost Geophysics Option: The student's graduate advisory committee will require a selection of advanced courses in ice, snow and permafrost studies and either geology, applied science and engineering, physics, or meteorology/oceanography (climate), depending on how far the student's degree is biased toward one given discipline.

*To be admitted, the student is expected to have a background at least to the level of that listed for the relevant B.S. option in Geology and Geophysics. However, deficiencies can be made up concurrently with the degree program. Acceptance for the snow, ice, and permafrost geophysics option is not limited to those with a geoscience background; students with strong physical science or engineering backgrounds are also encouraged to apply.

Geology — M.A.T. Degree
Contact the head of the department for degree requirements.

Geology — Ph.D. Degree
Geophysics — Ph.D. Degree
1. Complete the general university requirements for graduate students and Ph.D. degree requirements, pages 29 and 34.
2. Complete required program as arranged by conference with the graduate advisory committee.

Health Sciences — Preprofessional Curricula

Professional schools of medicine and dentistry as well as many of the professional schools in paramedical fields (e.g., medical technology, physical therapy) require one to four years of collegiate work before a student will be admitted. These years of preliminary academic work may be taken at UAF, where the students follow a sequence of courses planned to meet the requirements of the particular professional field in which they are interested. Students interested in health professions should contact the health sciences preprofessional adviser, before registering.

Most premedical students plan on four preliminary years. The students are encouraged to develop their major area of interest, be it either in natural or social sciences or in the humanities. In preparation for medical school the student must gain a thorough understanding of the modern concepts in biology, chemistry, and physics. Students are encouraged to include chemistry and either physics or biology in their freshman course of study. Usually students at UAF follow a curriculum leading to a bachelor of science degree with a major in biological sciences or chemistry, earning a bachelor's degree at the end of four years. Adjustments may be made to meet varying requirements. Premedical students who are accepted in medical school prior to finishing their degree and who wish to receive a bachelor's degree from UAF may obtain from the health sciences preprofessional adviser, a description of the requirements which must be completed.

Interdisciplinary Studies

The College of Natural Sciences offers a variety of interdisciplinary degrees in biological sciences, wildlife management and fisheries. For further information about the interdisciplinary studies program, see page 84.

Marine Sciences and Limnology

Degrees: M.S., Ph.D.
Minimum Requirements for Degree: M.S. 30 credits (beyond a bachelor's degree)

A graduate curriculum in marine sciences is offered by the Marine Sciences and Limnology Department in the College of Natural Sciences. The purpose of the curriculum is to provide academic opportunities for students seeking M.S. and Ph.D. degrees in oceanography and marine biology. At the M.S. level, the curriculum emphasizes ocean related course work in the various disciplines of oceanography (physical, biological, chemical, geological and fisheries) and marine biology. Additional courses are selected from the university curriculum at large to assure a high level of competence in the student's area of major interest.

Working in cooperation with the Institute of Marine Science, graduate students are afforded excellent opportunities for field and laboratory research through association with a large staff of oceanographers and marine biologists. Oceanographic studies are carried out aboard the research vessel *Alpha Helix*, while laboratory research is conducted at the Seward Marine Center and on the Fairbanks campus.

Graduate students are admitted on the basis of their ability and the capability of the Marine Sciences and Limnology Department to meet their particular needs. Each application is reviewed by the department faculty. Requests for admission are considered throughout the year. Stipends for student support are awarded on a competitive basis.

Faculty

Marine Sciences and Limnology Department

Department Head and Associate Professor of Marine Science: R. Theodore Cooney

Professors: Vera Alexander, David C. Burrell, Don K. Button, Robert Elsner, Francis H. Fay, Howard M. Feder, John J. Goering, C. Peter McRoy, William S. Reeburgh, Thomas C. Royer, David G. Shaw

Associate Professors: Raymond C. Highsmith, John J. Kelley, Zygmunt Kowalik, A. Sathy Naidu, H. Joseph Niebauer, Tsuneo Nishiyama, Donald M. Schell.

Assistant Professors: Susan M. Henrichs, Walter R. Johnson, George W. Kipphut

Requirements

Oceanography — M.S. Degree

1. Complete the general university requirements and master's degree requirements, pages 29 and 31.

2. Complete a minimum of 30 credits including OCN 620, 630, 650 and 660 (or equivalents) and two semesters of OCN 692. Fisheries oceanographers will take OCN 640 and any three of the above courses. At least 24 credits, including thesis and/or research, must be at the 600 level.

3. Field experience aboard an oceanographic vessel is expected of oceanography majors.

Marine Biology — M.S. Degree

1. Complete the general university requirements and master's degree requirements, pages 29 and 31.

2. Complete a minimum of 30 credits including OCN 610, OCN 650 (or equivalent) plus six additional credits in oceanography, biology or marine ecology and two semesters of OCN 692. At least 24 credits, including thesis and/or research, must be at the 600 level.

Oceanography — Ph.D. Degree

There are no fixed course requirements, nor is an M.S. degree required to obtain the Ph.D. degree. This degree is awarded for proven ability and scholarly attainment and each candidate's program is planned with his or her graduate advisory committee. A candidate for the Ph.D. degree in the marine science program will be expected to have course work at least equivalent to that required for the M.S. degree.

Medical Technology

University of Alaska/University of Washington Cooperative Program

Students may enroll for four semesters at UAF completing requirements noted below, then apply for acceptance into the professional phase of the Medical Technology Program at the University of Washington for an additional seven quarters. Up to four *bona fide* Alaska resident students will be accepted into the professional phase each year, if they qualify for admittance to the program. The B.S. degree is granted from the University of Washington.

Program requirements: 60 semester credits with a GPA of 3.00 including the following courses:

	Credits
Biol. 105-106 — Fundamentals of Biology I and II	8
Biol. 111-112 — Human Anatomy and Physiology or Biol. 210 — Animal Physiology and Biol. 317 — Comp. Anatomy of Vertebrates	8 or 9
Biol. 343 — General Bacteriology	5
Chem. 105-106 — General Chemistry	8
Chem. 212 — Quantitative Analysis	4
Chem. 321-322-324 — Organic Chemistry and Lab	9
Math. 271-272 or A.S. 301 — Calculus; Statistics	7 or 8
Engl. 111-211 or 213 — Written Communication	6
Sp.C. 121 — Fundamentals of Oral Comm: Interpersonal	3
Social Science elective — 3 credits, Humanities elective — 3 credits, other electives — 8-9 credits	

For information on application procedures to the University of Washington and the Medical Technology Program contact the Health Professions Adviser, University of Alaska-Fairbanks, Fairbanks, Alaska 99701.

Medical Sciences

Medical Sciences
Washington, Alaska, Montana, and Idaho
Medical Education Program (WAMI)

In September 1971, the University of Alaska-Fairbanks started a unique collaborative program for decentralizing portions of the educational and training program of the University of Washington School of Medicine. Resident Alaskan students now have an opportunity to pursue medicine and are exposed to Alaskan medicine early in their careers.

Students formally enrolled in the WAMI Program must first have been admitted as Alaska WAMI applicants to the freshman class of the University of Washington School of Medicine in Seattle as candidates for the doctoral degree in medicine and are, therefore, admitted to both universities. After the students complete the year's medical courses in Fairbanks, they study in Seattle until their junior or senior year, when they become eligible for community-based clinical clerkships with practicing physicians in one of the four WAMI states. This decentralized instruction in both the basic science (freshman and sophomore) and clinical (primarily junior and senior) years of medical school is designed to encourage physicians to consider practice in smaller communities.

All but one of the medical science courses listed in this catalog are taught at an advanced level (graduate equivalent) and are intended primarily for WAMI medical students. However, some of the courses are open to qualified students in good standing, subject to conditions listed for each course and with permission of the course chairman. A refundable $75 equipment security fee is collected from the WAMI medical students at registration.

For further information about the WAMI Medical Education Program contact the WAMI Medical Education Program, University of Alaska-Fairbanks, Fairbanks, Alaska 99701.

Faculty

WAMI Medical Education Program

Acting Director and Associate Professor: Raymond P. Bailey
Professor: Philip O. Nice
Associate Professors: Kenneth Kastella, Betty Anne Philip
Instructor: Cheryl Roussain-Nice
Adjunct Faculty: E. Leanne Converse, David Grauman, Aaron Wolf, John Wreggit
Affiliate Faculty: C. Earl Albrecht, Elizabeth Elsner, Daniel Failoni, James Gollogly, Richard Raugust

Physics

Degrees: B.A., B.S., M.S., M.A.T., Ph.D.

Minimum Requirements for Degrees: B.A. — 130 credits; B.S. — 130 credits; M.S. — 30 additional credits; M.A.T. — 36 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 of work in all fields of physical science and engineering, and contributes to other fields such as biology and medicine.

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 offers ample thesis material in the fields of the atmospheric and space sciences, experimental atomic and molecular physics, and in solid earth physics. The research program of the Geophysical Institute currently emphasizes investigations of auroral, ionospheric and magnetospheric physics, and physics and chemistry of the upper and middle atmosphere, geomagnetism and earth currents, radio wave propagation and scattering, solar-terrestrial relations, polar meteorology and glaciology, seismology and solid earth physics, and laboratory studies of atomic and molecular processes.

A graduate student may designate his/her major field as physics, space physics or geophysics. He/she will pursue his/her studies under the supervision of an advisory committee. The committee advises on the course of study to be followed and determines the background courses (mathematics, physics, astronomy, chemistry, geoscience) necessary to support the major field.

Faculty

Department Head and Associate Professor: John S. Murray
Professors: John L. Morack, J. Roger Sheridan, Gulamabas Sivjee

Requirements

Physics — B.A. Degree

1. Complete the general university requirements and B.A. degree requirements, page 29.

2. Complete the following program (major) requirements:

Complete the foundation courses:	*Credits*
Phys. 211-212 — General Physics	8
Phys. 213 — Elementary Modern Physics	3

Complete a minor in mathematics, which includes Math. 200-201-202, and 6 credits at the 300-level or above.
Complete 20 additional credits of approved courses in physics.

3. Minimum credits required 130

Applied Physics — B.S. Degree

1. Complete the general university requirements and B.S. degree requirements, pages 29 and 30.

2. Complete the following program (major) requirements:
Complete Math. 200-201-202, 302 and 9 additional credits in mathematics at the 200-level or above.
*Complete Phys. 213, 311, and 331 and 12 additional credits in physics at the 300-level or above.
Complete 20 approved credits** in a chosen subject area of applied physics.

3. Minimum credits required 130

*Implicit in this requirement are 8 credits of lower-division physics courses which are prerequisites for these courses.
**These credits must be approved before the beginning of the student's final semester by the head of the Physics Department.

Physics — B.S. Degree

1. Complete general university requirements and B.S. degree requirements, pages 29 and 30.

2. Complete the following program (major) requirements:
Math. 200-201-202, 302 and 9 additional credits at the 300-level or above.
Phys. 211-212, 213, 311-312-313, 331-332, 411-412, 381, 382, 445 and 462.

3. Minimum credits required 130

Suggested Curriculum

First Year

Fall Semester	*16 credits*
Engl. 111 — Methods of Written Comm	3
E.S. 201 — Computer Techniques	3
Math. 200 — Calculus	4
Chem. 105 — General Chemistry	4
Free electives	2
Spring Semester	*17 credits*
Speech Communication Elective	3
Phys. 211 — General Physics	4
Math. 201 — Calculus	4
Chem. 106 — General Chemistry	4
Free electives	2

Second Year

Fall Semester	*16 credits*
Math. 202 — Calculus	4
Phys. 212 — General Physics	4
Engl. 211 — Intermediate Expos. with Modes of Lit. or Engl. 213 — Intermediate Exposition	3
Humanities/Social Science elective	3
Free electives	2
Spring Semester	*16 credits*
Math 302 — Differential Equations	3
Phys. 213 — Elementary Modern Physics	3
E.E. 481 — Electron. and Instr. for Sci. and Engr	3
Humanities/Social electives	6
Free electives	1

Third Year

Fall Semester	*17 credits*
Math. 421 — Applied Analysis I	4
Phys. 313 — Thermo. and Stat. Physics	4
Phys. 331 — Electricity and Magnetism	3
Phys. 381 — Physics Laboratory	2
Humanities/Social Science electives	3
Free elective	1
Spring Semester	*16 credits*
Math. 422 — Applied Analysis II	4
Phys. 445 — Solid State Physics and Physical Electronics	3
Phys. 332 — Electricity and Magnetism II	3
Phys. 382 — Laboratory	2
Humanities/Social Science electives	3
Free elective	1

Fourth Year

Fall Semester	*15 credits*
Phys. 411 — Modern Physics	4
Phys. 311 — Mechanics I	4
Math. elective	3
Free electives	4
Spring Semester	*16 credits*
Phys. 412 — Modern Physics	4
Phys. 312 — Mechanics II	4
Free electives	8

A minor in Physics requires 12-16 credits.

Physics — M.S. Degree

1. Complete the general university requirements and master's degree requirements, pages 29 and 31.

2. Complete a minimum of 30 credits of approved courses, including Phys. 699, Thesis. At least 24 credits, including Thesis and/or Research, must be at the 600 level.

Physics — M.A.T. Degree

Persons interested in this degree program should see the head of the department.

Physics — Ph.D. Degree

Complete the general university requirements and Ph.D. requirements, pages 29 and 34.

Space Physics and Atmospheric Sciences Program

Degrees: M.S., Ph.D.
Minimum Requirements for Degrees: M.S., 30 credits beyond B.S.; Ph.D., no fixed credit

The space physics and atmospheric sciences program is a graduate program that is intimately connected with the research activities of the Geophysical Institute, which offers ample thesis material in the fields of space physics and atmospheric science. The research program of the Geophysical Institute currently emphasizes investigations of auroral, ionospheric and magnetospheric physics, geomagnetism and earth currents, radio wave propagation and scattering, solar-terrestrial relationships, aeronomy, laboratory studies of atomic and molecular processes, solar radiation, cloud physics, atmospheric boundary layer, aerosols and solar weather interaction, with emphasis on higher latitudes.

Faculty

Program Head and Assistant Professor of Geophysics: John V. Olson
Professors: Syun-Ichi Akasofu, Charles S. Deehr, Robert D. Hunsucker, Kolf Jayaweera, Joseph R. Kan, Robert P. Merritt, John L. Morack, Takeshi Ohtake, Manfred H. Rees, Gerald J. Romick, Glenn E. Shaw, Roger J. Sheridan, Daniel W. Swift, Gunter E. Weller, Gerd D. Wendler, Tunis Wentink, Jr., Eugene M. Wescott, Charles R. Wilson.
Associate Professors: Vladimir Degen, Thomas J. Hallinan, Hans C.S. Nielsen.
Assistant Professors: Sue Ann Bowling, Neal B. Brown, David C. Fritts, Lou-Chuang Lee, Brenton J. Watkins.

GEOPHYSICAL INSTITUTE
Director: Juan G. Roederer

Requirements

Space Physics — M.S. Degree
1. Complete the general university requirements and the master's degree requirements, pages 29 and 31.
2. Complete a minimum of 30 credits of approved courses including:

	Credits
Basic courses in space physics	12
Approved physics courses (minimum)	12

Atmospheric Sciences — M.S. Degree
1. Complete the general university requirements and the master's degree requirements, pages 29 and 31.
2. Complete a minimum of 30 credits of approved courses including:

	Credits
Basic courses in atmospheric sciences	12
Approved Physics courses (minimum)	12

Specialization in ice and snow studies with emphasis on ice physics, ice in climate and ice in science applications is available through the Geology/Geophysics Program (see Ice and Permafrost Geophysics Option).

Space Physics — Ph.D. Degree
1. Complete the general university requirements and Ph.D. requirements, pages 29 and 34.
2. Complete the following:

	Credits
Basic courses in space physics	12
Approved physics courses (minimum)	12

Atmospheric Sciences — Ph.D. Degree
1. Complete the general university requirements and Ph.D. requirements, pages 29 and 34.
2. Complete the following:

	Credits
Basic courses in atmospheric sciences	12
Approved physics courses (minimum)	12

(For specialization in ice and snow studies, see Geology/Geophysics Program, Ice and Permafrost Option.)

Basic courses in Space Physics:	Credits
SPAS 626 — Fundamentals of Plasma Physics	3
SPAS 627 — Advanced Plasma Physics	3
SPAS 640 — Auroral Physics	3
SPAS 650 — Aeronomy	3
SPAS 672 — Magnetospheric Physics	3
SPAS 673 — Space Physics	3

Basic courses in Atmospheric Sciences:	
SPAS 636 — Physics of the Lower Atmosphere	3
SPAS 646 — Dynamics of the Atmosphere and Ocean	3
SPAS 650 — Aeronomy	3
SPAS 656 — Atmospheric Circulation, Weather, and Climate	3

The physics courses which are integral parts of the SPAS program are listed below:

Physics Courses:	
Phys. 611 — Mathematical Physics	3
Phys. 612 — Mathematical Physics	3
Phys. 621 — Classical Mechanics	3
Phys. 622 — Statistical Mechanics	3
Phys. 631 — Electromagnetic Theory	3
Phys. 632 — Electromagnetic Theory	3
Phys. 651 — Quantum Mechanics	3
Phys. 652 — Quantum Mechanics	3

Wildlife Management

Degrees: B.S., M.S., Ph.D. (interdisciplinary)
Minimum Requirements for Degrees: B.S., 130 credits; M.S., 30 additional credits

The undergraduate curricula in the program in wildlife are intended to provide basic education and training. Two options are available: a wildlife research biologist option and a wildlife management biologist option. The research biologist option is designed for those students whose objective is to undertake the field and laboratory research needed to provide additional information on the workings of wild animal populations, the condition of their habitat, and the habitat-animal relationships. The management biologist option is designed for those students whose primary interests involve the interpretation, application, or dissemination of research findings, rather than their acquisition. That option is appropriate for those students contemplating careers in wildlife agency administration, in developing and implementing wildlife management plans and in public information and education. The curricula in both options provide a solid foundation for graduate study.

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, the Alaska Cooperative Fishery Research Unit and 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.

Faculty

Wildlife Program

Head, Department of Biology, Fisheries and Wildlife and Professor: Stephen F. MacLean, Jr.
Program Head and Professor: Robert B. Weeden
Professors: Frederick C. Dean, Robert A. Dieterich, David R. Klein, Robert G. White
Associate Professor: Peter G. Mickelson

Alaska Cooperative Wildlife Research Unit

Unit Leader: David R. Klein

Requirements

Wildlife Management — B.S. Degree
(Research Biologist Option)

1. Complete the general university requirements as listed on page 29 and 30.
2. Complete the following degree and program (major) requirements:

Courses	Credits
A.L.R. 101 — Conservation of Natural Resources	3
A.L.R. 380 — Soils	3
A.S. 301 — Elementary Probability and Statistics	3
A.S. 402 — Scientific Sampling	3
Biol. 105-106 — Fundamentals of Biology	8
Biol. 205 — Vertebrate Anatomy or Biol. 317 — Comp. Anatomy	3-4
*Biol. 210 — Animal Physiology	4
*Biol. 239 — Plant Form and Function	4
Biol. 271 — Principles of Ecology	4
Biol. 331 — Systematic Botany	4
Biol. 423 — Ichthyology (4) Biol. 425 — Mammalogy (3) Biol. 426 — Ornithology (3) } Select 2 of 3	6-7
Biol. 471 — Population Ecology	3
Biol. 472 — Communities and Ecosystems	3
Chem. 105-106 — General Chemistry	8
Econ. 235 — Introduction to Natural Resource Economics	3
Engl. 111 — Methods of Written Communication	3
Engl. 213 — Intermediate Exposition	3
Engl. 414 — Research Writing	3
Math. 272-273 — Introduction to Calculus for the Life Sciences	6
Phys. 103-104 — College Physics	8
Sp. Comm. — Elective	3
W.F. 301 — Principles of Population Dynamics and Management	3
W.F. 333 — Literature of Ecology and Resource Management	2
W.F. 401 — Wildlife Management Techniques	3
W.F. 402 — Wildlife Biology and Management	3
W.F. 423 — Limnology	3
Total	102-104

In addition:

1. Complete the remainder of the B.S. social sciences/humanities requirement, 9 credits.
2. Complete sufficient electives to bring total to 130 credits.
3. Bachelor of science candidates are strongly urged to obtain work experience in wildlife-related positions with public resource agencies or private firms. Faculty members can help students contact potential employers.

*Note prerequisite.

Wildlife Management — B.S. Degree
(Management Biologist Option)

1. Complete the general university requirements as listed on page 29 and 30.
2. Complete the following degree and program (major) requirements:

Courses	Credits
A.L.R. 101 — Conservation of Natural Resources	3
A.L.R. 380 — Soils	3
A.L.R. 400 — Natural Resource Policies	3
A.L.R. 430 — Land-Use Planning	3
A.S. 301 — Elementary Probability and Statistics	3
Biol. 105-106 — Fundamentals of Biology	8
Biol. 205 — Vertebrate Anatomy	3
*Biol. 210 — Animal Physiology	4
*Biol. 239 — Plant Form and Function	4
Biol. 271 — Principles of Ecology	4
Biol. 331 — Systematic Botany	4
Biol. 425 — Mammalogy or Biol. 426 — Ornithology	3
Biol. 471 — Population Ecology	3
Biol. 472 — Communities and Ecosystems	3
Chem. 105-106 — General Chemistry	8
Econ. 235 — Introduction to Natural Resource Economics	3
Econ. 335 — Intermediate Natural Resource Economics	3
Engl. 111 — Methods of Written Communication	3
Engl. 213 — Intermediate Exposition	3
Engl. 414 — Research Writing	3
Math. 272-273 — Introduction to Calculus for the Life Sciences	6
Phys. 103-104 — College Physics	8
Sp. Comm. — Elective	3
W.F. 301 — Principles of Population Dynamics and Management	3
W.F. 333 — Literature of Ecology and Resource Management	2
W.F. 401 — Wildlife Management Techniques	3
W.F. 402 — Wildlife Biology and Management	3
W.F. 423 — Limnology	3
Total	105

In addition:

1. At least 9 credits must be completed from this group:

Geog. 302 — Geography of Alaska	3
Geog. 402 — Man and Nature	3
**J-B 102 — Broadcasting and Society	3
**J-B 301 — Basic Newsgathering and Processing	3
**J-B 203 — Basic Photography	3
J-B 311 — Magazine Article Writing	3

*Note prerequisite.
**Maximum of 3 credits may be included in the required 9.

Phil. 320 — Axiology	3
P.S. 101 — Introduction to American Government	3
P.S. 201 — Comp. Politics: Methods of Political Analysis	3
P.S. 263 — Alaska Native Politics	3
P.S. 301 — Public Admin. in Political Process	3
Psy. 101 — Introduction to Psychology	3
Soc. 101 — Introduction to Sociology	3
Soc. 102 — Introduction to Sociology	3
Soc. 309 — Urban Sociology	3

2. At least 1 of the following courses must be included:

A.L.R. 350 — Introduction to Forest System	3
A.L.R. 460 — Principles Outdoor Recreation Management	3
A.L.R. 450 — Forest Management	3
A.L.R. 370 — Introduction to Watershed Science	3

3. At least 2 of the following courses must be included:

W.F. 417 — Wildlife Management — Forest and Tundra	2
W.F. 419 — Wildlife Management — Wetlands	2
W.F. 429 — Introduction to Fisheries Science	3
W.F. 430 — Fisheries Management	3
W.F. 436 — Introduction to Aquaculture	3

4. Complete sufficient electives to bring total credits to 130.

Bachelor of science candidates are strongly urged to obtain work experience in wildlife-related positions with public resource agencies or private firms. Faculty members can help students contact potential employers.

The wildlife and fisheries program and the Alaska Cooperative Wildlife Research Unit cooperate in offering graduate work leading to the master of science degree. An interdisciplinary doctor of philosophy degree can also be offered. Persons desiring detailed information on the graduate program in wildlife management may obtain this from the head, wildlife and fisheries program. The procedure to be followed in applying for admission to graduate study is outlined in the section on Graduate Admissions 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-Fairbanks, Fairbanks, Alaska. Applications for these assistantships should be sent to the unit leader; such applications are supplementary to the application for admission for graduate study.

Wildlife Management — M.S. Degree

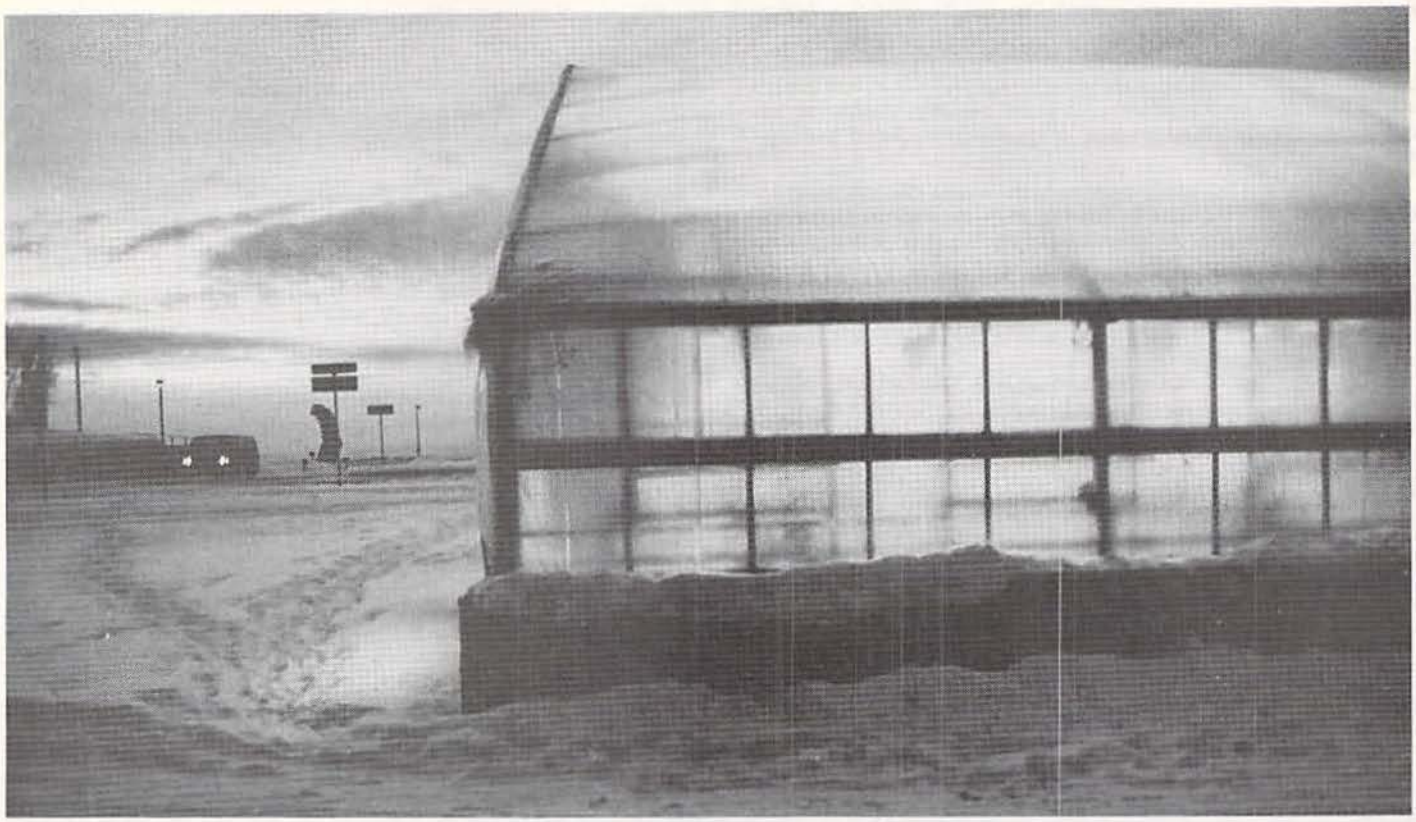
1. Complete the general university requirements and master's degree requirements, pages 29 and 31.

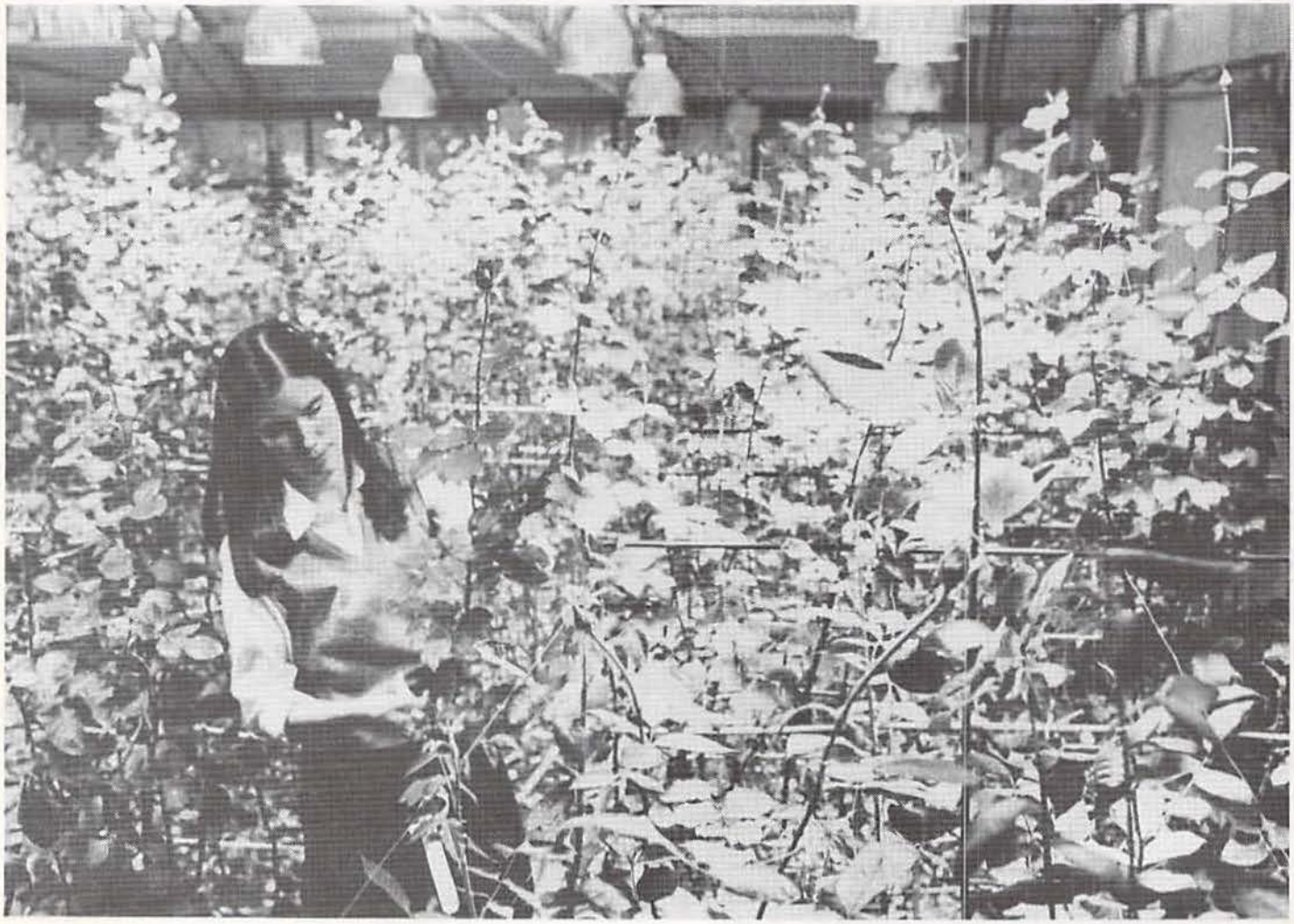
2. Complete a minimum of 30 credits of approved courses, including W.F. 699 — Thesis, in the field of wildlife management. At least 24 credits, including thesis and/or research, must be at the 600 level.

3. Students working in subject areas involving significant non-English literature will be expected to read the appropriate foreign language.

Wildlife Management — Interdisciplinary Ph.D. Degree

See pages 29 and 34 for degree requirements.





School of Agriculture and Land Resources Management

The School of Agriculture and Land Resources Management is composed of the Agricultural and Forestry Experiment Station and the Instruction and Public Service Division. The former includes stations at Fairbanks, Palmer and the Forest Soils Laboratory at Fairbanks. Research in many aspects of agriculture, forestry, outdoor recreation, water resource management, soils, park and wilderness management, and resource planning and administration is carried on by faculty of the school.

The Instruction and Public Service programs include degree programs in natural resources management, cooperative programs in rural education and in forest and reindeer industry extension, and demonstration studies in intensive forestry. The courses and programs were developed in close cooperation with many university units and non-university agencies and groups.

State and federal agencies which significantly contribute to the programs by providing guest lecturers, work with graduate students and internship/field work experience for students are the Alaska Department of Natural Resources, Agricultural Research Service, U. S. Forest Service, the Bureau of Land Management, Soil Conservation Service, Alaska Department of Fish and Game, Fairbanks North Star Borough, Alaska Association of Soil Conservation Subdistricts, and U. S. Fish and Wildlife Service.

Undergraduate Degrees — Bachelor of science in natural resources management, natural resources management/forestry, and natural resources management/agriculture.

Graduate Degree — Master of science in natural resources management; interdisciplinary degrees are possible for some students desiring more specialized degrees especially in the agricultural sciences.

Faculty

Administration

Dean of the School of Agriculture and Land Resources Management and Director of the Agricultural and Forestry Experiment Station: James V. Drew

Director of Instruction and Public Service and Professor of Land Resources and Botany: Bonita J. Neiland

Assistant Director, Agricultural and Forestry Experiment Station Palmer: Sigmund H. Restad

Agricultural and Forestry Experiment Station — Fairbanks

Dean of School, Director, AFES, and Professor of Agronomy: James V. Drew
Assistant Professor of Range Management: William B. Collins
Assistant Professor of Agricultural Engineering: Robert F. Cullum
Professor of Natural Resources: Alan C. Epps
Assistant Professor of Plant Physiology: Marilyn Griffith
Associate Professor of Animal Science: Fredric M. Husby
Associate Professor of Resource Management: Alan Jubenville, Carol E. Lewis
Visiting Associate Professor of Plant Ecology: Glenn Juday
Instructor of Agronomy: Charles W. Knight
Visiting Assistant Professor of Microbiology: Gary A. Laursen
Assistant Professor of Plant Pathology: Jenifer H. McBeath
Assistant Professor of Forest Management: Edmond C. Packee
Assistant Professor of Agronomy: Stephen D. Sparrow
Professor of Economics: Wayne C. Thomas
Professor of Forestry: Keith Van Cleve
Professor of Agronomy: Frank J. Wooding
Associate Professor of Economics: William G. Workman
Visiting Assistant Professor of Forest Soils: John A. Yarie

Agricultural and Forestry Experiment Station — Palmer

Assistant Director: Sigmund H. Restad
Associate Professor of Agricultural Engineering: Lee D. Allen
Instructor of Animal Science: Leroy Ben Bruce
Assistant Professor of Horticulture: Donald E. Carling
Professor of Agronomy: Leslie J. Klebesadel
Associate Professor of Agronomy: Jay D. McKendrick
Professor of Agronomy: William W. Mitchell
Assistant Professor of Agronomy: Chien-Lu Ping
Professor of Agronomy: Roscoe L. Taylor
(Agricultural Research Service personnel with experiment station)
Research Soil Scientist: Winston M. Laughlin (Palmer)
Research Weed Scientist: Jeffery Conn (Fairbanks)

Instruction and Public Service

Director of Instruction and Public Service, and Professor of Botany and Land Resources: Bonita J. Neiland
Assistant Professor of Land Resources: John D. Fox
Professor of Resource Management: Robert B. Weeden
Research Associate: Allen J. Richmond
Assistant Professor of Agriculture Education: Carla A. Kirts
Assistant Professor of Regional and Land Use Planning: Thomas J. Gallagher
Assistant Professor of Horticulture: Patricia S. Holloway
Instructor of Forest Management and Extension Forester: Anthony F. Gasbarro
Associate Professor of Resource Management: Alan Jubenville

Natural Resources Management

Degrees: B.S., M.S.
Minimum Requirements for Degree: B.S. — 130 credits; M.S. — 30-35 credits

The basic natural resources management curriculum is designed to provide students with a broad education in the various natural resources and their related applied fields. Programs can be tailored to specific interests of students and can combine the natural resources basic program with such fields as education, communications or political science or with greater depth in natural science and resources. The curricula for the B.S. in natural resources management/forestry and the B. S. in natural resources management/agriculture degrees are designed to provide the same basic science background and much the same basic resource background as the general degree, but, in addition, include greater depth in either forestry or agriculture. (The NRM/forestry degree *is not* equivalent to an accredited B. S. in forestry degree.)

Practical experience, "hands on" field and laboratory activities and applied aspects are stressed throughout the program. Internships and work-study arrangements are often available—with or without credit, with or without pay—for qualified students.

Requirements

Courses required for the majors may also be used to satisfy the general university requirements as appropriate.

Natural Resources Management — B.S. Degree

1. Complete general university requirements and B.S. degree requirements, pages 29 and 30.

2. Complete the following program (major) requirements:

	Credits
Biol. 105-106 — Fundamentals of Biology, I and II	8
Biol. 271 — Principles of Ecology	4
Chem. 105-106 — General Chemistry	8
Econ. 235 — Intro. to Nat. Resource Econ	3
Econ. 335 — Intermediate Natural Resource Econ.	3
Geos. 101 — General Geology	3
Geos. 101L — General Geology Lab	1
A.L.R. 101 — Conservation of Natural Resources	3
A.L.R. 201 — Processes of Natural Resources Management	3
A.L.R. 310 — Agriculture Concepts and Techniques	3
A.L.R. 340 — Natural Resources Measurements	3
A.L.R. 350 — Introduction to the Forest System	3
A.L.R. 370 — Introduction to Watershed Management	3
A.L.R. 380 — Soils	3
A.L.R. 400 — Natural Resource Policies or A.L.R. 401 — Natural Resource Legislation	3
A.L.R. 430 — Land Use Planning	3
A.L.R. 460 — Outdoor Recreation	3
W.F. 301 — Principles of Animal Population Dynamics and Management	3

3. Plus at least 12 credits from the following courses in man's environment and/or resources. Approved courses not listed here may at times be applied toward this requirement.

	Credits
Geos. 804 — Geomorphology	3
Mine 101 — Minerals and Man	3
Soc. 307 — Demography	3
Geog. 327 — Cold Lands	3
E.Q.S. 603 — Solid Waste and Air Pollution	3
A.L.R. 411 — Plant Propagation	3
A.L.R. 450 — Forest Management	3
W.F. 402 — Wildlife Biology and Management	2
Geog. 402 — Man and Nature	3
Biol. 471 — Population Ecology	3
Biol. 472 — Communities and Ecosystems	3
W.F. 430 — Fisheries and their Management	3
W.F. 417 — Forest and Tundra	2
W.F. 419 — Wetlands	2
W.F. 435 — Water Pollution Biology	2
A.L.R. 311 — Introduction to Agronomy and Horticulture	3
A.L.R. 320 — Introduction to Animal Science	3
A.L.R. 360 — Outdoor Recreation Planning	3
A.L.R. 461 — Interpretive Services	3
Econ. 437 — Regional Economic Development	3
Mine 407 — Mineral Industry and Environment	3

4. Plus a minimum of 12 credits in one of the following fields or subject areas beyond those taken to fulfill numbers 2 and 3 above. These courses are to be selected for their clear pertinence to a cohesive program in resource study and must be approved by the director.

Anthropology (cultural)
Economics
Geography
Sociology
Psychology
Business Administration
Justice
Political Science
Education
Broadcasting, Journalism
Biological Sciences
Wildlife and Fisheries
Agriculture and Land Resources
Geosciences
Mineral Engineering
Civil Engineering, Engineering Sciences and/or Environmental Quality Engineering

5. The total program must include a minimum of 12 credits in the following social sciences: anthropology, economics, sociology, political science and/or psychology.

6. Minimum credits required 130

Natural Resources Management/Forestry — B.S. Degree

1. Complete the general university requirements and B.S. degree requirements, pages 29 and 30.

2. Complete all core (major) requirements for the B.S. in natural resources management. (category 2.)

3. Complete the following courses:

	Credits
CE 112 — Elementary Surveying	3
Biol. 331 — Systematic Botany	4
A.L.R. 450 — Forest Management	3
A.L.R. 451 — Regeneration of Alaska Woody Plants	3
A.L.R. 452 — Forest Protection	3
A.L.R. 453 — Harvesting and Utilization of Forest Products	3

4. Complete nine credits from the following list of restricted electives:

Geos. 422 — Geoscience Applications of Remote Sensing	3
Geos. 408 — Map and Airphoto Analysis	2
W.F. 430 — Fisheries Management	3
W.F. 417 — Wildlife Management — Forest and Tundra	2
W.F. 401 — Wildlife Management Techniques	3
B.A. 350 — Introduction to Real Estate and Land Economics	3
A.L.R. 312 — Range Management	3
A.L.R. 300 — Internships in Natural Resources Management *(Must Be Forestry Related)*	1-6

5. Fulfill requirements of category 5 in the B.S. in natural resources management.

6. Minimum credits required 130

Natural Resources Management/Agriculture—B.S. Degree

1. Complete the general university requirements and B.S. degree requirements, pages 29 and 30.

2. Complete the following core (major) requirements for the agriculture option:

	Credits
Biol. 105-106 — Fundamentals of Biology, I and II	8
Biol. 271 — Principles of Ecology	4
Chem. 105-106 — General Chemistry	8
Econ. 235 — Intro. to Nat. Resource Econ	3
Econ. 335 — Intermediate Natural Resource Econ	3
Geos. 101 — General Geology	3
Geos. 101L — General Geology Lab	1
A.L.R. 101 — Conservation of Natural Resources	3
A.L.R. 311 — Introduction to Agronomy & Horticulture	3
A.L.R. 312 — Range Management	3
A.L.R. 313 — Introduction to Plant Pathology	4
A.L.R. 320 — Introduction to Animal Science	3
A.L.R. 321 — Applied Animal Nutrition	3
A.L.R. 340 — Natural Resources Measurements	3
A.L.R. 350 — Introduction to Forest Systems	3
A.L.R. 370 — Introduction to Watershed Science	3
A.L.R. 380 — Soils	3
A.L.R. 403 — Farm Planning and Management	3
A.L.R. 411 — Plant Propagation	3
A.L.R. 412 — Field Crop Production	3
A.L.R. 420 — Animal Nutrition and Metabolism	3
A.L.R. 450 — Forest Management	3
A.L.R. 480 — Soil Management	2

3. Complete at least 12 credits from the following list of courses:

	Credits
Biol. 210 — General Physiology	4
Biol. 239 — Plant Form and Function	4
Biol. 242 — Introductory Microbiology	3
Biol. 252 — Principles of Genetics	4
W.F. 301 — Principles of Animal Population Dynamics & Management	3

Any A.L.R. courses not used in above categories.

4. The total program must include a minimum of 12 credits in the following social sciences: anthropology, economics, sociology, political science.

5. Minimum credits required 130

Natural Resources Management — M.S. Degree

1. Complete the general university requirements and graduate degree requirements, pages 29 and 31.

2. General Requirements: All candidates will meet the general requirements for the degree; individual programs may emphasize one of the following areas; forest management, soil management, parks and recreation, agriculture, watershed management, and land use planning.

a. Candidates must have or acquire a general familiarity with the major resource fields listed above, and in addition, wildlife management, environmental quality management, and mineral industries. Program depth in any one field will depend on the needs of the candidate and the capabilities of the university. For some fields, students will take additional courses at other universities that specialize in those fields.

b. Candidates must have course work, prior to or within the program, in computer science, statistical methods, and basic economics.

3. Program requirements:

a. *Thesis degree:* Designed for those intending to pursue management careers requiring thorough familarity with research procedures and techniques in one or more of the resource fields, to proceed to doctoral programs, and/or to conduct research in management problems.

Required courses:	Credits
A.L.R. 630 — Regional Planning	3
A.L.R. 631 — Regional Planning Practicum	3
A.L.R. 692 — Graduate Seminar	4
A.L.R. 699 — Thesis	6-12
600-Level approved elective	3

Additional courses: a minimum of 5-11 credits, depending on thesis credits, individual student previous training and program needs, and approval by graduate committee.

Minimum required credits past the baccalaureate degree is 30.

b. *Non-thesis degree:* Designed for those planning for a management career involving largely non-research aspects such as general planning and administration, communication and public information, and impact assessment. The requirements are similar to the above with the following exceptions:

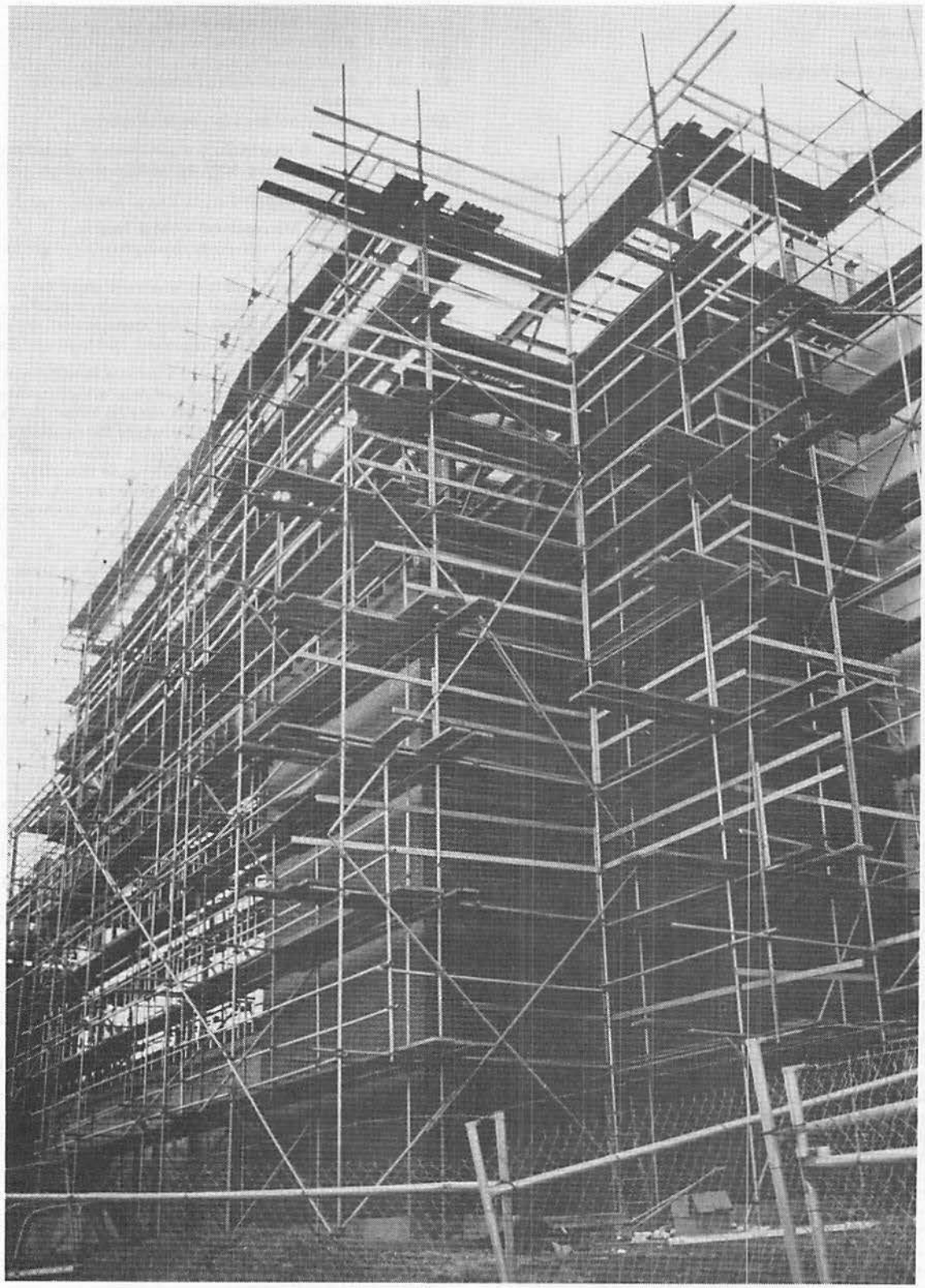
1) a 3-credit hour research paper will replace the 6-12 hour thesis;
2) additional courses; minimum credit will be increased to 19;
3) minimum number of credits required past the baccalaureate degree is 35.

4. At least 24 credits of the program, including thesis and/or research, must be at the 600 level.

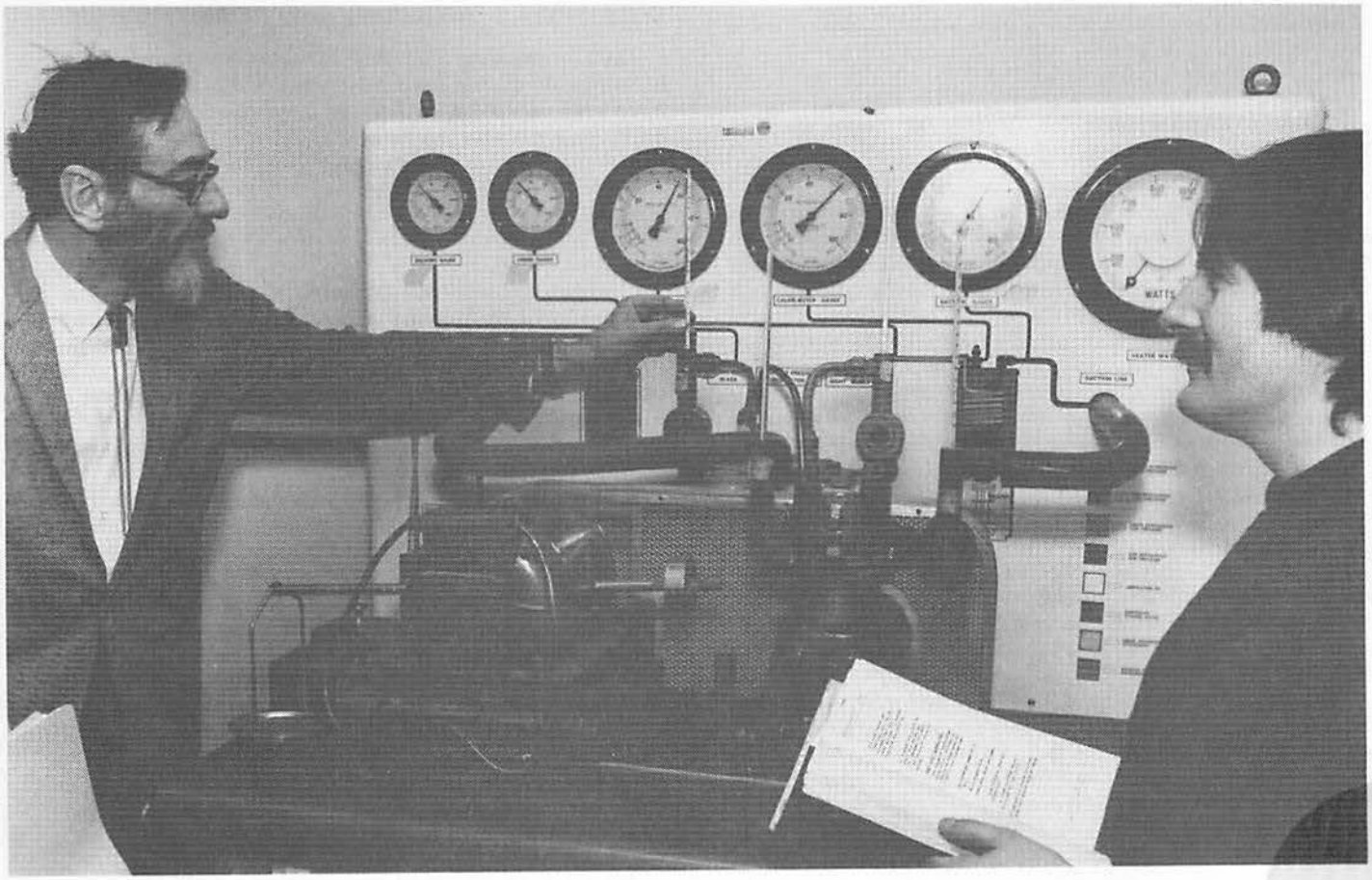
Admissions Requirements:

1. Baccalaureate degree in appropriate undergraduate major.
2. Students desiring degree programs emphasizing socio-economic aspects of natural resources management must have strong undergraduate backgrounds in the social sciences, while those wishing in-depth work in any of the specific resource fields for which the University of Alaska-Fairbanks does not have a strong undergraduate program at present, must have undergraduate degrees in such fields.
3. Scores of the general aptitude sections of the Graduate Record Examination.

Research Areas:
Thesis research will be directed toward problems specifically related to management of natural resources in high latitudes, and may involve, at various levels, basic information; biological-physical aspects of management on the land; and relationship of various management practices to the situation in Alaska at present and in the foreseeable future with respect to land ownership patterns, land use and planning, economic trends, competing resources needs and wants, and knowledge of implications of various resource uses needed for informed decision making.



School of Engineering



Professional engineering embraces the wide range of cultural and technical subjects related to the planning, design and construction of works necessary for civilization. An engineer is an innovator, a builder and a problem solver. The engineer turns scientific knowledge into goods and services useful to man and is responsible to society in the decisions he or she makes. The engineer is interested in creating, and is willing to work as a member of a professional team in a position of leadership.

In addition to providing the training necessary for entrance into the professional practice of engineering, an undergraduate degree in engineering provides an excellent background for those desiring to enter law, medical or business school. The engineering programs at the university emphasize northern problems and principles; therefore, engineering and technology graduates of UAF are in great demand not only in the Alaskan job market, but in all sections of the United States where engineering involving the additional problems of high latitude are a factor. Many of the leading professional engineers of Alaska are graduates of the UAF engineering program.

Since engineering is based on the physical sciences of mathematics, chemistry and physics, engineering students are introduced to the basic principles in these areas during their first two years of study. The third year of study is largely devoted to courses in the engineering sciences — extensions of the basic sciences forming the foundation for engineering analysis and design. In the senior year, students specialize within their disciplines and draw upon previous learning to focus their studies on creative design and analysis through simulated projects. Essential concepts and applications in engineering require analysis, synthesis and design. The reduction to proof is carried forth by the school's Engineering Experiment Station/Institute of Water Resources.

Undergraduate Degrees — The School of Engineering offers courses of study leading to the four-year bachelor of science degree in civil, electrical or mechanical engineering. The School of Engineering has all three undergraduate programs accredited by the Accreditation Board for Engineering and Technology (ABET), the agency responsible for assurance of quality in the professional schools across the nation.

Graduate Degrees — The school also offers graduate-level programs in engineering management, environmental quality engineering and arctic engineering, as well as in civil, electrical, and mechanical engineering, to students with baccalaureate degrees in engineering. Seminars and workshops are offered to

practicing engineers and others. The dean of the school is **Vincent S. Haneman, P.E.**

Arctic Engineering

Degree: M.S.
Minimum Requirements for Degree: 30 credits (beyond Bachelors Degree in Engineering)

The arctic engineering program is designed to provide training for graduate engineers who must deal with the unique challenge of design, construction, and operations in cold regions of the world. The special problems created by the climatic, geological, and logistical conditions of the Arctic and subarctic require knowledge and techniques not usually covered in the normal engineering courses. Of primary importance is a thorough understanding of heat transfer processes. In addition, properties of frozen ground and frozen water are basic to most engineering activities in the Arctic. The areas of hydraulics, hydrology and utility operations are also uniquely affected by arctic considerations. The arctic engineering program requires a set of core courses that will prepare an engineer to understand and adapt to cold regions problems and also allows the student to round out the program with elective advanced courses in his/her particular field of interest. Arctic engineering research activities carried out by faculty associated with this program can provide opportunities for theses or project papers dealing with the most current arctic knowledge.

The current development of petroleum and other natural resources has accentuated the demand for engineers trained in northern operations, both from the private industries that are involved in the development and from government agencies that must plan for or regulate this activity.

Requirements

Arctic Engineering — M.S. Degree
1. Complete the general university requirements and master's degree requirements as listed on pages 29 and 31.
2. Complete the following degree program:

A. Core Courses: (Minimum of 15 credits)	*Credits*
C.E. 681 — Frozen Ground Engineering	3
C.E. 682 — Ice Engineering or Geos. 615 — Sea Ice	3
C.E. 683 — Arctic Hydrology and Hydraulic Engineering	3
C.E. 684 — Arctic Utility Distribution	3
M.E. 685 — Arctic Heat and Mass Transfer	3
M.E. 687 — Arctic Materials Engineering	3
B. C.E. 699 — Thesis or Project	3

Electives: 12 credits in areas related to or supportive of the student's degree program and approved by the student's graduate committee.

3. Pass the state Engineer-in-Training Examination.

4. At least 24 credits, including thesis and/or research, must be at the 600 level.
Note: C.E. 603, Arctic Engineering is not an approved elective for an M.S. in Arctic Engineering.

Civil Engineering

Degrees: B.S., M.C.E., M.S.
Minimum Requirements for Degrees: B.S. — 132 credits; M.C.E. or M.S. — 30 additional credits

Civil engineering 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; and city management and developmental planning.

Candidates for the bachelor of science degree will be required to take the Alaska Engineer-in-Training Examination in their general field.

Graduate students should enter one of two programs: The master of civil engineering is for those whose goal is broad professional practice; those whose interests or background favor a specialized program, with emphasis on research and/or advanced specialized study, will ordinarily select the master of science in civil engineering degree.

In addition to the general civil engineering courses offered, the following specialty is available:

Water Resources and Hydrology: The master's degree programs can emphasize a flexible program in water resources and hydrology tailored to individual students. The courses within the department in these areas stress the problems of northern regions and emphasize principles of analysis, planning and engineering design as related to water supply, flood control, environmental safety and land management.

In addition to the civil engineering courses, a master's degree program can include courses in environmental quality engineering, engineering management and other areas. An advanced degree in environmental quality engineering is available. (See EQE program, page 117.)

Faculty

Department Head and Professor: Robert F. Carlson, P.E.
Professor: William W. Mendenhall, P.E., Timothy Tilsworth, P.E.
Associate Professors: Nicolaas Coetzee, P.E.; William E. Fuller, P.E.; Lawrence Glaum, P.E., Warren W. Hanson, P.E., Douglas L. Kane, P.E., Thomas C. Kinney, P.E.

Requirements

Civil Engineering — B.S. Degree
1. Complete general university requirements as listed on page 29.
2. Complete the following degree and program (major) requirements:

First Year

Fall Semester	*16 credits*
Engl. 111 — Methods of Written Communication	3
Math 200 — Calculus	4
E.S. 101 — Graphics	2
E.S. 111 — Engineering Science	3
Chemistry — Approved	4
Spring Semester	*17 credits*
Speech Communication Elective	3
Math 201 — Calculus	4
C.E. 112 — Elementary Surveying	3
Chemistry — Approved	4
E.S. 201 — Computer Techniques	3

Second Year

Fall Semester — *17 credits*
Math 202 — Calculus 4
Phys. 211 — General Physics 4
Engl. 211 — Intermediate Exposition, with Modes of Literature or Engl. 213 — Intermediate Exposition 3
Social Science/Humanities Elective 6

Spring Semester — *17 credits*
Math 302 — Differential Equations 3
Phys. 212 — General Physics 4
E.S. 208 — Mechanics 4
C.E. 334 — Properties of Materials 3
Social Science/Humanities Elective 3

Third Year
Fall Semester — *16 credits*
C.E. 415 — Advanced Surveying 3
E.S. 307 — Elements of Electrical Engineering 3
E.S. 331 — Mechanics of Materials 3
E.S. 341 — Fluid Mechanics 4
Social Science/Humanities Elective 3

Spring Semester — *16 credits*
E.S. 346 — Basic Thermodynamics 3
C.E. 344 — Water Resources Engineering 3
C.E. 441 — Environmental Engineering 4
Geos. 261 — Geology for Engineers 3
Technical Elective 3

Fourth Year
Fall Semester — *17 credits*
E.S. 301 — Engineering Analysis 3
C.E. 402 — Transportation Engineering 3
C.E. 435 — Soil Mechanics 3
C.E. 431 — Structural Analysis 4
Social Sciences/Humanities Elective 4

Spring Semester — *16 credits*
E.S.M. 450 — Economic Analysis and Operations 3
C.E. 422 — Foundation Engineering 3
C.E. 432 — Structural Design 4
C.E. 438 — Design of Engineered Systems 3
Technical Electives 3

Of the 16 social science/humanities credits, at least 6 must be above the 100 level or advanced courses in a 100-level sequence.

For credit toward a degree in Civil Engineering, the social science and humanities electives must be approved by the student's faculty advisor.

The ability to utilize computers for normal class work is expected in all engineering classes above the 100 level.

Civil Engineering — M.C.E. Degree

Students entering the master of civil engineering program should have completed a bachelor's degree in civil engineering. Students with bachelors degrees in other fields of engineering should check with their committee chairman for deficiency requirements.

A student will elect a civil engineering program approved by his graduate committee and must complete the general university requirements and master's degree requirements, pages 29 and 31.

Thirty credits of approved courses beyond the B.S. degree are required. M.C.E. candidates will have passed a State Engineer-In-Training Examination prior to the awarding of the degree. At least 24 credits, including thesis and research, must be at the 600 level.

Civil Engineering — M.S. Degree

A student selecting this program will meet the general university requirements and master's degree requirements, pages 23 and 25, plus the following: 30 credits approved by his graduate committee, of which six to twelve credits will be thesis. At least 24 credits, including thesis and research, must be at the 600 level. M.S. candidates will have passed a State Engineering-In-Training Examination prior to the awarding of the degree.

Electrical Engineering

Degrees: B.S., M.S., M.E.E.

Minimum Requirements for Degrees: B.S. — 133 credits; M.S. — 30 additional credits; M.E.E. — 32 additional credits

Electrical engineering encompasses the areas of computer applications and design, electrical power transmission and distribution, telecommunications and electronics. The electrical engineer designs and oversees the construction, installation and maintenance of electrical systems providing light, heat and power. Engineers design the communication systems of telephone, radio and television as well as the transistors and integrated circuits used in these systems. People trained in computer engineering automate businesses, factories, pipelines and refineries; and design control systems and computers which guide trains, planes and space vehicles. Even the test devices and tools of investigation — in medicine, in physics, in geology and in other sciences — are today largely electronic.

The scope of electrical engineering has expanded tremendously in recent years. Many developments have been important in this expansion, including automatic control theory, environmental monitoring, communications theory, new geophysical instrumentation, extra-high voltage power transmission, medical electronics, plasmas, magnetohydrodynamics, integrated circuits, satellites, and mini and microcomputers. The process controls in the extraction, transmission and refining of petroleum products are largely the responsibility of the electrical and computer engineer. Development of techniques for utilizing new energy sources presents a challenge, requiring much imagination and resourcefulness. Advanced training in engineering science and mathematics is required for creative work in these areas.

The curriculum is designed to insure that basic fundamentals are learned, as well as specialized skills. The practical needs of engineers who plan to enter practice immediately upon graduation, as well as the theoretical background needed for individuals planning to pursue graduate studies, have been taken into account in our program. Candidates for the bachelor of science degree will be required to take the State of Alaska Engineer-In-Training Examination in their general field.

Graduate students whose goal is broad professional practice will ordinarily choose the M.E.E. program; those who wish to emphasize research and advanced specialized study usually elect the M.S. degree program, which includes a thesis.

Faculty

Department Head and Professor: John D. Aspnes
Professors: John D. Aspnes, P.E.; Robert P. Merritt, P.E.; Thomas D. Roberts, P.E.
Associate Professors: Alex Hills; Kenneth J. Kokjer, P.E.
Assistant Professor: Kin-Chu Woo
Adjunct Faculty: Robert D. Hunsucker, David B. Spell, P.E.

Requirements

Electrical Engineering — B.S. Degree

1. Complete the general university requirements as listed on page 29.
2. Complete the following degree and program (major) requirements. Students must plan their elective courses in consultation with their electrical engineering faculty advisor, and all elective courses must be approved by their electrical engineering faculty advisor. At least 6 of the 16

social science and humanities elective credit must be: (a) above the 100 level; or (b) advanced courses in a 100 level sequence.

First Year

Fall Semester — *16 credits*
Engl. 111 — Methods of Written Comm. 3
Math. 200 — Calculus 4
E.S. 101 — Graphics 2
Soc. Sci. or Humanities Elective* 3
Chemistry 105 — General Chemistry 4

Spring Semester — *17 credits*
Speech Comm. Elective 3
Math. 201 — Calculus 4
E.E. 102 — Intro. to Electrical Engineering 3
Chem. 106 — General Chemistry 4
Soc. Sci. or Humanities Elective 3

Second Year

Fall Semester — *15 credits*
Math 202 — Calculus 4
Phys. 211 — General Physics 4
E.S. 201 — Computer Techniques 3
E.E. 203 — Fund. of Elec. Engineering 4

Spring Semester — *15 credits*
Math 302 — Differential Equations 3
Phys. 212 — General Physics 4
E.S. 208 — Mechanics 4
E.E. 204 — Fund. of Elec. Engineering 4

Third Year

Fall Semester — *18 credits*
E.E. 333 — Physical Electronics 4
E.E. 353 — Circuit Theory I 3
Approved Math Elective** 3
Soc. Science or Humanities elective 3
Option I: Communications
E.E. 331 — High Frequency Lab + Phys 331 (3) 1
Option II: Power and Control
E.E. 303 — Electrical Machinery 4
Option III: Computer Engineering
E.E. 442 — Digital Syst. Anal. & Design I 4

Spring Semester — *18 credits*
E.E. 334 — Electronic Circuit Design 4
E.E. 354 — Engineering Signal Analysis 3
Engl. 211 — Intermediate Exposition, with Modes of Literature or 3
Engl. 213 — Intermediate Exposition 3
E.E. 471 — Fundamentals of Automatic Control 4
Option I: Communications
E.E. 332 — Electromagnetic Waves and Devices 4
Option II: Power and Control
E.E. 404 — Electric Power Systems 4
Option III: Computer Engineering
E.E. 443 — Digital Systems Analysis and Design II 4

Fourth Year

Fall Semester — *18 credits*
Soc. Science or Humanities Elective 3
Option I: Communications
Approved Engineering Science Elective*** 3
E.E. 303 — Electrical Machinery 4
E.E. 442 — Digital Systems Analysis and Design I 4
E.E. 461 — Communications Systems 4
Option II: Power and Control
Approved Engineering Science Elective*** 3
E.E. 331 — High Frequency Lab 1
E.E. 406 — Electrical Power Engineering 4
E.E. 442 — Digital Systems Analysis and Design I 4
Phys. 331 — Electricity and Magnetism 3
Option III: Computer Engineering
E.E. 303 — Electrical Machinery 4
E.E. 331 — High Frequency Lab 1
E.E. 451 — Digital Signal Processing 3
E.E. 461 — Communications Systems 4
Phys. 331 — Electricity and Magnetism 3

Spring Semester — *17 credits*
E.S.M. 450 — Economic Analysis and Operation 3
Soc. Science or Humanities Electives 4
Approved Engineering Science Elective*** 3
Approved E.E. Elective 4
Approved E.E. Design Elective 3
Must take State of Alaska Engineer-in-Training Examination

*Social Science/Humanities elective and E.S. 201 may be interchanged if student's mathematics preparation allows.

**Mathematics elective to be chosen from the following advanced topics: linear algebra and matrices, probability and statistics, partial differential equations, numerical analysis, advanced calculus or complex variables.

***Engineering science elective to be chosen from E.S. 331, E.S. 341 and E.S. 346.

Electrical Engineering — Master's Degree
Persons interested in pursuing a master of science degree in electrical engineering or a master of electrical engineering program at UAF should consult with the head of the electrical engineering department.

Engineering and Science Management

Degrees: M.S.
Minimum Requirements for Degrees: 30 credits (beyond a bachelor's degree in engineering or a scientific field)

The engineering and science management curriculum is designed for graduate engineers and scientists who will hold executive or managerial positions in engineering, construction, industrial, or governmental organizations. It includes human relations, financial, economic, quantitative, technical and legal subjects useful in solving problems of management.

The curriculum includes graduate-level core courses in the subjects named above, plus additional course work either directed toward special problems such as arctic engineering or in one of the more general fields of engineering or science through projects or research in the application of management principles. In addition to an undergraduate degree, a candidate should have had on-the-job experience in engineering or science.

Candidates for the engineering management degree must hold a previous degree in an engineering discipline; candidates for the science management degree must hold a degree in a natural or physical science.

Faculty

Department Head and Professor: F. Lawrence Bennett, P.E.
Professors: John M. Hilpert, Charles L. Proctor, P.E.
Assistant Professor: Theodore G. Eschenbach, P.E.
Adjunct Faculty: B.G. Olson, J.D., William Satterberg, J.D.

Requirements

Engineering Management — M.S. Degree
Science Management — M.S. Degree
1. Complete the general university requirements and master's degree requirements as listed on pages 29 and 31.
2. Complete the following degree and program (major) requirements:

Fall Semester — *15 credits*
ESM 605 — Engineering Economy 3
ESM 611 — Accounting for E.S.M. 3
ESM 608 — Legal Principles for Engr. Mgt. 3
An approved course in statistics 3
*Elective 3

Spring Semester — *15 credits*

ESM 612 — Finance for E.S.M.	3
ESM 613 — Personnel for E.S.M.	3
ESM 621 — Operations Research	3
ESM 684 — Engr. Mgt. Project	3
*Elective	3

*Electives must have the approval of the department. Electives may include advanced courses in computer science but not courses in basic FORTRAN.

In addition to completing the 30 credits indicated above, a candidate must demonstrate competence in computer programming by passing a programming course or a qualifying examination.

Substitutions for one or more of the courses listed above are permitted if similar courses are included in the student's previous academic background. No more than nine credits of appropriate graduate-level course work completed at other institutions with a grade of A or B may be transferred and applied toward the total 30 credits of required and elective courses. Both substitutions and transfer of credit must be approved by the department. At least 24 credits, including thesis or research, must be at the 600 level.

Environmental Quality and Science Engineering Program

Degrees: M.S.
Minimum Requirements for Degree: 30 credits (beyond a bachelor's degree)

The environmental quality engineering curriculum is designed for graduate engineers and science majors who will pursue a career in the areas of water supply, treatment, and distribution; waste treatment, stream pollution, air pollution and solid-waste disposal. Consideration is given for broad study of the environment, prevention and abatement of quality deterioration, and solutions to environmental problems. Graduates will be prepared to hold positions in federal, state, and municipal organizations as well as in consulting engineering offices. For students having non-engineering degrees, an interdisciplinary program is available leading to the master of science in environmental quality science.

Faculty

Program Head and Professor: Robert F. Carlson, P.E.
Professor: Timothy Tilsworth, P.E.
Associate Professors: Ronald A. Johnson

Requirements

Environmental Quality Engineering — M.S. Degree
Environmental Quality Science — M.S. Degree
1. Complete the general university requirements and master's degree requirements as listed on pages 29 and 31.
2. Complete the following degree and program (major) requirements:

	Credits
EQE 601 — EQE Measurements	3
EQE 602 — Engr. Mgmt. of Water Quality	3
EQE 603 — Solid Waste and Air Pollution	3
EQE 604 — Environ. Quality Evaluation	3
EQE 605 — C/P Processes	3
EQE 606 — Biological Treatment Processes	3
*EQE 693 — Special Topics	0-3
*EQE 697 — Individual Study	0-6
*EQE 697 — Individual Study (Special Project)	3
*EQE 699 — Thesis	0-6
*Electives	6-9

*Electives, thesis, and/or special projects must have approval of graduate committee.

A minimum of 30 credits of approved and required courses must be completed. Thesis study (6 credits) is optional. At least 24 credits, including thesis and/or research, must be at the 600 level.

Thesis Option:

Thesis	6
Required courses	18
Electives	6

Non-Thesis Option:

Special Project	3
Required courses	18
Electives	9

All students will be expected to have a basic knowledge of computer programming.

Interdisciplinary Studies

Students are encouraged to develop interdisciplinary degree programs through the School of Engineering. For further information about the interdisciplinary studies program, see page 84.

Mechanical Engineering

Degrees: B.S., M.S.
Minimum Requirements for Degrees: B.S. — 130 credits; M.S. — 30 additional credits

Mechanical engineers conceive, plan, design and direct the manufacturing, distribution and operation of a wide variety of devices, machines and systems for energy conversion, environmental control, materials processing, transportation, materials handling and other purposes. Mechanical engineers are engaged in creative design, applied research, development and management. A degree in mechanical engineering also frequently forms the base for entering law, medical, or business school, as well as for graduate work in engineering.

Because engineering is based on mathematics, chemistry and physics, students are introduced to the basic principles in these areas during their first two years of study. The third year encompasses courses in the engineering science — extensions to the basic sciences forming the foundation to engineering synthesis and design. Senior year courses focus on mechanical engineering design. The design project course draws on much of the student's previous learning through a simulated industrial design project. Throughout the four-year program, courses in communication, humanities and social sciences are required because mechanical engineers must be able to communicate effectively in written, oral, and graphical form.

Students in mechanical engineering may elect to complete an emphasis in petroleum engineering consisting of 12 credit hours. Six of these credit hours can be used to fulfill the elective credit requirement in the mechanical engineering curriculum.

Because of the unique location of the University of Alaska-Fairbanks, special emphasis is placed on cold regions engineering problems. This fact is highlighted in the mechanical engineering program by the technical elective, arctic engineering.

Candidates for the bachelor of science degree in mechanical engineering will be required to take the State of Alaska Engineer-in-Training Examination in their general field.

Faculty

Department Head and Professor: John P. Zarling, P.E.
Professors: Vincent S. Haneman, Jr., P.E.; James B. Tiedemann, P.E.
Associate Professors: Ronald Johnson, P.E.; Terry McFadden, P.E.
Assistant Professors: Deben K. Das, P.E.; Jonah Y. H. Lee, Eswarahalli Venkatesh

Requirements

Mechanical Engineering — B.S. Degree

1. Complete the general university requirements as listed on page 29.
2. Complete the following degree and program (major) requirements. Students must plan their elective courses in consultation with their mechanical engineering faculty advisor, and all elective courses must be approved by their mechanical engineering faculty advisor. At least 6 of the 16 social science and humanities elective credit must be: (a) above the 100 level; or (b) advanced courses in a 100 level sequence.

First Year

Fall Semester	*16 credits*
Engl. 111 — Methods of Written Comm.	3
Math. 200 — Calculus	4
E.S. 101 — Graphics	2
E.S. 111 — Engineering Science	3
Chemistry Elective	4
Spring Semester	*17 credits*
Speech Commun. Elective	3
Math. 201 — Calculus	4
E.S. 201 — Computer Techniques	3
Humanities/Social Science Elective	3
Chemistry Elective	4

Second Year

Fall Semester	*17 credits*
Phys. 211 — General Physics	4
Math. 202 — Calculus	4
M.E. 321 — Industrial Processes	3
Eng. 211 or 213 — Intermediate Exposition	3
Humanities/Social Science Elective	3
Spring Semester	*17 credits*
Phys. 212 — General Physics	4
Math. 302 — Differential Equations	3
E.S. 208 — Mechanics	4
E.S. 346 — Basic Thermodynamics	3
Humanities/Social Science Elective	3

Third Year

Fall Semester	*16 credits*
E.S. 301 — Engineering Analysis	3
E.S. 307 — Elements of Electrical Engineering	3
E.S. 331 — Mechanics of Materials	3
E.S. 341 — Fluid Mechanics	4
E.S. 334 — Elements of Material Science/Engr.	3
Spring Semester	*16 credits*
M.E. 302 — Mechanical Design I	4
M.E. 313 — Mechanical Engineering Thermodynamics	3
M.E. 441 — Heat and Mass Transfer	3
E.S. 308 — Instrumentation and Measurement or	
E.E. 481 — Electronics and Instrumentation	3
Humanities/Social Science Elective	3

Fourth Year

Fall Semester	*16 credits*
M.E. 403 — Mechanical Design II	4
M.E. Elective**	3
M.E. 415 — Thermal Systems Laboratory	2
Technical Elective*	3
Humanities/Social Science Elective	1
Free Elective	3
Spring Semester	*15 credits*
M.E. 487 — Design Project	3
ESM 450 — Economic Analysis and Operations	3
M.E. 408 — Dynamics of Systems	3
M.E. Elective**	3
Humanities/Social Science Elective	3

*Engineering course at 400 level or above.
**Mechanical Engineering course at 400 level or above.

Selection of the elective courses must be made in consultation with M.E. advisor.

Mechanical Engineering — M.S. Degree

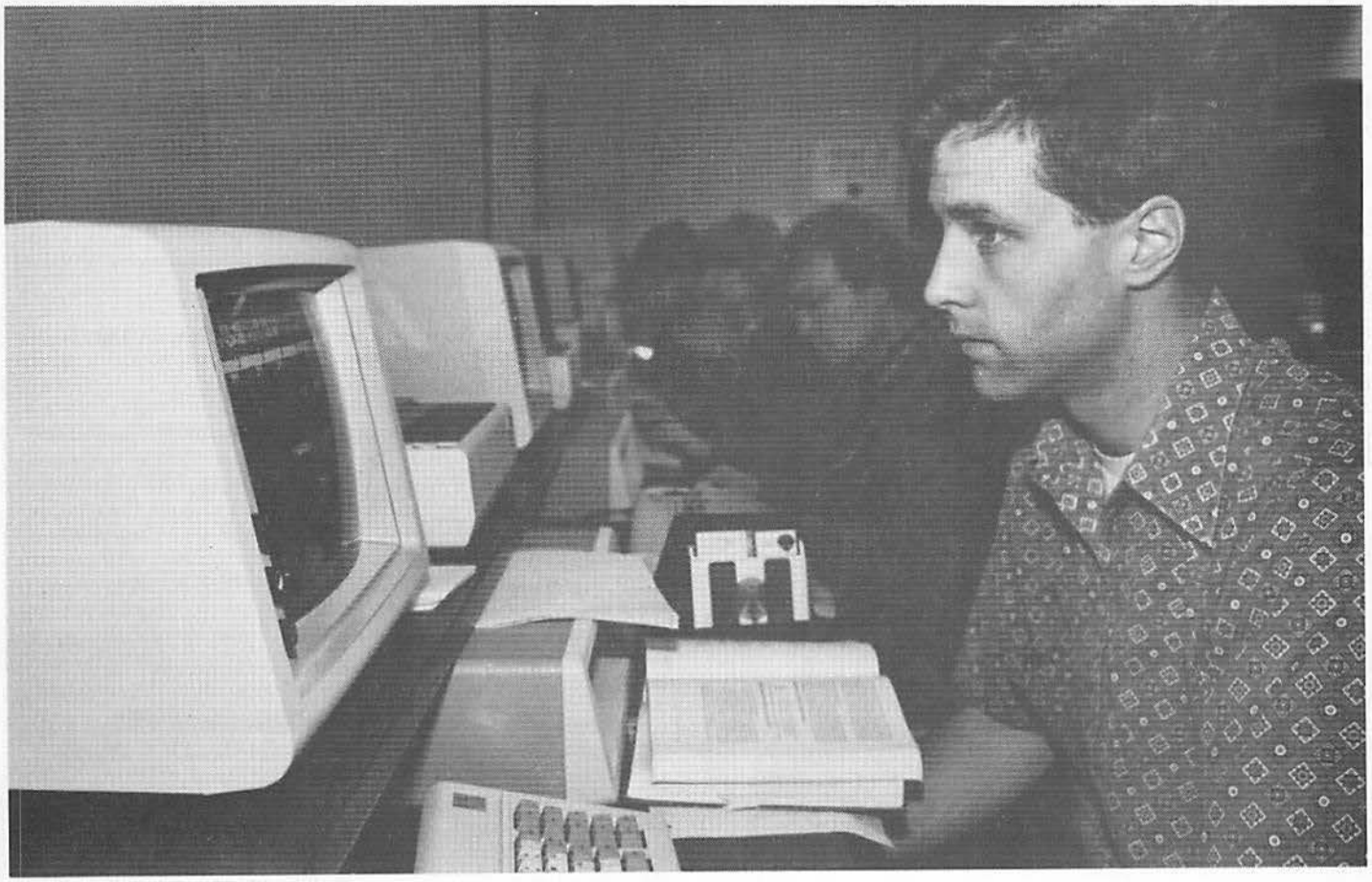
1. Complete general university requirements and master's degree requirements as listed on pages 29 and 31.

2. Complete the following program (major) requirements:

	Credits
Mathematics Core	6
Select two of the following:	
Math. 421 — Applied Analysis I (3 credits)	
Math. 422 — Applied Analysis II (3 credits)	
Math. 423 — Applied Mathematics (3 credits)	
Graduate level Numerical Analysis course in Mathematical Science (3 credits)	
Any graduate level mathematics course (3 credits)	
Mechanical Engineering Core	12
Select four of the following:	
M.E. 601 — Finite Element Analysis (3 credits)	
M.E. 604 — Experimental Mechanics (3 credits)	
M.E. 631 — Advanced Mechanics of Materials (3 credits)	
M.E. 634 — Advanced Materials Engineering (3 credits)	
M.E. 641 — Advanced Fluid Mechanics (3 credits)	
M.E. 642 — Advanced Heat Transfer (3 credits)	
Approved Electives	6
Any M.E. or other engineering/science/mathematics graduate courses approved student's graduate advisory committee.	
M.E. 699 — Thesis	6
	Total 30

Candidates for the M.S. in Mechanical Engineering must pass the Engineering-in-Training Examination.

School of Management



The School of Management offers programs of study which provide the foundation for professional careers in private or public, small or complex organizations. The undergraduate programs also provide the basis for graduate study leading to accelerated business or government careers, or for further training as a teacher or researcher in accounting, management, or economics. The graduate program is designed to provide management education for students with a wide variety of undergraduate degrees. The objectives of the school impose the obligation to prepare literate, articulate and liberally educated business specialists, knowledgeable in fundamental economic laws, accounting and information systems, and keenly sensitive to interpersonal relationships and the dignity of the individual. The school seeks to provide the technical knowledge of the accounting, economics and management professions while also emphasizing an awareness of our society and its ethical, moral and cultural values. All of these programs are designed to emphasize the problems and circumstances unique to Alaska, including treatment of start-up or venture management, international trade, regional economic development, regulation, financial institutions and markets, transportation, natural resource economics, hotel administration, and a comprehensive professional program in accounting.

Undergraduate Degrees — The school grants the following undergraduate degrees: bachelor of business administration with majors in accounting, economics, finance, management, marketing, and travel industry management; bachelor of arts degrees in economics.

Graduate Degrees — The school offers the master of business administration degree and the master of science in resource economics.

The dean of the school is **Michael L. Rice.**

Accounting

Degree: B.B.A.
Minimum Requirements for Degree: B.B.A. — 130 credits

The accounting department offers an extensive program for those interested in the fields of general accounting, auditing, managerial accounting and taxation. The objectives of the program are to provide a strong business background through an understanding of accounting and to train students for employment in accounting work.

Acceptance of upper division transfer credits toward major and foundation course requirements for the B.B.A. degree:

Courses taken at a two-year institution, or as a lower-division course in a four-year academic institution, will not be considered as replacements for upper-division course requirements for the B.B.A. degree unless the student can demonstrate a level of knowledge equivalent to material obtained in UAF courses. That level of knowledge will be determined by the department offering the course, and must be supported in writing by the department head.

Faculty

Department Head and Professor: Milton A. Fink
Professor: Burton M. Oien
Associate Professors: Thomas E. Bartlett, E. Thomas Robinson
Assistant Professor: Clifford T. Cox
Instructor: Kenneth Abramowicz

Requirements

Accounting — B.B.A. Degree

1. Complete general university requirements and B.B.A. degree requirements, pages 29 and 30.

2. Complete the following statistics requirements:

Econ. 226 — Intro. to Statistics for Economics and Business 3
Econ. 227 — Intermediate Statistics for Economics and Business 3

3. Complete the following program (major) requirements:

Common Body of Knowledge Requirements	*Credits*
Acct. 101, 102 — Elementary Accounting	6
Acct. 316 — Acct. Information Systems	3
B.A. 101 — Intro. to Management Information Systems	3
B.A. 325 — Financial Management	3
B.A. 331 — Business and Law	3
B.A. 343 — Principles of Marketing	3
Econ. 324 or 350 — Intermediate Macroeconomics/ Money & Banking	3
B.A. 360 — Operations Management	3
B.A. 390 — Organizational Behavior	3
B.A. 462 — Administrative Policy	3
Accounting — General Requirements	
Econ. 321 — Intermediate Microeconomics	3
B.A. 332 — Advanced Topics in Business and Law	3
Accounting — Major Requirements	
Acct. 310 — Income Tax	3
Acct. 342 — Managerial Cost Accounting	3
Acct. 361, 362 — Intermediate Accounting	6
Acct. 401 — Advanced Accounting	3
Acct. 404 — Advanced Managerial Cost Accounting	3
Acct. 452 — Auditing	3
Two of the following:	
Acct. 403 — Advanced Taxes	3
Acct. 405 — Contemp. Issues in Accounting	3
Acct. 472 — Computer Control and Adv. Auditing	3
Acct. 473 — Applied Systems Design	3
Free Electives *(of which a maximum of 9 credits may be taken in accounting, business administration, or economics.)*	14
3. Minimum credits required	130

Minor in Accounting:	*Credits*
Acct. 101 — Elementary Accounting	3
Acct. 102 — Elementary Accounting	3
Acct. 310 — Income Tax	3
Acct. 361 — Intermediate Accounting	3
Acct. 342 — Managerial Cost Accounting	3
Another 300- or 400-level accounting course	3

Business Administration

Degrees: B.B.A., M.B.A.
Minimum Requirements for Degrees: B.B.A. — 130 credits; M.B.A. — 30 additional credits.

The business administration department offers professional training in the field of management, finance, marketing and travel industry management 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. B.A. 151 is an overview and is recommended as an introductory course for persons with a potential interest in a business major or minor who are either undecided or perhaps unclear about the nature of the various functions performed in the administration of organizations.

Acceptance of upper division transfer credits toward major and foundation course requirements for the B.B.A. degree:

Courses taken at a two-year institution, or as a lower-division course in a four-year academic institution, will not be considered as replacements for upper-division course requirements for the B.B.A. degree unless the student can demonstrate a level of knowledge equivalent to material obtained in UAF courses. That level of knowledge will be determined by the department offering the course, and must be supported in writing by the department head.

Faculty

Professors: Peter G. Biesiot, Gerald E. Gleason, Michael L. Rice
Associate Professors: Ralph W. Nestor, Eugene Robillard, Jack Taylor, Paul C. Taylor, Howard L. Zach
Assistant Professors: Dee-fu Chen, Andrew H. Hageman, Gray Ligon
Instructor: Gerard LaParle
Lecturers: Robert M. Beconovich, Cory Borgeson, Mary McWhirter

Requirements

Business Administration — B.B.A. Degree

1. Complete general university requirements and B.B.A. degree requirements including 6 credits humanities electives (in addition to 9 credit written and oral communication requirement) as listed on pages 29 and 30.

2. Complete the following statistics requirements:

Econ. 226 — Intro. to Statistics for Economics and Business 3
Econ. 227 — Intermediate Statistics for Economics and Business 3

3. Complete the following *Common Body of Knowledge* requirements:

	Credits
Acct. 101 and 102 — Elementary Accounting	6
BA 101 — Intro. to Management Information Systems	3
BA 310 — Management Information Systems	3
BA 325 — Financial Management	3
BA 331 — Business and Law	3
BA 343 — Principles of Marketing	3
Econ. 324 or 350 — Inter. Macroeconomics/Money & Banking	3
BA 360 — Operations Management	3
BA 390 — Organizational Behavior	3
BA 462 — Administrative Policy	3

4. Complete the following *Business Administration* general requirements:

	Credits
BA 301 — Processes of Management	3
BA 332 — Advanced Topics in Business and Law	3
Acct. 352 — Management Accounting	3
Econ. 321 or 322 — Intermediate Microeconomics/Managerial Economics	3
BA 460 — International Business	3

5. Free Electives (Upper Division) 11
(Maximum of 5 credits may be taken in School of Management, or transferred courses in Accounting, B.A., or Economics.)

6. Complete one of the following majors:

Finance

The field of finance is concerned with the raising of funds and their subsequent effective use by the organizations which require them. The student is thus concerned with understanding the condition and workings of the financial system, financial policies of industrial firms and non-profit organizations, the vitality of the securities markets, and the valuation of individual securities and portfolios.

Finance Requirements:	Credits
BA 423 — Investment Management	3
BA 425 — Adv. Corp. Financial Problems	3
BA 430 — Current Topics in Finance	3
BA 461 — International Finance	3
Electives approved by major advisor	9

International Business

The interdisciplinary program in international business is designed to prepare students for careers with multinational firms, internationally oriented financial institutions, and state, national and international agencies dealing with foreign business.

International Business Requirements:	Credits
B.A. 443 — International Marketing	3
B.A. 461 — International Finance	3
Econ. 463 — International Economics	3
Two academic years of one foreign language (German, Japanese, Russian, Spanish, French)	12-18
P.S. 321 or 322 — International Politics	3
P.S. 437 — U.S. Foreign Policy	3
P.S. 481 — The UN, Model UN, and Intern'l Admin. (optional)	0-1
Complete one of the following courses (appropriate to language concentration):	
Geog. 305 — Geography of Europe (Except USSR) *or*	
Geog. 306 — Geography of the Soviet Union *or*	
Geog. 311 — Geography of Asia *or*	
Geog. 405 — Political Geography	3
Complete one additional history course appropriate to language concentration	3

(Note: Foreign language credit may also meet humanities general degree requirements. Political science credits will meet social science elective in general degree requirements. Free elective will be adjusted accordingly.)

Management

Management is that administrative force responsible for bringing together the diverse components of an organization in order to achieve effective performance. Administration includes the identification of objectives, the determination of policy, and implementation through strategic decision-making. Results are primarily achieved through the effective use of human resources and in a manner sensitive to the political, social, technological, and economic forces which constitute the environment.

Management Requirements:	Credits
BA 306 — Small Bus. Management	3
BA 361 — Personnel Management	3
Econ. 420 — Labor/Mgmt. Relations	3
BA 480 — Organization Theory	3
Electives approved by major advisor	9

Marketing

Marketing encompasses all those business activities necessary for the transfer of ownership including the logistics of physical distribution. The marketing student thus needs to study the technical activities of product and market research, advertising and promotion, transportation, the structure of markets and the cultural dimensions of consumer behavior.

Marketing Requirements:	Credits
BA 326 — Principles of Advertising	3
BA 349 — Sales Material	3
BA 436 — Consumer Behavior	3
BA 443 — International Marketing	3
BA 445 — Marketing Research	3
BA 483 — Marketing Management	3
Electives approved by major advisor	3

Travel Industry Management:

The many diverse elements of the travel/tourism industry constitute a service industry encompassing the housing, feeding, entertainment, and transportation of a growing number of visitors each year. The Travel Industry Management Program combines under one management education system the several historically separate disciplines of hotel-motel management, destination research and development, transportation, tourism management, and hospitality marketing.

Travel Industry Management Requirements:	Credits
BA 160 — Tourism Principles & Practices	3
BA 253 — Internship in Business	3
BA 372 — Hotel Administration	3
BA 375 — Marketing of Hospitality Service	3
BA 377 — Food and Beverage Mgt.	3
BA 378 — Passenger Transportation Mgt.	3
BA 465 — Tourism Destination Plan and Dev.	3
BA 471 — Tourism Seminar	3

6. Minimum credits required 130

Minor in Business Administration*:

Acct. 101 — Elementary Accounting	3
B.A. 325 — Financial Management	3
B.A. 343 — Principles of Marketing	3
B.A. 361 — Personnel Management *or* Econ. 420 — Labor/Management Relations	3
B.A. 301 — Processes of Management *or* B.A. 480 — Organization Theory	3
B.A. 101 — ~~Introduction to Data Processing and BASIC~~ Intro to Management Info Systems	3
Total	18

Minor in Travel Industry Management*:

B.A. 151 — Introduction to Business	3
B.A. 160 — Tourism Principles and Practices	3
B.A. 378 — Passenger Transportation Management	3
B.A. 465 — Tourism Destination Planning and Development	3
B.A. 471 — Tourism Seminar	3
B.A. 372 — Hotel Administration *or* B.A. 377 — Food and Beverage Management	3
Total	18

*For a Bachelor of Arts Degree.

Business Administration — M.B.A. Degree

1. Admission to the M.B.A. is open to any person possessing an undergraduate degree whose grade point average and score on the Graduate Management Admission Test indicates a potential for satisfactory completion of the program.
2. Entering students will be required to possess competence at the undergraduate level in the fields of accounting, economics, quantitative methods, management and marketing. Prior to initial enrollment, the student's record will be reviewed to determine whether deficiencies exist which must be remedied before M.B.A. core work is undertaken.
3. Complete the general university requirements and master's degree requirements as listed on pages 29 and 31.

4. Complete a minimum of 30 semester hours (including 24 hours in the required core) of courses in business administration, accounting, and economics as approved by the candidate's graduate committee. At least 24 credits, including research and/or thesis, must be at the 600 level.
5. Earn a passing score for a comprehensive written examination generally taken during the last semester of course work to test achievement and knowledge in the general area of business and specialized courses.
6. If thesis is elected, an oral examination covering its methodology and content will be conducted by the student's graduate committee.

M.B.A. Requirements:

Recognizing that competence in the practice of management necessitates training in both breadth and depth, the MBA program at the University of Alaska-Fairbanks consists of 18 courses, or the equivalent of a two-year program. The course work is divided into two tiers, or segments, as follows:

Foundation Courses

Admission to the program is open to holders of undergraduate degrees in a wide variety of disciplines. The foundation courses are offered to provide the basic environmental concepts, the required analytical tools, and the functional knowledge of business which are prerequisites to the advanced MBA core courses. Individuals with undergraduate degrees in business from accredited institutions, or with adequate preparation may waive foundation courses in those areas. Thus, it is possible that some individuals could accomplish the degree requirements with the successful completion of the 30 hours of MBA core courses.

Foundation Courses	*Credits*
Econ. 501 — Principles of Economic Analysis	3
Acct. 502 — Financial Acct. Concepts for Administrators	3
B.A. 503 — Management Practices	3
B.A. 505 — Management Information Systems	3
B.A. 506 — Quantitative Analysis	3
B.A. 525 — Financial Management	3
B.A. 543 — Marketing Management	3
B.A. 580 — Organizational Theory	3
Total Required Foundation Courses	24

Advanced MBA Core Courses

The MBA core courses constitute the second year in the program. Admission to the MBA core courses presupposes completion of the foundation core courses. At the discretion of the MBA Committee, a student who has *substantially* met the prerequisite requirements may be permitted enrollment in an MBA core course prior to completion of the foundation core program.

M.B.A. Core Courses	*Credits*
Econ. 624 — Managerial Economics	3
Acct. 650 — Management Accounting Seminar	3
B.A. 651 — Organizational Behavior	3
B.A. 680 — Seminar in Finance	3
B.A. 683 — Seminar in Marketing	3
B.A. 684 — Production and Operations Management	3
B.A. 690 — Administrative Policy	3
B.A. 691 — Research Methods and Design	3
B.A. 698 — Research Project	3
An elective chosen from B.A. 661 — Human Resource Management, Econ. 603 — Macro Economic Theory or other electives approved by the graduate committee	3
Total Required M.B.A. Core Courses	30
Total Program Requirements	54

1. Candidates with an undergraduate major or an emphasis in Economics will substitute an additional elective approved by the Graduate Committee for Managerial Economics — Econ. 624.
2. Thesis, 6 credits will substitute for B.A. 698, research project and 3 credits of electives.

Computer Information Systems

Minor Program

The computer information systems minor is designed to permit students in bachelor of arts degree programs to study a particular field of computer systems and to be introduced to a reasonable segment of information systems relating to the business enterprise.

Requirements

Requirements for the Minor in Computer Information Systems

	Credits
Acct. 101 — Elementary Accounting I	3
Acct. 102 — Elementary Accounting II	3
B.A. 101 — Introduction to Management Information Systems	3
B.A. 201 — COBOL	3
B.A. 220 — Basic Programming Languages	3
B.A. 310 — Management Information Systems	3
Acct. 316 — Accounting Information Systems	3
Total	21

Economics

Degrees: B.A., B.B.A., M.S.
Minimum Requirements for Degrees: B.A. — 120 Credits B.B.A — 130 Credits M.S. — 30 additional 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 its relations with other economic systems is therefore essential to an understanding of the world in which we live.

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

The Department of Economics offers work leading to the master of science degree in resource economics. The graduate program in economics is designed to develop economists for research and administrative positions in business, governmental agencies and other organizations. Graduate courses and seminars are offered in economic theory, econometrics, mathematical economics and resource economics.

Faculty

Department Head and Associate Professor: J. Patrick O'Brien
Professors: Richard J. Solie, Wayne C. Thomas
Associate Professors: Paul M. Comolli, William G. Workman

Assistant Professor: Abby H. Gorham, Warren L. Jones, Dennis O. Olson, Monica E. Thomas, Nancy A. Williams

Requirements

Economics — B.A. Degree

1. Complete general university requirements and B.A. degree requirements as listed on page 29.

2. Complete the following program (major) requirements:

Foundation courses (may be used to meet B.A. general degree requirements where applicable):

	Credits
Acct. 101 — Elementary Accounting	3
Econ. 201-202 — Principles of Economics I & II	6
Math. 161 — Algebra for Business and Economics	3
Math. 162 — Calculus for Business and Economics	4
P.S. 101 — American Government and Politics	3
P.S. 102, 202, 211 or 301 —	3
B.A. 101 — Intro. to Management Information Systems *or* C.S. 201 — Computer Programming I	3

Complete 30 additional credits in Economics including:	Credits
Econ. 226 — Introduction to Statistics for Economics & Business	3
Econ. 227 — Intermediate Statistics for Economics and Business	3
Econ. 321 — Intermediate Microeconomics	3
Econ. 324 — Intermediate Macroeconomics	3
*Electives in Economics	18

*Must be 300-level or higher in which 6 credits of the following courses may be included: B.A. 325, 343, 360, 423, 425, 480; and ANS 415.

3. Minimum credits required 120

Economics — B.B.A. Degree

Acceptance of upper division transfer credits toward major and foundation course requirements for the B.B.A. degree.

Courses taken at a two-year institution, or as a lower-division course in a four-year academic institution, will not be considered as replacements for upper-division course requirements for the B.B.A degree unless the student can demonstrate a level of knowledge equivalent to material obtained in UAF courses. That level of knowledge will be determined by the department offering the course, and must be supported in writing by the department head.

1. Complete general university requirements and B.B.A degree requirements as listed on pages 29 and 30. The 6 credit humanities electives shall include a combination of courses (classified as humanities) in which 3 credits shall be selected from either philosophy, English (other than composition) or foreign language at the 200 level or above.

2. Complete the following statistics requirements:

Econ. 226 — Intro. to Statistics for Economics and Business 3
Econ. 227 — Intermed. Statistics for Economics and Business 3

3. Complete the following program (major) requirements:

Common Body of Knowledge (CBK) Requirements	33 Credits
Acct. 101 and 102 — Elementary Accounting	6
Acct. 316 — Accounting Information Systems	3
(For those students pursuing a double major in accounting and economics.) or BA 310	3
B.A. 101 — Intro. to Management Information Systems	3
~~B.A. 310 — Intermed. Management Information Systems~~	~~3~~
B.A. 325 — Financial Management	3
B.A. 331 — Business and Law	3
B.A. 343 — Principles of Marketing	3
Econ. 324 or 350 — Intermediate Macroeconomics or Money and Banking	3
B.A. 360 — Operations Management	3
B.A. 390 — Organizational Behavior	3
B.A. 462 — Administrative Policy	3

Economics Major Requirements	27 Credits
A. General Requirements	
P.S. 201, 211, 263, or 302	3
B. Economics Requirements	
Econ. 321 — Intermediate Microeconomics	3
Econ. 324 — Intermediate Macroeconomics (if not taken in CBK)	0-3
Econ. 463 — International Economics	3
Nine hours from the following courses (At least three hours must be at the 400 level): Econ. 335, 350, 351, 409, 420, 421, 436, 437, 438, 451, and ANS 415	6-9*
Electives approved by major advisor	9**
C. Free Electives	
These credits may be used for an optional minor or second BBA Major. (At least 3 credits must be in courses offered outside of School of Management.)	20 Credits

3. Minimum credits required 130

*Only six credit hours of electives in this category are required if Econ 350 is taken as part of the CBK.

**Courses in this category must at the upper division level and may be accounting, business, or economics courses, where three (3) credits must be taken in either accounting or business administration. Courses in this category may be utilized to satisfy the requirements of other BBA degree majors.

Minor in Economics:

All minor programs must be approved by the head of the Economics Department.

A minor in Economics requires:	Credits
Econ. 201 — Principles of Economics I	3
Econ. 202 — Principles of Economics II	3
9 credits in approved economics courses at the 300-level or above	9
Total	15

Resource Economics — M.S. Degree

1. Admission Requirements

a. Baccalaureate degree in appropriate undergraduate major.

b. Unconditional acceptance requires completion of intermediate microeconomics and macroeconomics, basic statistics, and one semester of calculus. Students may be accepted into the program subject to identified deficiencies being rectified.

c. Scores of the general aptitude sections of the Graduate Record Examination.

2. Complete the general university requirements and master's degree requirements as listed on pages 29 and 31.

3. Complete a minimum of 31 credits of course work, including Econ 699 — Thesis, in the field of resource economics. At least 25 credits, including thesis, must be at 600 level.

4. Program Requirements:

Required Courses:	Credits
Econ. 601 — Microeconomic Theory I	3
Econ. 603 — Macroeconomic Theory I	3
Econ. 623 — Mathematical Economics	3
Econ. 626 — Econometrics	3
Econ. 635 — Resource Economics I	3
Econ. 636 — Resource Economics II	3
Econ. 670 — Seminar in Research Methodology	1

Elective Courses:

A minimum of 6 credits and approval by graduate committee.

Thesis: A minimum of 6 credits.

Emphasis in Mineral Economics

1. In addition to the requirements stated above, students pursuing an emphasis in Mineral Economics are expected to have completed the following coursework: introduction to mineral industry, mineral valuation, operations research, mining law, mining geology and at least one credit in financial management.

2. Complete the general university requirements and master's degree requirements as listed on pages 29 and 31.

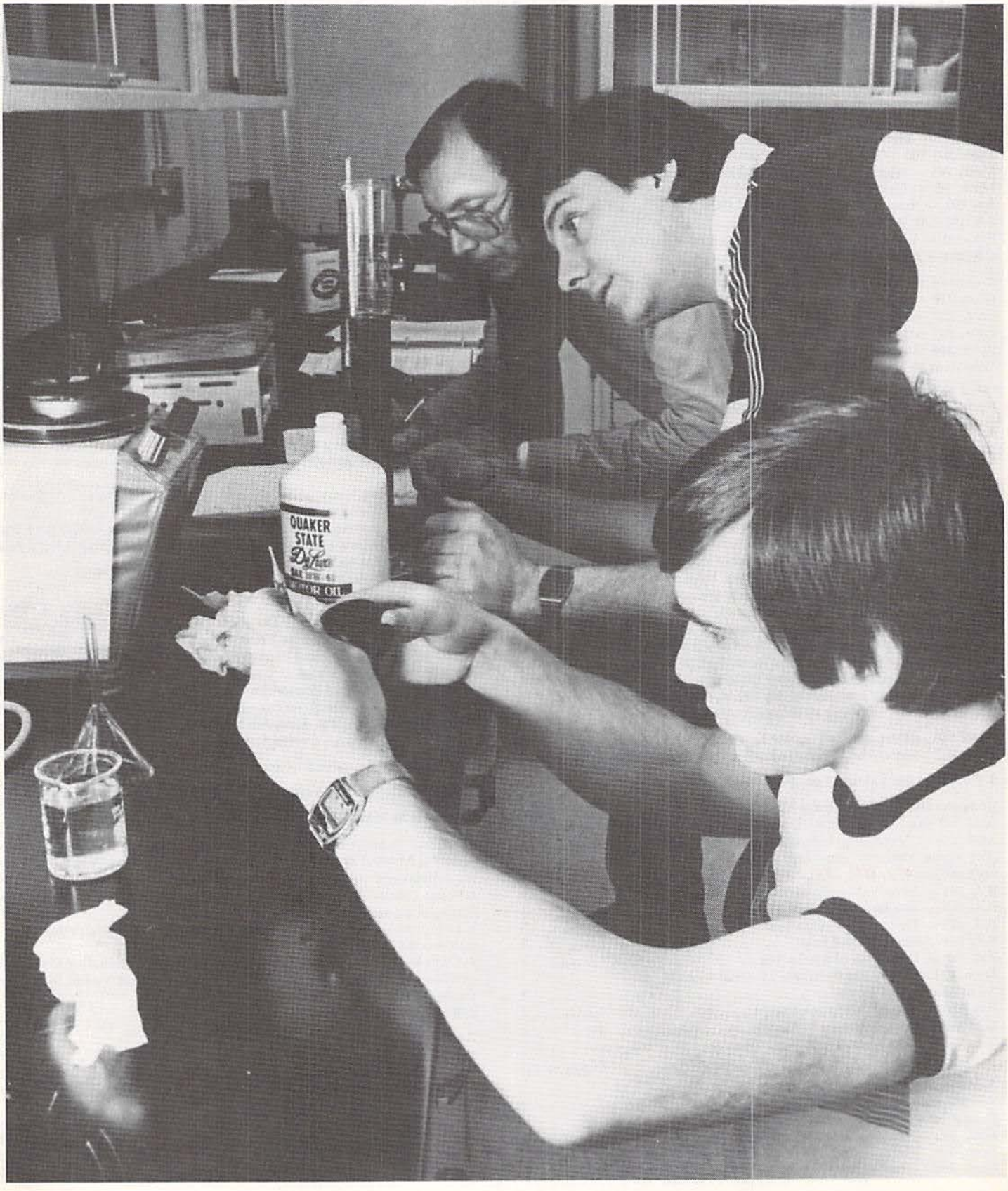
3. Complete a minimum of 34 credits of coursework, including Econ. 699 — Thesis, in the field of mineral economics. At least 28 credits, including thesis, must be at the 600-level.

4. Emphasis Requirements:

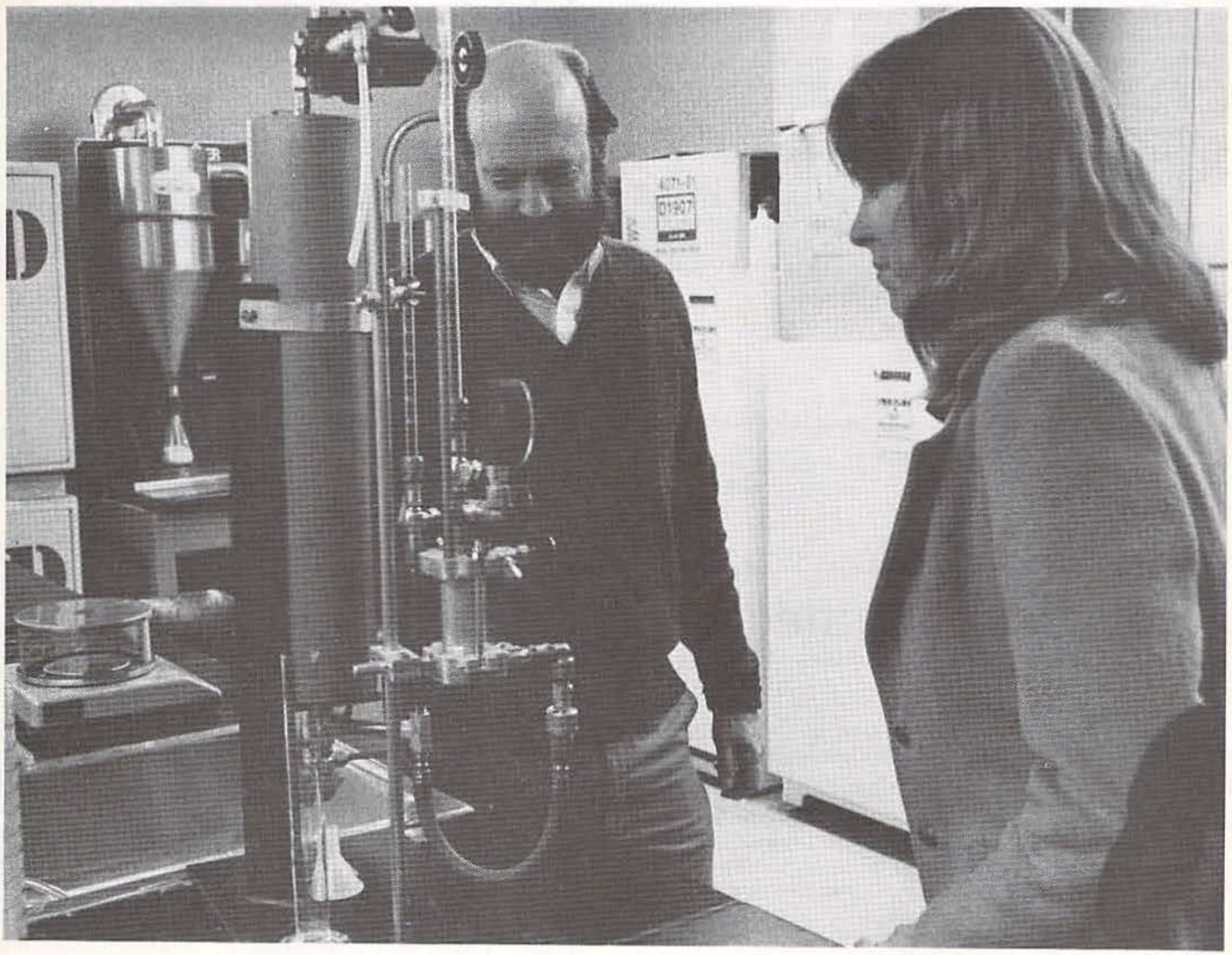
Required Courses:	Credits
Econ. 601 — Microeconomic Theory	3
Econ. 603 — Macroeconomics Theory	3
Econ. 623* — Mathematical Economics	3
Econ. 626 — Econometrics *or* Min. 635 — Geostatistical Ore Reserve Estimation	3
Econ. 635 — Resource Economics I	3
Econ. 636 — Resource Economics II	3
Econ. 670 — Seminar in Research Methodology	1

Min. 621 — Advanced Mineral Economics 3
B.A. 680 — Seminar in Finance 3
Econ. 699 — Thesis 6
Approved Elective 3

*Students who have successfully completed differential equations may substitute an approved elective for Econ. 623.



School of Mineral Engineering



Mankind's emergence and progress is marked by passage from one metal age to another. The keystone to our present economy is measured in minerals and energy and it would be difficult to conceive of a modern life without them. Within the career fields of minerals and energy, the opportunities are limited only by a person's ability to apply engineering principles in new and imaginative ways.

The School of Mineral Engineering is composed of the Department of Mining and Geological Engineering, the Department of Petroleum Engineering, the Mineral Industry Research Laboratory, the Petroleum Development Laboratory and the Mining Extension Programs.

Emphasis is placed upon engineering as it applies to the exploration, development and exploitation of mineral and energy resources in the education and training of the undergraduate and graduate students who will be tomorrow's leaders in these industries.

Undergraduate Degrees - The School of Mineral Engineering offers programs of study leading to the bachelor of science degree in geological, mining and petroleum engineering. The geological and mining programs are accredited by the Accreditation Board for Engineering and Technology (ABET) which is the organization responsible for guaranteeing standards and quality in nation wide engineering schools.

Graduate Degrees - Graduate-level programs are also offered in geological engineering, mining engineering, mineral preparation engineering and petroleum engineering in conjunction with the research activities of the Mineral Industry Research Laboratory (MIRL) and the Petroleum Development Laboratory (PDL).

The acting dean of the school is **Donald J. Cook.**

Mining and Geological Engineering

The department has statewide responsibility for academic instruction in the fields of geological engineering and mining engineering. Overall, the objectives of the department are to prepare students for their places as contributive citizens and for professional careers in the mineral industry.

Undergraduate Degrees — The department has programs that lead to bachelor of science degrees in geological engineering and mining engineering.

Graduate Degrees — Programs leading to a master of science degree are offered in mining engineering, mineral preparation and geological engineering.

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

Faculty

Department Head and Professor: Frank Skudrzyk
Professors: N. B. Aughenbaugh, P.E.; B. M. Hamil; D. R. Maneval; P. D. Rao
Associate Professors: R. C. Speck; N. I. Johansen, P.E.; M. Sengupta
Assistant Professors: S. Bandopadhyay; S. L. Huang; P. Metz
Instructor: D. Walsh

Geological Engineering

Degrees: B.S., M.S.

Minimum Requirements for Degree: B. S. — 130 credits plus 6 credits field course; M.S. — 30 additional credits.

Geological engineering is a branch of engineering dealing with the application of geology. Geological engineers work with man's environment in the true sense of the word. Properties of earth materials exploration activities, geophysical and geochemical prospecting, site investigations and engineering geology are all phases of geological engineering.

Candidates for the bachelor of science degree in geological engineering will be required to take a comprehensive exam in their general field (completion of the State of Alaska Engineering-in-Training examination will satisfy the requirement). The State of Alaska Engineer-in-Training examination is a first step toward registration as professional engineers.

Graduates of the program are employed by industry, consulting companies, and government agencies.

Students may initiate their geological engineering program in Anchorage and transfer to Fairbanks upon completion of the freshman and sophomore years. Such students should be in communication with a faculty member of the Department of Mining and Geological Engineering, UAF.

Undergraduate Degrees: The Department of Mining and Geological Engineering offers the bachelor of science degree in geological engineering and the bachelor of science in mining engineering (see separate description of this degree under mining engineering).

Graduate Degrees: The graduate program allows for awarding the master of science degree in geological engineering. The degree consists of a core program and electives in either geotechnical engineering or exploration engineering. University policy pertaining to graduate study leading to a master's degree apply as approved by the student's adviser and the Department of Mining and Geological Engineering faculty.

Requirements

Geological Engineering — B.S. Degree

1. Complete the general university requirements as listed on page 29.
2. Complete the following degree and program (major) requirements:

First Year

Fall Semester	*17 Credits*
G.E. 101 — Introduction to Geological Engineering	1
Engl. 111 — Methods of Written Communications	3
Math. 200 — Calculus	4
Chem. 105 — General Chemistry	4
E.S. 101 — Graphics	2
Social Science or Humanities**	3

Spring Semester	*17 Credits*
Sp.C. Elective	3
Math. 201 — Calculus	4
GE/Geos. 261 — General Geology for Engineers	3
Chem. 106 — General Chemistry	4
Social Science or Humanities Elective	3

Second Year

Fall Semester	*18 Credits*
Math. 202 — Calculus	4
Geos. 213 — Mineralogy	4
Phys. 211 — General Physics	4
Engl. 211 or 213 — Intermediate Exposition	3
Min. 202 — Mine Surveying	3

Spring Semester	*17 Credits*
E.S. 201 — Computer Techniques	3
Phys. 212 — General Physics	4
E.S. 208 — Mechanics	4
Geos. 214 — Petrology	3
Social Science or Humanities Electives**	3

Third Year

Fall Semester	*16 Credits*
E.S. 331 — Mechanics of Materials	3
E.S. 341 — Fluid Mechanics	4
G.E. 365 — Geological Engineering I	3
Math. 302 — Differential Equations	3
Geos. 321 — Sedimentology	3

Spring Semester	*15 Credits*
Geos. 314 — Structural Geology	3
G.E. 372 — Rock Engineering	3
Min. 370 — Rock Mechanics* or Technical Elective	3
A.S. 301 — Elementary Probability & Statistics	3
Technical Elective	3

Summer	*Credits*
Geos. 351 — Field Geology	6

Fourth Year

Fall Semester	*15 Credits*
C.E. 435 — Soil Mechanics* or Technical Elective	3
G.E. 375 — Terrain Analysis	3
Social Sciences or Humanities Elective**	7
Technical Elective***	2

Spring Semester	*15 Credits*
G.E. 405 — Exploration Geophysics	4
G.E. 471 — Remote Sensing for Engineering	3
G.E. 420 — Subsurface Hydrology	3
Min. 408 — Mineral Valuation and Economics	3
G.E. 480 — Geological Engineering II	2
Total credits required	136

* Either Min. 370 or C.E. 435 is required. Selection is dependent upon the student's interest and professional orientation.

** Of the 16 social science/humanities credits, at least 6 must be at/or above the 200 level or advanced courses in a 100 level sequence.

***Technical electives are dependent upon professional interest and selected by the student in conference with his or her advisor and approved by the Department.

Geological Engineering — M.S. Degree

1. Complete the general university requirements and graduate degree requirements on pages 29 and 31.

Fall Semester	*15 Credits*
Min. 621 — Advanced Mineral Economics	3
Min. 631 — Research Methods	3
G.E. 666 — Advanced Engineering Geology or G.E. 675 — Applied Mining Geology	3
Approved Technical Electives	3
G.E. 471 — Remote Sensing for Engineers	3
Spring Semester	*15 Credits*
Approved Technical Electives (minimum)	3
Thesis (maximum)	12

Electives will consist of an approved course of study which will prepare the student for either exploration engineering or geotechnical engineering.

All graduate students will be expected to acquire some teaching and/or research experience in addition to thesis work as part of their M.S. degree program.
At least 24 credits, including thesis and/or research, must be at the 600 level.

Interdisciplinary Studies

Students are encouraged to develop interdisciplinary degree programs through the School of Mineral Engineering. For further information about the Interdisciplinary Studies program, see page 84.

Mining Engineering

Degrees: B.S., M.S.
Minimum Requirements for Degrees: B.S. — 130 credits; M.S. — 30 additional credits; E.M. — thesis and 5 years of experience

In the mining engineering curriculum, particular emphasis is placed upon engineering as it applies to the exploration and development of mineral resources and upon the economics of the business of mining. The program allows the student the choice of technical electives to develop in areas of exploration, mining or mineral beneficiation.

Candidates for the bachelor of science degree in mining engineering will be required to take a comprehensive examination in their general field (completion of the State of Alaska Engineer-in-Training examination will satisfy this requirement). The state of Alaska Engineering-in-Training is a first step toward registration as professional engineers.

Students may initiate their mining engineering program in Anchorage and transfer to Fairbanks upon completion of their freshman or sophomore year. Such students should be in communication with faculty of the mining and geological engineering department, UAF.

Undergraduate Degrees — The Department of Mining and Geological Engineering offers the bachelor of science degree in geological engineering and the B.S. in geological engineering (see separate description of this degree under geological engineering).

Graduate Degrees — The graduate program allows for the awarding of master of science degree in mining engineering. The curricula consist of required and elective course work as outlined below. University policy pertaining to graduate study leading to a master's degree apply as approved by the student's adviser and the Mining and Geological Engineering faculty.

***Professional Degrees** — The graduate program also provides for the awarding of a professional degree, Engineer of Mines (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

Mining Engineering — B.S. Degree
1. Complete the general university requirements as listed on page 29.
2. Complete the following degree and program (major) requirements.

First Year

Fall Semester	*17 Credits*
Engl. 111 — Methods of Written Communications	3
Math. 200 — Calculus	4
Chem. 105 — General Chemistry	4
Min. 103 — Introduction to Mining Safety and Engr.	3
Social Sciences or Humanities Elective[1,2]	3
Spring Semester	*16 Credits*
Chem. 106 — General Chemistry	4
Sp.C. Elective	3
Math. 201 — Calculus	4
E.S. 101 — Graphics	2
Geos. 261 — General Geology for Engineers	3

Second Year

Fall Semester	*17 Credits*
Math. 202 — Calculus	4
G.E./Geos. 262 — Mineralogy and Petrology for Engr.	3
Phys. 211 — General Physics	4
Min. 202 — Mine Surveying	3
M.Pr. 313 — Introduction to Mineral Preparation	3
Spring Semester	*17 Credits*
Phys. 212 — General Physics	4
E.S. 208 — Mechanics	4
E.S. 201 — Computer Techniques	3
Engl. 211 or 213 — Intermediate Exposition	3
Math. 302 — Differential Equations	3

Third Year

Fall Semester	*17 Credits*
E.S. 331 — Mechanics of Materials	3
E.S. 341 — Fluid Mechanics	4
A.S. 451 — Statistics for Civil Engineering	3
E.S. 307 — Elements of Electrical Engineering	3
Geos. 407 — Geology of Mineral Resources	4
Spring Semester	*16 Credits*
E.S. 346 — Basic Thermodynamics	3
Min. 370 — Rock Mechanics	3
Min. 301 — Mine Plant Design	3
Min. 302 — Underground Mine Environmental Engineering	3
Social Sciences or Humanities[1,2]	4

Fourth Year

Fall Semester	*18 Credits*
Min. 443 — Rock Fragmentation	3
Min. 445 — Design of Surface Mines for Conv. & Arctic Cond.	3
Min. 446 — Underground Mining Meth. & Their Design	3
Min. 447 — Mining Methods for Placer and Offshore Deposits	3
Social Sciences or Humanities[1,2]	6

Spring Semester	*17 Credits*
Min. 408 — Mineral Valuation and Economics	3
Min. 409 — Operations Research & Computer Appl. in Min. Ind.	3
Min. 490 — Mine Design Project	2
Technical Electives[2]	6
Social Sciences *or* Humanities[1,2]	3

Notes:

[1] Of the 16 social science/humanities credits, at least 6 must be at or above the 200 level or advanced courses in a 100 level sequence.

[2] Students must plan their elective courses in consultation with their mining engineering faculty advisor. Technical electives are selected from the list of the approved technical electives for mining engineering program and other programs course listing. All elective courses must be approved by the department head.

Recommended Technical Electives for B.S. in Mining Engineering

1. Min. 472 — Design, Construction and Stability of Mining Openings.
2. G.E. 405 — Exploration Geophysics
3. G.E. 440 — Slope Stability
4. M.Pr. 410 — Materials Handling Systems for Mineral Preparation

At least three out of the 6 technical elective credits must be taken from the above list of the approved technical electives. The other three credits should be chosen in consultation with the advisor and subject to approval by the department head.

Mining Engineering — M.S. Degree

1. Complete the general university requirements and graduate degree requirements, pages 29 and 31.
2. Complete the following program (major) requirements:

Fall Semester	*15 Credits*
Min. 631 — Research Methods in Mineral Engineering	4
Min. 637 — Mine Systems Simulation *or*	
Min. 673 — Theoret. and Exper. Methods in Rock Mechanics	3
Min. 621 — Advanced Mineral Economics	3
Approved Technical Electives	3-6
Min. 688 — Graduate Seminar I	1

Spring Semester	*15 Credits*
Min. 433 — Mining Access, Safety and Environmental Law	3
Min. 689 — Graduate Seminar II	1
Min. 699 — Thesis*	6
Approved Technical Electives	3-6

*6 credit maximum. At least 24 credits, including thesis, must be at the 600 level.

3. All graduate students will be expected to acquire some teaching and/or research experience in addition to thesis work as part of their M.S. degree requirements.
4. Technical electives will consist of 9 course credits approved by the advisory committee to prepare the student for his/her thesis work. At least two of the technical electives must be taken from the following list:

C.E. 603 — Arctic Engineering	3
Pet.E. 666 — Arctic Drilling and Well Completion	3
Min. 635 — Geostatistical Ore Reserve Estimation	3
Min. 646 — Mining Engineering in the Arctic	3
Min. 647 — Advanced Underground Mine Design	3
Min. 673 — Theoret. and Exper. Methods in Rock Mechanics *or*	
Min. 637 — Mine Systems Simulation	3
Min. 652 — Numerical Methods in Mine Ventilation	3
Min. 674 — Selected Topics in Rock Mechanics	3

Engineer of Mines — E.M. Degree

1. Requirements to be fulfilled:
a. The applicant must be a graduate from the School of Mineral Engineering, University of Alaska-Fairbanks, with an engineering degree.
b. A minimum of five years of responsible engineering work is required.
c. An acceptable thesis* must be submitted.
2. The applicant must complete and submit a University of Alaska-Fairbanks graduate application for admission form to the Director of Admissions and Records for the engineer of mines degree program. Included with the application must be a resume of engineering work experience as mentioned in 1(b).
3. The application will be reviewed by the dean of the School of Mineral Engineering for acceptance recommendation and concurrence with the thesis topic selected.
4. The thesis will be prepared to meet the format requirements as outlined in the *Manual of Procedures and Information for Graduate Students*, including filing a copy in the university library.
5. Submission of thesis should follow the same procedures and leadtimes as outlined on page 35, as should the submission of the application for graduation form.
6. The dean of the School of Mineral Engineering will convene a committee of four faculty members, one from outside the school, to review the thesis, give guidance as needed and to assure that the thesis is satisfactory to meet the degree requirements and finally approve the thesis. A defense of thesis, oral or written, will be made to the committee.

Class work beyond the initial degree is not required, and credits for the thesis will be a minimum of six.

Registration at UAF during the semester of the thesis submittal is required.

*An "acceptable thesis" is defined as a demonstration of professional competence combined with normal research methods working with the student's committee.

Mineral Preparation Engineering

Degree: M.S.
Minimum Requirements for Degree: 30 credits beyond Bachelor's degree.

Requirements

Mineral Preparation Engineering — M.S. Degree

1. Complete the general university requirements and master's degree requirements as listed on pages 29 and 31.
2. Complete the following degree and program requirements:

Fall Semester	*15 Credits*
M.Pr. 601 — Froth Flotation	3
M.Pr. 433 — Coal Preparation	3
Min. 621 — Advanced Mineral Economics	3
G.E. 431 — Applied Ore Microscopy	2
M.Pr. 699 — Thesis	4

Spring Semester	*15 Credits*
M.Pr. 684 — Mineral Preparation Research	3
M.Pr. 606 — Plant Design	3
M.Pr. 699 — Thesis	3
*Electives	6

*Electives will be in the field of chemistry, physics, and mathematics and will be chosen to broaden the candidate's fundamental knowledge, depending upon his/her specific background and interest. Electives must be at 600 level.

Petroleum Engineering

Degrees: B.S., M.S.
Minimum Requirements for Degrees: B.S. — 130 credits; M.S. — 30 additional credits.

Petroleum engineering at the University of Alaska-Fairbanks offers a unique look at the challenging problems confronting the petroleum industry. Both the bachelor of science and the master of science degrees are available. Requirements for the degrees focus on many disciplines, including mathematics, physics,

chemistry, geology and engineering science. In addition, courses in petroleum engineering deal with drilling, formation evaluation, production, reservoir engineering, computer simulation and enhanced oil recovery.

The curriculum at UAF was designed to prepare graduates to meet the demands of modern technology while emphasizing, whenever possible, the special problems encountered in Alaska. Located in one of the largest oil producing states in the nation, the Department of Petroleum Engineering offers one of the most modern and challenging degree programs available.

The M.S. program is intended to provide the student with an advanced treatment of petroleum engineering concepts. Students with B.S. degrees in petroleum, chemical or mechanical engineering may be accepted to the programs as full fledged candidates while those with degrees in peripheral fields may be accepted without class standing and advanced without class standing and advanced to candidacy following the completion of certain prerequisite courses. A number of generous research and teaching assistantships are available for the qualified candidate.

Faculty

Department Head and Assistant Professor: Russell D. Ostermann
Professor: G.D. Sharma
Assistant Professors: K. Dehghani, S. Godbole, D. Ogbe, E. Venkatesh

Requirements

Petroleum Engineering — B.S. Degree

1. Complete the general university requirements as listed on page 29.
2. Complete the following degree and program (major) requirements:

First Year

Fall Semester	*16 Credits*
Pet.E. 103 — Survey of the Energy Industry	2
Math. 200 — Calculus I	4
Chem 105 — General Chemistry	4
Engl. 111 — Methods of Written Communication	3
Humanities or Social Science Elective[1]	3

Spring Semester	*17 Credits*
E.S. 201 — Computer Techniques	3
Math. 201 — Calculus II	4
G.E./Geos. 261 — Geology for Engineers[2]	3
Chem 106 — General Chemistry II	4
*Speech Communication Elective	3

Second Year

Fall Semester	*17 Credits*
Pet.E. 205 — Introduction to Petroleum Drilling and Production	3
Math. 202 — Calculus III	4
Phys. 211 — General Physics I	4
Engl. 211/213 — Intermediate Exposition[3]	3
Humanities or Social Science Elective[1]	3

Spring Semester	*17 Credits*
E.S. 208 — Mechanics	4
Math. 302 — Differential Equations	3
Phys. 212 — General Physics II	4
E.S. 346 — Basic Thermodynamics	3
Humanities or Social Science Elective[1]	3

Third Year

Fall Semester	*16 Credits*
Pet.E. 301 — Reservoir Rock Properties	3
Math. 310 — Numerical Analysis	3
E.S. 331 — Mechanics of Materials	3
E.S. 341 — Fluid Mechanics	4
Humanities or Social Science Elective[1]	3

Spring Semester	*18 Credits*
Pet.E. 302 — Well Logging	3
Pet.E. 305 — Underground Fluid Behavior and Lab	4
Pet.E. 426 — Drilling Engr. & Lab	4
M.E. 441 Heat and Mass Transfer	3
Geos. 370 — Struct. Geol. for Petr. Engr	4

Fourth Year

Fall Semester	*18 Credits*
Pet.E. 407 — Production Engr. & Lab	4
Pet.E. 421 — Subsurface Engineering	3
Pet.E. 431 — Natural Gas Engineering	2
Pet.E. 476 — Reservoir Engineering	3
*Engineering Elective (e.g. ME 416 or E.S. 307)	3
*Technical Elective (e.g. C.E. 603 Arctic Engr.)	3

Spring Semester	*14 Credits*
Pet.E. 456 — Pet. Eval. and Econ. Dec	3
Pet.E. 466 — Petroleum Recovery Meth	3
Pet.E. 478 — Well Test Analysis	2
Pet.E. 489 — Reservoir Simulation	2
Humanities or Social Science Elect[1]	4

Notes:

[1] Sixteen credits in humanities and social sciences are required. All electives must be approved by the petroleum engineering faculty advisor. At least 6 of the 16 credits must be (a.) above the 100-level or (b) advanced courses in a 100-level sequence: and at least 3 credits must be in the humanities and 3 in the social science designation.

[2] Geos. 101 may be taken in a fall semester in place of G.E. 261.

* As approved by advisor.

[3] Engl. 312 — Technical Writing, may substitute for Engl. 211 or 213.

[4] As approved by the Board of Architects, Engineers and Land Surveyors, students are required to take the EIT exam as a condition of graduation.

Petroleum Engineering — M.S. Degree

1. General Requirements: (a) The student must complete the general university requirements and master's degree requirements; (b) the student must complete at least 24 semester units of course work and a minimum of 6 units of thesis detailing the research done on a project approved by the student's committee; (c) the student must earn a satisfactory score on a written comprehensive exam prior to submission of the thesis, and must subsequently present an oral defense of the thesis.
2. Course Requirements: Core courses for a total of 12 semester hours will be required of all students for the master of science degree in petroleum engineering. These courses are listed below:

A.	*Credits*
C.E. 603 — Arctic Engineering	3
Pet.E. 610 — Advanced Reservoir Engineering	3
Pet.E. 620 — Introductory Graduate Seminar	1
Acct. 623 — Property Valuation and Petroleum Accounting	3
Pet.E. 650 — Advanced Topics in Petroleum Engineering	2

B. In addition, 3 hours of advanced level mathematics and 3 hours of geology electives must be completed. Course selection will be subject to the approval of the student's committee.

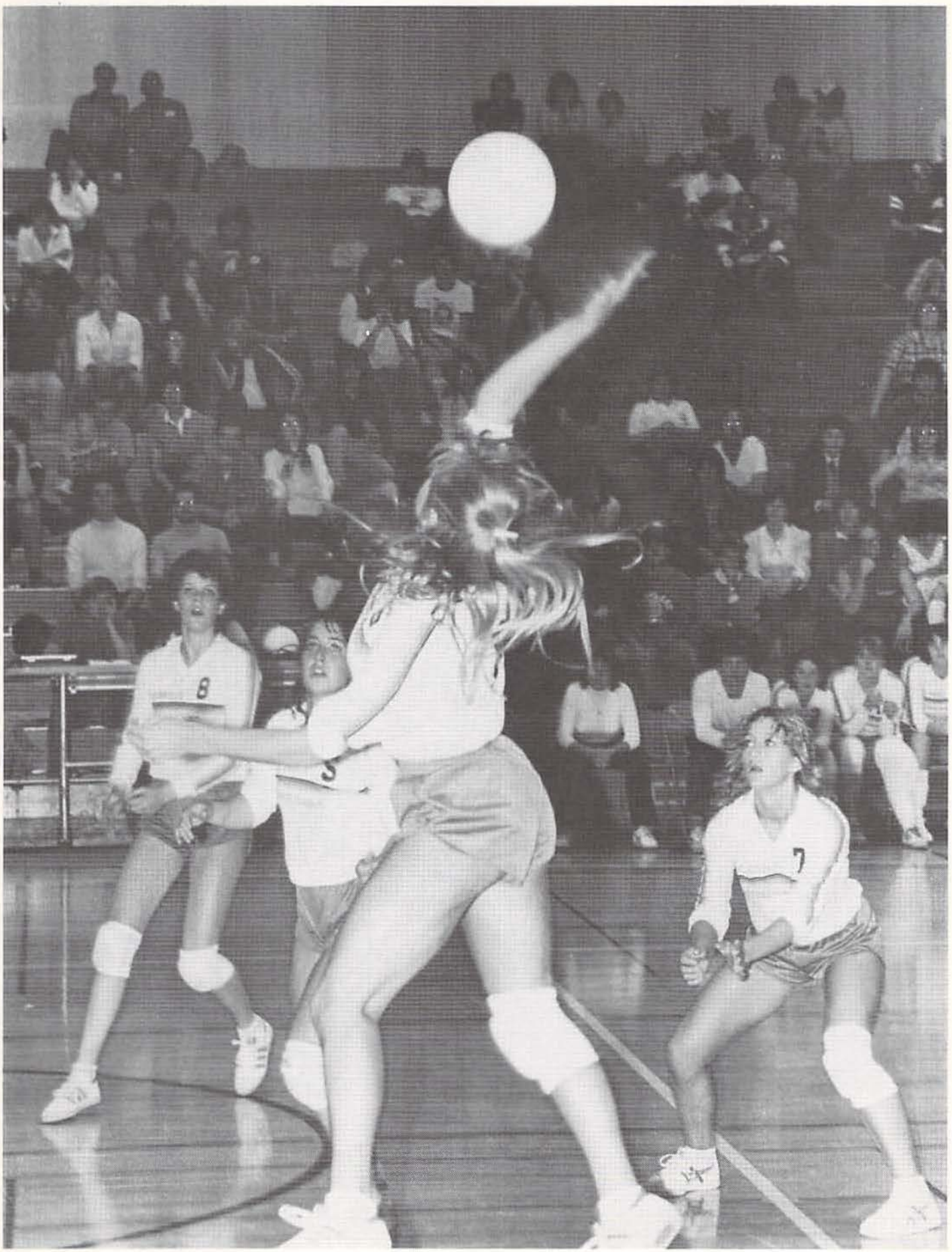
Advanced Engr. Math. Electives	3
Geology Elective	3

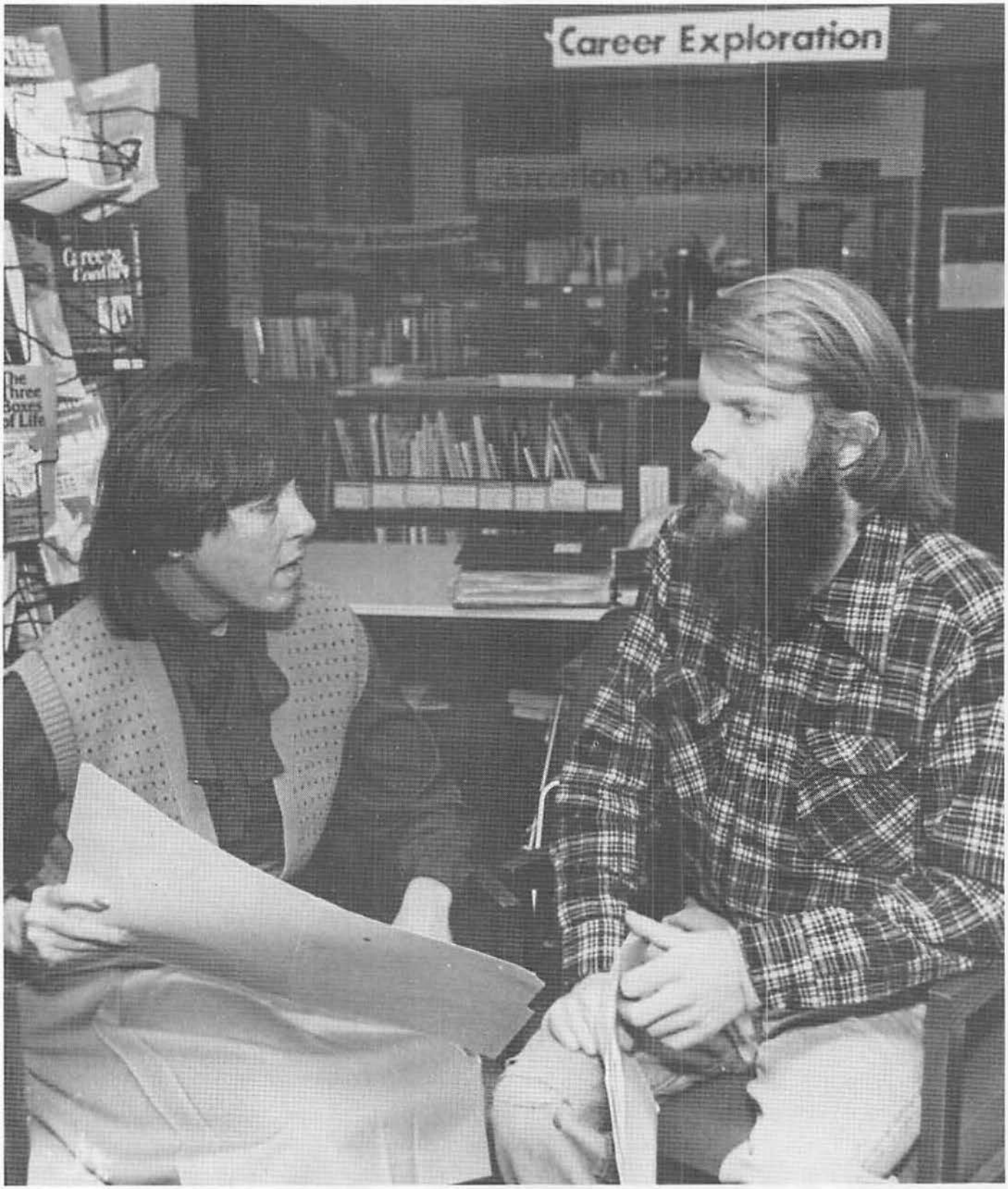
C. Two additional petroleum engineering electives will be required from the following list of courses to be offered in rotation, each course being taught every third semester:

Pet.E. 661 — Advanced Well Testing	3
Pet.E. 662 — Enhanced Oil Recovery	3
Pet.E. 663 — Advanced Reservoir Simulation	3
Pet.E. 664 — Geothermal Reservoir Engineering	3
Pet.E. 665 — Advanced Phase Behavior	3
Pet.E. 666 — Arctic Drilling and Well Completion	3
Pet.E. Elective	6

D.

Pet.E. 699 — Thesis	6




Career Exploration

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Course Descriptions

Course Numbers

The first numeral of a course numbered in the hundreds indicates the year in which the course is normally offered in its own department. For example, Engl. 111 is given for first-year students and Engl. 318 is given for third-year students. Freshman and sophomore students are cautioned to register for upper division (300 and 400) level courses only if they have had adequate preparation and background to undertake advanced study in the field in which those courses are offered.

100-299 — Lower-division courses.

300-499 — Upper-division courses. Freshman and sophomore students may be required to obtain special permission to take 300 and 400 level courses unless such courses are required in the first two years of their curriculum as printed in this catalog.

500-599 — Post-baccalaureate courses which are considered professional and specialized. Such courses are not interchangeable with 600 level courses for graduate degree programs.

600-699 — Graduate courses to which a few well qualified undergraduates may be admitted with the permission of the head of the department in which the course is offered.

Special or Reserved Numbers — Courses identified with numbers ending in -92 are seminars; ending in -93 are special topics courses, approved to be offered only during one academic year; -94, approved trial courses; -95, special topics summer session courses, offered only during the summer; -97 indicates individual study -98, individual research; -99, thesis.

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

Course Credits

One credit represents satisfactory completion of 840 minutes of lecture or 1680 or 2520 minutes of laboratory, whichever is appropriate. Credit hours may not be divided, except one-half credit hours may be granted at the appropriate rate. For short courses and classes of less than one semester in duration, course hours may not be compressed into fewer than *three days per credit*,and no more than one credit may be earned per week, per student.

Following the title of each course, the figures in parentheses indicate the number of lecture and laboratory hours the class meets each week for one semester. The first, lecture hours; the second, laboratory. For example (2+3) indicates that a class has two hours of lecture and three of laboratory work week.

The number of credits listed is for each semester. Thus "3 credits" means three credits may be earned.

Credit may not be given more than once for the completion of a course unless the course has been designated as repeatable for credit.

Course Classification

Courses that may be used in satisfying generally stated degree requirements (e.g., "social science elective") are classified in the course listings by the following designators: s-Social Sciences; n-Natural Sciences; and h-Humanities. For instance, Hist. 341, History of Alaska (3+0)s may be utilized to satisfy the "social science elective" requirement.

Accounting

Admittance to upper division School of Management courses will be granted only to students with junior standing or above. Others will be admitted only with the written permission of the appropriate department head.

Acct. 101 3 Credits Fall and Spring
Elementary Accounting (3+0)
An introduction course in accounting concepts and procedures for service businesses and for merchandising businesses owned by a single proprietor.

Acct. 102 3 Credits Fall and Spring
Elementary Accounting (3+0)
A continuation of introductory accounting concepts and procedures emphasizing the problems of businesses organized as partnerships or corporations and performing manufacturing operations. (Prerequisite: Acct. 101.)

Acct. 203 3 Credits Spring
Governmental Accounting (3+0)
Principles and operation of fund accounting; financial reporting, budgetary control for governmental, municipal and non-profit organizations. (Prerequisite: Acct. 101.)

Acct. 310 3 Credits Fall
Income Tax (3+0)
A study of federal and state income taxes relating primarily to the individual residing in Alaska and an introduction to corporate income taxation. The course entails tax reporting, planning, and research. (Prerequisite: Acct. 102 or permission of instructor.)

Acct. 316 3 Credits Spring
Accounting Information Systems (3+0)
The design and analysis of accounting systems for business entities in various industries. Internal control for the business, data processing and its relationship to accounting systems examined. (Prerequisite: Acct. 102.)

Acct. 323 3 Credits Alternate Fall
Petroleum Accounting (3+0)
Financial reporting and accounting for the petroleum industry with an emphasis on the exploration, development and production phases of oil and gas operations. (Prerequisites: Acct. 101 and 102 or permission of instructor. Next Offered: 1985-86.)

Acct. 342 3 Credits Spring
Managerial Cost Accounting (3+0)
A cost accounting course with a managerial emphasis focusing on cost-volume-profit analysis, job order and process costing, joint costs, by-products, inventory costing alternatives, systems design, responsibility accounting, profit planning, standard costs, and flexible budgeting. This course is designed for accounting majors. (Prerequisite: Acct. 102.)

Acct. 352 3 Credits Fall
Management Accounting (3+0)
A managerial accounting course focusing on business policy profit planning, resource planning, control concepts, reporting for management control, and the impact of public reporting on management decisions. (Prerequisites: Acct. 101 and Acct. 102.)

Acct. 361 **3 Credits** **Fall**
Acct. 362 **3 Credits** **Spring**
Intermediate Accounting (3 + 0)
A treatment in depth of the balance sheet accounts and procedures for their analysis and correction. Study of working capital and fixed assets will receive special emphasis during fall semester. Special attention will be given to long-term liabilities and stockholders' equity during spring semester. (Prerequisite: Acct. 102.)

Acct. 401 **3 Credits** **Fall**
Advanced Accounting (3 + 0)
A thorough study of accounting for parent-subsidiary relationships, partnerships, and fiduciaries. The principles of fund accounting will be introduced and international accounting problems will be emphasized. (Prerequisite: Acct. 362.)

Acct. 403 **3 Credits** **Spring**
Advanced Taxes (3 + 0)
A study of federal income tax for all entities, gift, estate, and payroll taxes. The course entails tax research, tax planning, and tax reporting for domestic and foreign tax payers. (Prerequisite: Acct. 310.)

Acct. 404 **3 Credits** **Fall**
Controllership and International Accounting (3 + 0)
A study of the controllership function in contemporary organizations with emphasis upon international accounting in multinational enterprises and selected cases in management accounting for governmental entities. (Prerequisites: All 300 level accounting major requirements; B.A. 325, 343 and 360; and Acct. 401 which may be taken concurrently.)

Acct. 405 **3 Credits** **Spring**
Contemporary Issues in Accounting (3 + 0)
A study of current developments in financial and managerial accounting theory and research. Relevant court cases, SEC rulings, FASB and AICPA publications, and academic accounting research will be emphasized. (Prerequisite: Acct. 401.)

Acct. 452 **3 Credits** **Fall**
Auditing (3 + 0)
A study of the procedures for verification of financial data and the professional standards applicable to the auditor's examination of financial statements and his expression of opinion relative to them. (Prerequisite: Acct. 362.)

Acct. 471 **3 Credits** **Alternate Fall**
Tax Planning and Research (3 + 0)
Tax planning and research primarily for business organizations. Tax planning for estates, trusts, and individuals will be examined. The course is designed for tax practitioners as well as for students without work experience in taxation. (Prerequisites: Acct. 310 and 403 or permission of instructor. Next offered: 1984-85.)

Acct. 472 **3 Credits** **Spring**
Computer Control and Advanced Auditing (3 + 0)
An examination of advanced auditing theory and practice, including audit techniques and internal control of computer systems. The course is designed for auditor practitioners as well as for students without field experience in auditing. Materials Fee: $20.00. (Prerequisites: Acct. 316 and Acct. 452. This course assumes prior exposure to auditing and information systems.)

Acct. 473 **3 Credits** **Fall**
Applied Systems Design (3 + 0)
The development and implementation of a computer-based accounting information system for a small business or not-for-profit entity. Materials Fee: $20.00. (Prerequisites: Acct. 316, 342 and 362.)

Acct. 481 **1 Credit** **Spring**
Personal Tax Planning (1 + 0)
The course will concern personal tax planning rather than tax preparation. The course will focus on the provisions of tax law affecting the individual taxpayer. (Prerequisites: Upper division standing, permission of instructor.)

Acct. 482 **1 Credit** **Spring**
Business Tax Planning (1 + 0)
The course will concern business tax planning rather than tax preparation. The course will focus on applicable tax credits, business deductions, profit sharing plans, and various state taxes. (Prerequisites: Upper division standing or permission of instructor.)

Acct. 483 **1 Credit** **Spring**
Estate Tax Planning (1 + 0)
The course will entail estate tax planning. The course will focus on gift, estate, and social security taxes. (Prerequisites: Upper division standing or permission of instructor.)

Acct. 502 **3 Credits** **Spring**
Financial Accounting Concepts for Administrators (3 + 0)
A complete and balanced treatment of the concepts, procedures and uses of financial accounting, including the accounting cycle, mass processing of transactions, internal control, inventories and merchandising operations, long-lived assets and liabilities, corporate accounting and reporting, partnership accounting, accounting principles, interpretation of financial statements, consolidated financial statements, analysis of funds flow, manufacturing operations and cost systems, managerial accounting and capital budgeting. (Prerequisite: Graduate Standing.)

Acct. 650 **3 Credits** **Spring**
Management Accounting Seminar (3 + 0)
Use of accounting information for managerial decisions, planning and control in economic entities. Topics covered include: the accounting process, responsibility accounting, performance measurement, capital budgeting, financial analysis and financial reports for managers, government, investors and the public. Student participation will include problem analysis and oral and written report preparation. (Prerequisite: Graduate standing. Acct. 101 and 102, or permission of instructor.)

Acct. 623 **3 Credits** **Fall**
Land Valuation and Petroleum Accounting (3 + 0)
Accounting concepts and principles, financial reporting and basic tax procedures applicable to the petroleum industry. (Prerequisites: Graduate standing and permission of instructor.)

Agriculture and Land Resources

A.L.R. 101 **3 Credits** **Fall**
Conservation of Natural Resources (3 + 0)
Consideration of natural resources including discussion of their biological and physical nature, social and economic aspects of use, conflicts of use, and alternative means for conservation. Majors in all fields are welcome.

A.L.R. 201 **3 Credits** **Fall**
Processes of Natural Resources Management (3 + 0)
An introductory course in management institutions and processes for students in agriculture, natural resources, wildlife, fisheries, environmental quality science, and related disciplines. Emphasizes publicly controlled lands and resources, particularly renewable resources, but addresses the role of private firms and native regional village corporations as well. (Prerequisites: ALR 101, sophomore standing or above.)

A.L.R. 300 **1-3 Credits** **Fall, Spring, Summer**
Internship in Natural Resources Management
Supervised programs designed to provide carefully selected upper division or graduate students with practical experience working with government units or agencies in natural resources management. Opportunities to apply theories and practical application, observe procedures and operations of the agencies, and become better prepared for professional employment. (Prerequisite: A.L.R. 101, at least upper division standing, and permission of instructor.)

A.L.R. 310 **3 Credits** **Spring**
Agricultural Concepts and Techniques (3 + 0)
Concepts and techniques of agriculture in its broadest sense as related to past, present, and future cultures; food and fiber production; uses of wild and domestic plants and animals; esthetics; and quality and protection of the environment. (Prerequisite: Biol. 105, 106; Chem. 105, 106.)

A.L.R. 311 **3 Credits** **Alternate Fall**
Introduction to Agronomy and Horticulture (2 + 3)
Principles of plant science as related to production of economic crops, with special attention to those grown in Alaska. (Prerequisite: A general course in botany. Next offered: 1985-86.)

A.L.R. 312 3 Credits Alternate Fall
Range Management (3 + 0)
Principles of management of grazing lands for livestock production; relationships with and similarities to habitat use by wildlife; range plant ecology; and techniques for range improvement and development. Includes detailed discussions of Alaskan conditions and animals such as reindeer, muskox, and bison. (Prerequisites: Biol. 105-106, Biol. 239, A.L.R. 320 and 321 highly recommended. Next offered: 1986-87.)

A.L.R. 313 4 Credits Alternate Spring
Introduction to Plant Pathology (3 + 3)
An introduction to the field of plant pathology; non-parasitic and parasitic causes of plant diseases; methods of plant infestation and mechanism of plant defenses; epidemiology and disease control. (Prerequisites: Biol. 105 and 106; Biol. 239 recommended. Next offered: 1986-87.)

A.L.R. 320 3 Credits Alternate Fall
Introduction to Animal Science (2 + 3)
Origin, history, and economic significance of breeds of dairy and beef cattle, swine, sheep, and poultry. Discussion of reindeer, bison, and musk-ox. Introduction to management and production systems with special reference to Alaska. (Prerequisite: A course in general biology. Next offered: 1986-87.)

A.L.R. 321 3 Credits Alternate Fall
Applied Animal Nutrition (2 + 3)
Application of feeding standards and feedstuffs analysis to the nutrition of farm animals. Comparative anatomy of the digestive system of pig, horse, and cow. (Prerequisite: A course in general biology. Next offered: 1985-86.)

A.L.R. 340 3 Credits Spring
Natural Resources Measurements (2 + 3)
Introduction to the techniques and instrumentations used in the measurement and inventory of natural resources. Measurements used by managers of land, timber, range, wildlife, water, and recreation resources will be discussed. (Prerequisites: junior standing or permission of instructor.

A.L.R. 350 3 Credits Spring
Introduction to the Forest System (2 + 3)
The physiological and ecological foundations for forest resource management. Forestry concepts involving soils, silvics, silviculture, fire, pathology, and entomology are discussed. Emphasis on Alaska's forest resources. (Prerequisites: Biol. 271 and A.L.R. 101 or permission of instructor.)

A.L.R. 360 3 Credits Alternate Spring
Outdoor Recreation Planning (3 + 0)
The course develops on the basic theory and practices related to the allocations of natural resources for recreational purposes, including concomitant services related to that use. Macrobehavioral patterns are studied as they influence the allocation process. (Prerequisites: A.L.R. 101 and Econ. 235 or equivalent, or with permission of instructor. Next offered: 1985-86.)

A.L.R. 370 3 Credits Fall
Introduction to Watershed Management (2 + 3)
Examination of the hydrologic cycle and the influence of land management techniques on water quantity, quality, and timing. Topics of water yield, soil erosion and non-point pollution, snowpack management, and land use alternatives will be discussed. (Prerequisites: Biol. 239, and Geos. 101, or permission of instructor.)

A.L.R. 380 3 Credits Spring
Soils (2 + 3)
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. 105.)

A.L.R. 400 3 Credits Alternate Spring
Natural Resource Policies (3 + 0)
The origin, development, and significance of major public policies in fields such as forest management, water resources, outdoor recreation, public land management, wildlife management, mineral and petroleum resources, and agriculture. Focuses on Alaskan issues and national issues relevant to the problems of northern natural resource management. (Prerequisites: Upper division or graduate standing. Next offered: 1985-86.)

A.L.R. 401 3 Credits Alternate Spring
Natural Resources Legislation (3 + 0)
An examination of the background and potential importance of selected federal and Alaskan legislation in the fields of land use, land planning, and resource development and management. A study of the legislative process of policy development. (Prerequisites: Junior, senior, or graduate standing with major in agriculture, wildlife, fisheries, natural resources management, or, with instructor's permission, related fields. (Next offered: 1986-87.)

A.L.R. 403 3 Credits Alternate Spring
Farm Planning and Management (3 + 0)
Overview of all aspects of farm and ranch management, emphasizing decision making, use of available economic tools, farm planning, and development of alternate farm plans, and farm and ranch accounting and monitoring. Addresses practical farm management and examines alternatives to traditional agriculture in light of changing economic conditions. Detail on Alaskan farm management practices and procedures. (Prerequisites: A.L.R. 311, A.L.R. 320, Econ. 235, Econ. 335 or permission of instructor. Next offered: 1985-86.)

A.L.R. 411 3 Credits Alternate Fall
Plant Propagation (2 + 3)
Principles of plant propagation, including seeds, bulbs, divisions, layers, cuttings, buds, grafts, and rootstocks. Where possible, emphasis will be placed on the propagation of indigenous plants. (Prerequisites: A.L.R. 311 or permission of instructor. Next offered: 1986-87.)

A.L.R. 412 3 Credits Alternate Fall
Field Crop Production (3 + 0)
An applied course in agronomy for both undergraduate and graduate students. The subject matter will emphasize agronomic principles and practices that are involved in the production, storage, marketing, and utilization of field crops. (Prerequisites: A.L.R. 311. Next offered: 1986-87.)

A.L.R. 420 3 Credits Alternate Spring
Animal Nutrition and Metabolism (3 + 0)
Nutrition and metabolism of domestic animals; ruminant and monogastric. (Prerequisites: Chem. 105, 106; biochemistry recommended. Next offered: 1985-86.)

A.L.R. 425 2 Credits Fall
Alaska's Reindeer Industry (2 + 0)
Alaska's reindeer industry will be examined as a practical case in natural resources management. Social, economic, historical, and ecological aspects will be addressed. Emphasis will be placed on (1) the multi-disciplinary nature of natural resource management and planning; and (2) the coordination of agency and private involvement in management of the reindeer industry's resource base. (Prerequisites: ALR 101, Junior standing or permission of instructor.)

A.L.R. 430 3 Credits Spring
Land-Use Planning (3 + 0)
Land use and resources planning principles and practices in the United States, with primary emphasis on the state and regional levels, and with special attention to Alaska. (Prerequisite: Upper division standing.)

A.L.R. 450 3 Credits Alternate Fall
Forest Management (3 + 0)
Introduction to forest land management for production of goods and services; relation of timber production to other forest land uses; topics include sustained yield, allowable cut, management planning inventory, valuation. (Prerequisites: A.L.R. 350, Econ. 235, or permission of instructor. Next offered: 1986-87.)

A.L.R. 451 3 Credits Alternate Spring
Regeneration of Alaskan Woody Plants (3 + 0)
Consideration of major aspects of reproduction and regeneration of important woody plants in Alaska. The course will be particularly useful to persons presently or potentially working in land management involving vegetation type conversions, sustained harvest, rehabilitation, and related fields. (Prerequisites: Courses in botany, forestry, or related fields, or permission of instructor. Next offered: 1986-87.)

A.L.R. 452 3 Credits Alternate Spring
Forest Protection (3+0)
The basic principles and practical management systems for forest protection from fire, insects, and diseases are presented. Emphasis is on understanding the role of these factors in managing forest ecosystems, and problems and techniques particularly important in the forest of high latitudes, especially in Alaska. (Prerequisites: Biol. 105, 106, 271, 239; A.L.R. 350 or instructor's permission. Next offered: 1985-86.)

A.L.R. 453 3 Credits Alternate Fall
Harvesting and Utilization of Forest Products (3+0)
The first half of this course will be an in-depth study of timber harvesting systems including timber cutting, yarding, and transport processes. Both manual and mechanized aspects will be considered. The second half of the course will cover the technology of processing wood into various products including lumber, plywood, veneer, pulp, and energy. (Prerequisites: A.L.R. 101 and 350. Next offered: 1986-87.)

A.L.R. 460 3 Credits Fall
Principles of Outdoor Recreation Management (2+3)
Theories, practices, economics, and problems fundamental to the use of land and related natural resources for recreation. (Prerequisite: Junior standing or permission of the instructor.)

A.L.R. 461 3 Credits Alternate Spring
Interpretive Services (3+0)
Naturalist and other visitor programs in outdoor recreation areas: philosophy, planning, and development of interpretive programs; resources, agencies, users, interpretive media, and program evaluation. (Prerequisites: At least junior standing or permission of instructor. Next offered: 1986-87.)

A.L.R. 462 3 Credits Fall
Alaskan Environmental Education (3+0)
(Same as ED. 462)
Environmental concepts, motivational and discovery techniques, and practical skills for utilizing the environment inside and outside the formal classroom in all subject areas. Course content includes information on curriculum materials (K-12), interpretive and audiovisual aids facilities, environmental problem solving and applications of environmental education to situations from the public schools to summer campus, short courses, and workshops for individuals of any age. (Prerequisites: Junior standing or permission of instructor.)

A.L.R. 480 2 Credits Alternate Fall
Soil Management (2+0)
An applied course in soil science for both undergraduate and graduate students. The subject matter will emphasize soil management principles and practices that increase crop yields and reduce soil losses from wind and water erosion. (Prerequisites: A.L.R. 380. Next offered: 1985-86).

A.L.R. 630 3 Credits Alternate Fall
Regional Planning (3+0)
An advanced course in which specific problems in regional planning, of importance to Alaska, are considered in depth. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1986-87.)

A.L.R. 631 3 Credits Alternate Spring
Regional Planning Practicum (3+0)
Application of planning theories and methods to specific regional problems in Alaska. Students will work in small teams on problems illustrating regional development, land use planning, environmental management, growth policy, and other issues in Alaska. (Prerequisite: A.L.R. 630 or permission of instructor. Next offered: 1986-87.)

A.L.R. 640 3 Credits Alternate Spring
Simulation and Modeling in Resource Management (3+0)
An introduction to and discussion of the use of simulation and modeling in natural resource management. Emphasis on concepts, strategies, and case studies. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1985-86.)

A.L.R. 641 3 Credits Alternate Spring
Natural Resources Applications of Remote Sensing (2+3)
An introduction to the interpretation of remote sensing data and applications to natural resources. Course topics include a discussion of types of remote sensing data and product displays, the advantages and limitations of data types, and techniques of data interpretation for various natural resources problems. Emphasis is placed on vegetation survey and inventory, wildlife habitat, forest and range management, agriculture, geo-botanical correlations, and change detection-monitoring. Techniques include manual interpretation and computer-aided analysis. (Prerequisites: Geos. 422 or permission of instructor. Next offered: 1986-87.)

A.L.R. 670 3 Credits Alternate Fall
Biometeorology (3+0)
Solar radiation, energy balance relationships, and disposal of incident energy at the earth's surface; physical environment in relation to biological activity of plants and animals. Concepts emphasized. (Prerequisites: Calculus, physics, biology or permission of the instructor. A.L.R. 350 recommended. Next offered: 1985-86.)

A.L.R. 675 3 Credits Alternate Fall
Applied Ecosystem Science (3+0)
Modern concepts of ecosystem science and their application to solving problems of land use and management. Worldwide patterns and control processes of and management implications for major ecosystems. Designed for students in biology and renewable resources management. (Prerequisites: Undergraduate major in biological sciences or renewable resources including at least one course in ecology, one approved college-level mathematics course and graduate standing or permission of instructor. Next offered: 1986-87.)

A.L.R. 680 3 Credits Alternate Fall
Environmental Decision-Making (3+0)
Analyzes theoretical and practical problems of prediction from the standpoint of social, environmental, and economic disciplines. Examines the potential and actual role of scientific prediction in political decision-making especially through the National Environmental Policy Act's Environmental Impact Statement process and similar state legislation. (Prerequisites: Graduate status or upper division standing and permission of instructor. Next offered: 1986-87.)

Alaska Native Languages

ANL 141 3 Credits Alternate Fall
ANL 142 3 Credits Alternate Spring
Beginning Athabaskan — Koyukon (3+0) h
An introduction to Koyukon, the Athabaskan language of the Koyukuk and Central Yukon rivers, open to both speakers and non-speakers. For speakers, the course provides literacy and grammatical analysis. For others, it provides a framework for learning to speak, read, and write the language. (Next offered: 1985-86.)

ANL 215 3 Credits Fall
ANL 216 3 Credits Spring
Alaska Native Languages (3+0) h
A survey of all Native languages of Alaska, open to all students. History, present, and future of these languages; examples of Indian and Eskimo language structures, with native speakers in class; present situation and prospects for the future as a cultural and political force in Alaska and elsewhere. Fall semester devoted mainly to Eskimo and Aleut; Spring to Athabaskan, Eyak, Tlingit, Haida, Tsimshian. Semesters may be taken independently.

ANL 241 3 Credits Alternate Fall
ANL 242 3 Credits Alternate Spring
Intermediate Athabaskan — Koyukon (3+0) h
Continuation of Elementary Athabaskan — Koyukon, concentrating on development of conversational ability with presentation of additional grammar and vocabulary. (Prerequisites: ANL 141 and 142 or permission of instructor. Next offered: 1985-86.)

ANL 387 3 Credits Fall
ANL 388 3 Credits Spring
Bilingual Methods and Materials (3+0) h
Training and research in bilingual education methods in Alaska Native languages and preparation of books and materials in any of them.

Alaska Native Studies

ANS 120 3 Credits Fall
Cultural Differences in Institutional Settings (3+0) s
Introduction to the phenomena of culturally organized thought processes, with emphasis on the communication patterns resulting from the interaction of peoples from different linguistic/culture traditions in modern institutional settings. Special attention is paid to Alaskan Native and non-Native communication patterns.

ANS 160 1 Credit Spring
Alaska Native Dance (2+0) h
Traditional Native Alaskan songs and dances will be learned, utilizing guest Native dancers and elders from throughout the state representing the major indigenous groups. The class will often participate in the Festival of Native Arts.

ANS 161 3 Credits Fall
Introduction to Tuma Theatre (3+0) h
(Same as THR 161)
Introduction to the development and performance of original and traditional theatrical works derived from various Alaska Native cultural heritages and experiences. This course is a prerequisite for ANS/THR 361, Advanced Tuma Theatre and for membership in the Tuma Theatre touring company.

ANS 250 2 Credits Fall and Spring
Current Alaska Native Leadership Perspectives (2+0) s
Prominent leaders in the Native community are brought into direct classroom contact with students to discuss important issues in which they are involved. Other issues, as identified in classroom discussion, will be addressed.

ANS 251 1-3 Credits Fall and Spring
Practicum in Native Cultural Expression (0+variable)
Students actively and regularly engaged in the formal organization, promotion, and expression of Alaskan Native cultural heritage may enroll in this practicum for 1-3 credits. The practicum may be repeated through three semesters providing the accumulated credits do not exceed three. (Prerequisite: Permission of the Head, Alaska Native Studies Program.)

ANS 301 3 Credits Fall
Native Cultural Heritage Documentation (3+0) h
A study of the methods by which significant but disappearing aspects of Native traditional life may be documented for purposes of preservation and/or revitalization. Students are expected to accomplish research and analysis in cultural heritage. This course is particularly suitable for students actively engaged in cultural heritage expression through the creative arts, Native language programs, media productions, etc. (Prerequisites: Hist. 100 and Anth. 242 or permission of instructor.)

ANS 310 3 Credits Fall
The Political Economy of ANCSA (3+0) s
Analysis of the implementation of the Alaska Native Claims Settlement Act (ANCSA). Examination is made of goals and methods of the different Native corporations as they establish themselves within the larger political economy. (Prerequisites: Anth. 242 or P.S. 263 or Hist. 100; Econ. 101 and Econ. 137; or permission of instructor.)

ANS 320 3 Credits Spring
Language and Ethnicity: Applications to Alaska (3+0) s
Examination of aspects of language, ethnicity, and their interrelationships. Emphasis is placed on the systems language uses to communicate ethnic identity and how communication between ethnic groups is affected by patterns of language use. The potential effects of current developments in communication media on language usage will also be examined. Special attention is paid to the applicability of these concepts to Native/non-Native communication patterns. (Prerequisites: ANS 120 and ANL 215 or 216; or permission of instructor.)

ANS 325 3 Credits Spring
Native Self Government (3+0) s
(Same as P.S. 325)
Comparative study of indigenous political systems, customary law and justice in Native Alaska with emphasis on the organization of Native self-government under Federal Indian Law and under Alaska State chartered local government options and on comparisons between Alaska Native political developments and those of tribes in the contiguous 48 states. (Prerequisites: Hist. 100, P.S. 263.)

ANS 351 1-3 Credits Fall and Spring
Practicum in Native Cultural Expression (0+variable)
Students actively and regularly engaged in the formal organization, promotion, and expression of Alaskan Native cultural heritage may enroll in practicum. These activities may be with Festival of Native Arts administration, Tuma Theatre, Theata magazine, etc. A maximum of 3 practicum credits can be applied toward a Native Studies major or minor. (Prerequisites: Permission of instructor required.)

ANS 361 3 Credits Fall
Advanced Tuma Theatre (3+0) h
(Same as THR. 361)
Continuation of ANS/THR 161 with emphasis on performance of previously prepared materials. Rehearsals during the first half of the semester will be followed by local area performances. Upon successful completion of the course, students will be eligible for the Tuma Theatre Company's spring and summer tours (see Thr. 101-401). (Prerequisites: ANS/THR 161 and one of the following: Thr. 221, Thr. 241, Thr. 343, Thr. 347 or permission of instructor.)

ANS 375 3 Credits Spring
Native American Religion and Philosophy (3+0) h
A study of the philosophical aspects of Native American world views, with emphasis on systems of belief and knowledge, explanations of natural phenomena, and relations of human beings to the natural environment through ritual and ceremonial observances. (Prerequisites: Anth. 242 or permission of the instructor; Phil. 201 is recommended.)

ANS 401 3 Credits Fall and Spring
Knowledge of Native Elders (3+0) h
Intensive study with prominent Native tradition-bearers in Native philosophies, values, and oral traditions. Emphasis is on eliciting this traditional knowledge through methods and conventions of the cultural heritage documentation process. (Prerequisites: Hist. 100 or Anth. 242 and upper division standing.)

ANS 415 3 Credits Spring
Comparative Economic Development Processes: Applications for Native Alaska (3+0) s
Comparative examination of economic development processes in third and fourth world societies. Emphasis is placed on the identification of different economic development theories and practices, and on their applicability to socioeconomic conditions of Alaska Native people. (Prerequisites: Anth. 242 or Hist. 100; Econ. 101; or permission of instructor.)

ANS 425 3 Credits Fall
Federal Indian Law and Alaska Natives (3+0) s
As a result of transfers of land ownership and recognition of tribal sovereignty, a "special relationship" has developed between the federal government and Native Americans. This course examines federal Indian law and policy as it has developed under this relationship. Emphasis is given to the legal rights and status of Alaska Natives. (Prerequisites: P.S. 101 and Hist. 100; or permission of instructor; P.S. 263 is recommended.)

ANS 430 3 Credits Fall
Alaska Native Education (3+0) s
Examination of the development of Alaskan Native education, with emphasis on the structure and function of the different school systems historically serving Native people and on current efforts toward local control. (Prerequisites: Anth. 242 or Hist. 100; or permission of instructor.)

ANS 475 3 Credits Spring
Alaska Native Social Change (3 + 0) s
Study is made of tradition and change in Native social institutions in contemporary society. Attention is given to methods of identifying and analyzing significant Native social change processes for better public understanding. (Prerequisites: Anth. 242 or permission of the instructor.)

Anthropology

Anth. 101 3 Credits Fall and Spring
Introduction to Anthropology (3 + 0) s
An introduction to the general field of anthropology, including the physical and social/cultural aspects of man. The course is designed to introduce the basic ideas, methods, and substantive results of anthropology to those desiring some understanding of what anthropology does, how it does it, who does it and where, and something of what has been learned about the variations and similarities of human beings.

Anth. 111 3 Credits Alternate Spring
Ancient Civilizations (3 + 0) s
A survey of the major civilizations of the Old and New World from a comparative, anthropological perspective. Antecedents and influences of these civilizations on their neighbors will be stressed. Major societal institutions to be considered include economics, science, religion, and social organization. (Next offered: 1986-87.)

Anth. 121 3 Credits Alternate Spring
Human Origins (3 + 0) n
A general review of human origins and evolution based on evidence from the fossil record and the anatomy and behavior of nonhuman primates, bio-behavioral trends in hominid evolution, modes of communication and the origin of language, and the biocultural consequences of big-game hunting. (Next offered: 1985-86.)

Anth. 123 3 Credits Alternate Fall
Introduction to Alaskan Archaeology (3 + 0) s
Origins and affinities of native Alaskan peoples are examined from an archaeological perspective. Native groups whose prehistory is examined include Yupik, Inupiaq, Aleut, Tlingit, and Athapaskan. (Next offered: 1985-86.)

Anth. 176 3 Credits As Demand Warrants
Anthropology of American Society and Culture (3 + 0) s
Concentrates on the study of American culture and society from the point of view of anthropology. Various aspects of American culture will be addressed: patterns and processes of American lifestyle; values; structure and organization of subcultures. The approach to American culture and society will be comparable to that taken with primitive and peasant societies.

Anth. 200 3 Credits Alternate Fall
Social/Cultural Anthropology (3 + 0) s
A more advanced introduction to social and cultural anthropology designed to be of interest to majors and non-majors. Examination of a variety of social and cultural systems with emphasis on kinds of problems with which anthropologists struggle in seeking to understand the structure, process, and the role of the individual in such systems. Conceptual framework and methodology which social and cultural anthropologists employ in attempting to analyze social action will be closely examined. The course will attempt to develop in the student an awareness of the gaps between the common sense views of our culture and a scientifically adequate account of human action. (Next offered: 1986-87.)

Anth. 203 3 Credits Every Third Spring
Women in Society (3 + 0) s
An examination of the nature of sex roles cross-culturally. The history of the study of sex roles, with an emphasis on female roles, in anthropology is discussed. Current research on the biological and cultural aspects of these rules is presented and various hypotheses in anthropology regarding male and female behavior cross-culturally are discussed and supplemented by in-depth studies of cultures representing different types of techno-environmental adaptation — hunting, horticultural, pastoral, agricultural, and industrial societies. (Next offered: 1986-87.)

Anth. 204 3 Credits Every Third Spring
Language and Culture (3 + 0) s
The role of language and linguistics in anthropology, language differences and cultural differences; the nature of language and its study, and the interrelationships of language and culture/society. Current theories of ethnolinguistics and ethnoscience, sociolinguistic, and language origins are also discussed. (Prerequisites: Anth. 101. Next offered: 1985-86.)

Anth. 205 3 Credits Alternate Fall
Native Cultures of North America (3 + 0) s
A survey course of the native peoples and cultures of North America with respect to their environmental setting and the major institutions of society. (Next offered: 1985-86.)

Anth. 206 3 Credits Every 3 Years
Native Cultures of South America (3 + 0) s
A survey of the native peoples of South America in their natural settings with a focus on the social, economic, political, and religious life. (Next offered: 1985-86.)

Anth. 211 3 Credits Alternate Fall
Fundamentals of Archaeology (2 + 3) s
A study of the development and methods of archaeology emphasizing the historical background of the discipline and the different approaches characteristic of its development. The application of basic archaeological techniques is illustrated through the use of a study module which presents the raw data from an excavation as well as a collection of artifacts which the class analyzes and discusses in terms of possible interpretations using the methods and techniques of archaeology as presented in the first part of the course. (Next offered: 1985-86.)

Anth. 222 3 Credits Alternate Spring
Human Evolution (3 + 0) n
The fossils — their morphology, inferred functional and ecological relationships, geochronologic and geochronometric placements. Current taxonomic and phylogenic assessments, theories of evolutionary processes, behavioral primatology and the role of culture in hominid evolution are also major concerns. (Next offered: 1986-87.)

Anth. 242 3 Credits Spring
Native Cultures of Alaska (3 + 0) s
An introduction to the traditional Aleut, Eskimo, and Indian (Athabaskan and Tlingit) cultures of Alaska. Comparative information on Eskimo and Indian cultures in Canada is also presented. Includes a discussion of linguistic groupings as well as the cultural groups; presentation of population changes through time; subsistence patterns, social organization and religion in terms of local ecology. Precontact interaction between native groups of Alaska is also explored. This is a general introductory course presenting an overall view of the cultures of Native Alaskans.

Anth. 300 3 Credits As Demand Warrants
Anthropology of Religion (3 + 0) s
This course focuses on one of the more fascinating subsystems of human culture and society — religion or supernatural belief. As approached from the perspective of anthropology, the study of religion is both comparative and wide ranging. While much of the material will emphasize religion in the context of "primitive" society, its role in the more complex society will also be examined. Among the various topics the student can expect to encounter are: religious practitioners, ritual, belief systems, and the relationship of religious behavior to other aspects of social behavior. (Prerequisite: Junior standing or permission of instructor.)

Anth. 305 3 Credits As Demand Warrants
Comparative Political and Legal Systems (3 + 0) s
An examination of political systems and the law from a comparative standpoint. The primary focus will be on case studies drawn from non-industrial societies, developing nations, and parapolitical systems or encapsulated societies, such as native peoples in the U.S. Major areas of coverage will be political structures and institutions; social conflict, dispute settlement, social control and the law, political competition over critical resources; and ethnicity. (Prerequisites: Anth. 101 or 200 or permission of instructor.)

Anth. 306 3 Credits As Demand Warrants
Economic Anthropology (3+0) s
This course addresses the fundamental issue of the relationship between economic and other social relations. The primary focus is on preindustrial societies because a central task of the course is to determine the relevance of formal economics to small-scale societies and developing nations. Included for study are such topics as exchange, formal and substantive economics, market economics, rationality, political economy, and the economics of development. (Prerequisites: Anth. 101 or 200 or permission of instructor.)

Anth. 307 3 Credits Alternate Springs
Kinship and the Family (3+0) s
Examination through case studies of the forms and function of family and household organization, kinship and marriage in diverse human sociocultural systems. Case studies will be drawn from tribal and complex societies including contemporary United States. (Prerequisites: Anth. 101 or 200 or permission of instructor. Next offered: 1985-86.)

Anth. 309 3 Credits Every 3 Years
Arctic Prehistory (3+0) s
The archaeological cultures of the northern regions from the time of first occupation up to the ethnographic present. Particular attention will be paid to the adaptations to changing environments in time and space as seen through past technological and economic systems, as well as settlement patterns. (Prerequisites: Anth. 101 or 211, or permission of instructor. Next offered: 1986-87.)

Anth. 310 3 Credits Alternate Spring
New World Prehistory (3+0) s
The culture history of the Native Americans from their first entry into the New World up to the development of civilization in Mexico through important archeological sites which illustrate the different stages of their development. (Prerequisites: Anth. 101 or 211, or permission of instructor. Next offered: 1985-86.)

Anth. 312 3 Credits Alternate Fall
Old World Prehistory (3+0) s
The archeological record for the development of human culture from the very beginnings of humankind to the rise of civilization in the Old World. (Prerequisites: Anth. 101 or 211 or permission of instructor. Next offered: 1986-87.)

Anth. 315 3 Credits Alternate Fall
Human Biology (2+3) n
Modern human populations, including systematics, behavior, ecology, and inter- and intrapopulation genetic and morphological variations. Human adaptations to heat, cold, high altitudes, and changing nutritional and disease patterns. (Prerequisite: Anth. 222 or Biol. 105-106. Next offered: 1985-86.)

Anth. 321 3 Credits As Demand Warrants
Human Population Biology (3+0) n
An areal survey of the physical anthropology of the peoples of one major geographic region of the world. Areas to be covered during different semesters will include: Circumpolar regions, North and South America, and Oceania. The course will emphasize the analysis of patterns of biological variation within and between prehistoric and modern human populations in a given area. General problems to be considered include origins and historical relationships, analysis of microevolutionary processes and adaptation to climatic stress. (Prerequisite: Anth. 315 or permission of instructor.)

Anth. 410 3 Credits Alternate Fall
History of Anthropology (3+0) s
The major theoretical approaches in cultural/social anthropology presented chronologically from the formulation of the discipline of anthropology to current theory. The substance of the various approaches is used for discussions regarding the nature of the discipline, its goals and methods, and the relevance of theoretical perspectives to interpretations in anthropology. (Prerequisite: junior standing or permission of instructor. Next offered: 1986-87.)

Anth. 413 3 Credits Every Third Spring
Archeological Method & Theory (2+3) s
The history of archeological theory will be presented as the framework for discussion and assessment of different theoretical perspectives in archeology. These various perspectives will be illustrated through the study of their application to specific research problems. (Prerequisite: A course in archeology or permission of the instructor. Next offered: 1985-86.)

Anth. 414 3 Credits As Demand Warrants
Environmental Archeology (3+0) n
Introduction to Quaternary environmental reconstruction through the integration of geological, archeological, botanical, and zoological data. (Prerequisite: A course in archaeology or permission of the instructor.)

Anth. 421 3 Credits As Demand Warrants
Analytical Techniques (2+3)
Classification, sampling, collection and analysis of anthropological data: parametric and nonparametric significance tests and measures of association, analysis of frequency data, estimating resemblance using multiple variables, computer simulations and methods of illustrating results of analysis. (Prerequisites: Any 200 level Anthropology course. Next offered: 1985-86.)

Anth. 422 3 Credits As Demand Warrants
Human Osteology (2+3) n
Human skeletal analysis: bone biology, skeletal anatomy, aging and sexing, metric and nonmetric traits of skeleton and dentition, paleopathology, and paleodemography. Inferences on genetic relationships between and patterned behavior within prehistoric groups derived from skeletal material. (Prerequisite: Anth. 315 or permission of instructor).

Anth. 423 3 Credits Alternate Fall
Prehistoric China (3+0) s
Early hominid evolution and culture in China. Paleolithic traditions and adaptations, the process of neolithization, rise of the state and aspects of early science and philosophy which have their roots in prehistory are examined. (Prerequisites: Anth 211 or permission of instructor. Next offered: 1985-86.)

Anth. 428 3 Credits As Demand Warrants
Human Ecology (3+0) n
Human ecology attempts to understand man by studying individuals and human populations as biological entities profoundly modified by human society and culture. It is considered that animal and human ecology share some basic premises since man, in the native state, is born nearly hairless, naked, and is physiologically a tropical, sea-level dwelling primate. This course is concerned with some of the biobehavioral effects of ecological circumstances on man, expressed in human population size regulations, nutritional energetics, human adaptation, and cultural ecology. The "man in the ecosystem" approach will be utilized. (Prerequisite: Junior standing or permission of instructor.)

Anth. 601 3 Credits Alternate Fall
Proseminar in Social/Cultural Anthropology (3+0)
An intensive graduate level survey on the subdiscipline of social/cultural anthropology dealing with the methods and theories in the field. Special attention will be directed at examining the substantive materials resulting from social/cultural studies. (Prerequisites: Graduate standing or permission of instructor. Next offered: 1985-86.)

Anth. 611 3 Credits Alternate Fall
Proseminar in Archeology (3+0)
An intensive coverage of advanced topics in archeological theory, and techniques of data recovery and analysis. The course will emphasize both field and laboratory aspects as well as the substantive results of archeological research. (Prerequisites: Graduate standing or permission of instructor. Next offered: 1985-86.)

Anth. 612 3 Credits As Demand Warrants
Paleoecology (3+0)
Advanced study of Quaternary environments. The influences of climatic change and the interrelationships of physical and biological factors on the distribution and evolution of biota including humans will be discussed. (Prerequisite: graduate standing or permission of the instructor.)

Anth. 621 3 Credits Alternate Spring
Proseminar in Physical Anthropology (3+0)
An intensive graduate level survey of the subdiscipline of physical anthropology dealing with historical developments and current problems in the field. The general areas of human paleontology and human population biology will be stressed. (Prerequisites: Graduate standing or permission of instructor. Next offered: 1985-86.)

Anth. 622 **3 Credits** **As Demand Warrants**
Problems in Human Population Biology (3 + 0)
Preview of current methodological and theoretical advances in human population biology. Problem areas to be considered will include behavior, genetic analysis, the biological basis of human social behavior, phylogenetic reconstruction, the evidence for natural selection in human populations, human ecology, and demography. Emphasis will be placed on the recent literature of the field. (Prerequisites: Graduate standing or permission of instructor.)

Anth. 630 **3 Credits** **Alternate Spring**
Anthropological Field Methods (3 + 0)
This course concentrates on the practical concerns and aspects of doing anthropological field research. Students are exposed to the relevant literature and significant discussions on the different aspects of fieldwork. In addition, students will gain practical experience in the problems, techniques and methods of fieldwork involving people from similar or distinct cultural backgrounds. The preparation of research proposals is also given attention. (Prerequisites: Graduate standing or permission of instructor. Next offered: 1986-87.)

Anth. 640 **3 Credits** **As Demand Warrants**
Problems in Anthropology (3 + 0)
Examination and criticism of exemplary landmarks in the anthropological literature. The course will be devoted to a subdiscipline during each offering. (Prerequisites: Graduate standing or permission of instructor.)

Applied Linguistics

A.L. 300 **3 Credits** **Fall**
Applied Phonology (3 + 0)
Intensive analysis of the phonologies of Alaska's Native languages. The design of their practical orthographies and history of current writing systems. Philosophy and methodology of literacy teaching emphasized, and consideration given to the role of phonology in language maintenance and language change in Alaska today. May be repeated for credit only with change in topic. (Prerequisites: Ling 101; ANL 215 or ANL 216. Student must demonstrate knowledge of one ANL writing system, or permission of instructor.)

A.L. 310 **3 Credits** **Spring**
Applied Morphology and Syntax (3 + 0)
Examination of morphology and syntax of languages within a major Alaska Native language family. Directed at curriculum design or preparation of materials for Native language programs with attention to the variety of Native language situations in the state. Introduction to syntactic patterns and discourse analysis. May be repeated for credit only with change in topic. (Prerequisites: AL 300 or permission of instructor.)

A.L. 400 **3 Credits** **Fall**
Practicum (3 + 0)
The rationale and methodology for the observation, collection and analysis of data in applied linguistics; the use of appropriate equipment and resources; research and dissemination models; ethics in collection and dissemination. Students will complete individual, supervised projects in their areas of interest. (Prerequisites: AL 310; knowledge of language structure necessary.)

A.L. 450 **3 Credits** **Alternate Spring**
Policy and Planning for Alaska Native Languages (3 + 0)
Consideration of the future viability of Alaska Native languages in light of their histories and their current states. Analysis of the complex factors affecting language maintenance and the efficacy of maintenance and revitalization programs. The roles of communities, organizations, and institutions in policy planning both in Alaska and in other areas where Alaska Native languages are spoken, with perspectives from selected minority language situations in other countries. (Prerequisites: AL 310; a thorough knowledge of an Alaskan Native language is necessary to understand the kinds of impact non-linguistic factors may have on language structures and domains of use. Next offered: 1985-86.)

Applied Statistics

A.S. 301 **3 Credits** **Fall and Spring**
Elementary Probability and Statistics (2 + 3)
Descriptive statistics, frequency distributions, sampling distributions, elementary probability, estimation of population parameters, hypothesis testing (one and two sample problems), correlation, simple linear regression, and one-way analysis of variance. Parametric and nonparametric methods. (Prerequisites: Math 107 and junior standing or consent of instructor)

A.S. 351 **2 Credits** **Alternate Fall**
Statistical Computing Packages (1 + 3)
A study of the use of BMDP, SPSS, MINITAB, IMSL, and other miscellaneous statistical computing packages. Comparison of output for similar analyses. (Prerequisites: CS 201, AS 301. Next offered: 1985-86.)

A.S. 401 **4 Credits** **Fall**
Experimental Design and Regression (3 + 3)
A thorough study of multiple regression including multiple and partial correlation, the extra sum of square principle, indicator variables, and model selection techniques. Analysis of variance and covariance for multifactor studies in completely random, randomized complete block, and nested designs; multiple comparisons and orthogonal contrasts. (Prerequisite: A.S. 301)

A.S. 402 **3 Credits** **Fall**
Scientific Sampling (2 + 3)
Sampling methods, including simple random, stratified and systematic; estimation procedures, including ratio and regression methods; special area and point sampling procedures; optimum allocation. (Prerequisite: A.S. 301)

A.S. 431 **3 Credits** **Alternate Fall**
Applied Nonparametric Statistics (3 + 0)
The use and properties of nonparametric and distribution-free statistical methods. Procedures for one, two, and multiple sample problems, multiple comparisons, goodness-of-fit problems, contingency table analyses, and linear regression. General use of ranks in constructing tests of hypotheses. (Prerequisites: A.S. 301. Next offered: 1986-87.)

A.S. 451 **3 Credits** **Fall**
Statistics for Civil Engineering (3 + 0)
An introduction to the use of probability and statistics in civil engineering design. Probability theory, choice of frequency models, estimation, significance testing, introduction to Bayesian decision making. Application to civil engineering problems. (Prerequisites: M 302, junior standing in engineering or physical sciences)

A.S. 461 **3 Credits** **Alternate Spring**
Applied Multivariate Statistics (3 + 0)
A study of multivariate statistical methods of estimation and hypothesis testing, multivariate normality and its assessment, multivariate one and two sample tests, confidence regions, multivariate analysis of variance, discrimination and classification, principal components, factor analysis clustering techniques, and graphical presentation. Statistical computing packages utilized in assignments. (Prerequisites: A.S. 401 or consent of instructor. Next offered: 1985-86.)

A.S. 680 **4 Credits** **Alternate Fall**
Data Analysis in Biology (3 + 3)
(Same as Biol. 680)
Biological applications of nonparametric statistics, including tests based on binomial and Poisson distributions, analysis of two-way and multiway contingency tables, and tests bases on ranks; multivariate statistics, including principal component analysis, ordination techniques, cluster analysis, and discriminant analysis; and time-series analyses. Introduction to the use of the computer, computer programming, use of statistical packages, and plotting routines. Each student will analyze a data set appropriate to his or her research interests. (Prerequisites: A.S. 301, 302 and either graduate standing in a biologically oriented field or permission of instructor. Next offered: 1985-86.)

A.S. 602 - (left out)

Note: The following courses are statistical in orientation. A course description and listing of prerequisites may be found in the appropriate departmental course listings.

Anth. 421 — Analytical Techniques
B.A. 360 — Operations Management
B.A. 506 — Quantitative Analysis
B.A. 684 — Quantitative Methods for Management
Geos. 430 — Statistical and Data Analysis in Geology
Econ. 226 — Introduction to Statistics for Economics and Business
Econ. 227 — Statistical Methods
Econ. 626 — Econometrics
E.S.M. 621 — Operations Research
Math. 371 — Probability
Math 408 — Mathematical Statistics
Med. S. 630 — Epidemiology
Psy. 250 — Introduction to Statistics for Behavioral Sciences
Psy. 360 — Psychological Tests and Measurements
W.F. 630 — Quantitative Fisheries Science

Art

Art 105 3 Credits **Fall, Spring**
Beginning Drawing (1+4) h
Introduction to basic elements in drawing. Emphasis on a variety of techniques and media. Materials fee: $15.00.

Art 161 3 Credits **Fall, Spring**
Two-Dimensional Design (1+4) h
Fundamentals of form; principles of composition, organization, and structure.

Art 162 3 Credits **Fall, Spring**
Color and Design (1+4) h
Fundamentals of color and visual perception. Emphasis on two dimensions.

Art 163 3 Credits **Fall, Spring**
Three-Dimensional Design (1+4) h
Work in three dimensions in sheet metal, plaster, paper, wire, etc., using the principles and elements of design.

Art 201 3 Credits **Fall, Spring**
Beginning Ceramics (1+4) h
Introduction to the making and firing of clay objects. Study of clay methods of forming decorations, glazing, and firing. Foundation experiences in other materials such as plaster, enamels, concrete and glass. Materials fee: $25.00. (Prerequisites: Art 105 and Art 161 or 162 or 163, or permission of the instructor.)

Art 205 3 Credits **Fall, Spring**
Intermediate Drawing (1+4) h
Exploration of pictorial composition and creative interpretation of subjects. Materials fee: $15.00. (Prerequisite: Art 105.)

Art 207 3 Credits **Fall, Spring**
Beginning Printmaking (1+4) h
Introduction to the concepts and techniques of printmaking. Each semester concentration on working on some of the following:

Relief (collography, linocut, woodcut, wood engraving)
Intaglio (etching, engraving, drypoint, aquatint)
Serigraphy (silkscreen, stencil)
Lithography and various photographic techniques.

Materials fee: $25.00.

(Prerequisites: Art 105 and Art 161 or 162 or 163, or permission of the instructor.)

Art 209 3 Credits **Fall, Spring**
Beginning Metalsmithing (1+4) h
Introduction to the basic techniques of fine metalsmithing and jewelry. Materials fee: $25.00. (Prerequisites: Art 105 and Art 161 or 162 or 163, or permission of the instructor.)

Art 211 3 Credits **Fall, Spring**
Beginning Sculpture (1+4) h
An introduction to sculpture using wood, stone, metal, wire, plaster, etc. This course is designed to make the student artist aware of his materials and the tools required for the execution of sculpture. Materials fee: $25.00. (Prerequisites: Art 105 and Art 161 or 162 or 163, or permission of the instructor.)

Art 213 3 Credits **Fall, Spring**
Beginning Painting (Acrylic or Oil) (1+4) h
Investigation of basic materials and techniques in painting in the medium specified. (Prerequisites: Art 105 and Art 161 or 162 or 163, or permission of the instructor.)

Art 223 3 Credits **Every Third Spring**
Watercolor Painting (1+4) h
Painting in various transparent and opaque media (watercolor, tempra, polymer, casein). Emphasis on techniques and subjects. (Prerequisite: Art 105 and Art 161 or 162 or 163, or permission of the instructor. Next offered: 1984-85.)

Art 261 3 Credits **Fall**
Art 262 3 Credits **Spring**
History of World Art (3+0) h
Origins of art and its development from the beginning through contemporary painting, sculpture and architecture. Art 261-262 may be taken in reverse order; however, course content is presented in a chronological sequence beginning with fall semester. Term paper required each semester. (Prerequisite: Sophomore standing.)

Art 301 3 Credits **Fall, Spring**
Intermediate Ceramics (1+4) h
A continuation of basic ceramics with an emphasis on the potter's wheel, glaze calculations, and plaster as they relate to pottery. Materials fee: $25.00. (Prerequisites: Art 201 or permission of instructor.)

Art 305 3 Credits **Spring**
Advanced Drawing (1+4) h
Development and refinement of individual problems in drawing. Can be repeated for credit with permission of instructor. Materials fee: $15.00. (Prerequisites: Art 205 or permission of instructor.)

Art 307 3 Credits **Fall, Spring**
Intermediate Printmaking (1+4) h
A continuation of Art 207 with emphasis in refinement of technique, the use of color and printing. Materials fee: $25.00. (Prerequisite: Art 207, or permission of instructor.)

Art 309 3 Credits **Fall, Spring**
Intermediate Metalsmithing and Jewelry (1+4) h
Further investigation of material processes and techniques for metalsmithing and jewelry with some emphasis on design. Materials fee: $25.00. (Prerequisites: Art 209 or permission of instructor.)

Art 311 3 Credits **Fall, Spring**
Intermediate Sculpture (1+4) h
More advanced exploration of the sculptural idea; work on an individual basis with more advanced use of a variety of techniques and materials. Materials fee: $25.00. (Prerequisites: Art 211 or permission of instructor.)

Art 313 3 Credits Fall, Spring
Intermediate Painting (1+4) h
Continued development of expressive skills in painting in any media. Emphasis on pictoral and conceptual problems. Materials fee: $15.00. (Prerequisite: Art 213.)

Art 324 3 Credits Every Third Fall
Watercolor Painting and Composition (1+4) h
Development of individual approach to watercolor media. Can be repeated for credits with permission of the instructor. (Prerequisite: Art 223. Next offered: 1985-86.)

Art 363 3 Credits Alternate Spring
History of Modern Art (3+0) h
Development of modern art forms and theories in the visual arts from the late 19th century until contemporary art. Concentration on explaining the artistic pluralism of 20th century art forms: Cubism, Futurism, Surrealism, Expressionism, Constructivism, Non-objective Art, Abstract Expressionism, Pop Art, Realism and many other "ism." (Prerequisites: Art 262 or permission of instructor. Next offered: 1985-86.)

Art 364 3 Credits Alternate Spring
Italian Renaissance Art (3+0) h
The development of the Renaissance from early Florentine beginnings to the High Renaissance of Venice. Study of the works of such artists as Massacio, Michelangelo, DaVinci, Titian, etc. (Prerequisite: Art 261 or permission of instructor. Next offered: 1985-86.)

Art 365 3 Credits Fall
Native Art of Alaska (3+0) h
A study of art forms of the Eskimo, Indian, and Aleut ranging from prehistory to the present: emphasis upon the changes in forms through the centuries. (Prerequisites: Advanced standing or permission of instructor.)

Art 401 3 Credits Fall, Spring
Advanced Ceramics (1+4) h
Advanced wheel work; design of large scale ceramic murals for incorporation into architecture. Study of the practical application of ceramics in the commercial fields. Advanced body and glaze calculation. May be repeated for credit with permission of instructor. Materials fee: $25.00. (Prerequisites: Art 301 or permission of instructor.)

Art 407 3 Credits Fall, Spring
Advanced Printmaking (1+4) h
An individual development of technical and creative processes in printmaking: emphasis on experimentation and the use of the print workshop as a cooperative environment for the production of works of art. May be repeated for credit with permission of instructor. Materials fee: $25.00. (Prerequisites: Art 307, or permission of instructor.)

Art 409 3 Credits Fall, Spring
Advanced Metalsmithing and Jewelry (1+4) h
Continued investigation of materials and processes with an introduction to holloware skills and forging. May be repeated for credits with permission of instructor. Materials fee: $25.00. (Prerequisites: Art 309 or permission of instructor.)

Art 411 3 Credits Fall, Spring
Advanced Sculpture (1+4) h
Styrofoam burn-out, bronze casting, steel welding, repoussee sculpture, inlay, and architectural sculpture (stone and concrete). May be repeated for credit with permission of the instructor. Materials fee: $25.00. (Prerequisites: Art 311 or permission of instructor.)

Art 413 3 Credits Fall, Spring
Advanced Painting (1+4) h
Experimentation and development of individual ideas and techniques in painting. Can be repeated for credits with permission of instructor. Materials fee: $15.00. (Prerequisite: Art 313.)

Art 417 3 Credits Every Third Fall
Lithography (1+4) h
An exploration of stone and metal plate lithography: crayon, tusche and color work covered. Materials fee: $25.00. (Prerequisite: Art 105, 207, or permission of instructor. Next offered: Fall 1986.)

Art 419 3 Credits Fall, Spring
Life Drawing (1+4) h
Problems in drawing from life, exploring possibilities in pictorial design and composition. Emphasis on form in space using charcoal, pen, brush, and various other media. Materials fee: $15.00. (Prerequisite: Art 305 or permission of instructor. Next offered: 1984-85.)

Art 427 3 Credits Every Third Spring
Relief (1+4) h
Woodcut and other traditional relief methods explored in depth. Inks and ink properties are examined and used in the production of relief and monoprints. Color printing emphasized. Materials fee: $25.00. (Prerequisites: Art 105, 207, and 213, or permission of instructor. Next offered: 1986-87.)

Art 437 3 Credits Every Third Fall
Intaglio (1+4) h
Intaglio printmaking continued beyond the beginning level with an emphasis on experimentation and on the reproduction of images. Four color printing with emphasis on mezzotint, aquatint, soft ground and color registration. A color ink palette is devised with some emphasis on ink chemistry and physical properties. Materials fee: $25.00. (Prerequisites: Art 105, 162, 207, or permission of the instructor. Next offered: 1984-85.)

Art 441 3 Credits Every Third Spring
Lost Wax Casting (1+4) h
A study of the design and execution of jewelry and other small metal objects by the lost wax casting method. Materials fee: $25.00. (Prerequisite: Art 409 or permission of the instructor. Next offered: 1985-86.)

Art 442 3 Credits Every Third Spring
Nonferrous Forging (1+4) h
A study of the design and execution of hammer forged nonferrous metal objects. Materials fee: $25.00. (Prerequisite: Art 409 or permission of instructor. Next offered: 1986-87.)

Art 443 3 Credits Every Third Spring
Holloware (1+4) h
A study of the design and construction of holloware by raising, dapping, and fabricating. Materials fee: $25.00. (Prerequisite: Art 409 or permission of instructor. Next offered: 1984-85.)

Art 447 3 Credits Every Third Spring
Silkscreen (1+4) h
Silkscreen printing; Tusche and glue, torn paper stencil and photoscreen methods covered as well as discussion of the home workshop. Materials fee: $25.00. (Prerequisites: Art 105, 162, 207, or permission of the instructor. Next offered: 1984-85.)

Art 450 3 Credits Every Third Fall
Raku Pottery (1+4) h
A one semester experience in Raku pottery. Body and glaze development for raku purposes. Special emphasis on decorative techniques. Raku kiln building and burner construction employing a variety of fuels such as: wood, charcoal, electricity, natural gas, propane, oil, etc. Materials fee: $25.00. (Prerequisite: Art 201 or permission of instructor. Next offered: 1985-86.)

Art 451 3 Credits Every Third Spring
Earthenware (1+4) h
A one semester experience in earthenware pottery. Understanding the advantages and disadvantages of earthenware. Intensive laboratory activities in earthenware body and glaze development, decorative techniques and firing procedures. Materials fee: $25.00. (Prerequisite: Art 201 or permission of instructor. Next offered: 1985-86.)

Art 452 3 Credits Every Third Fall
Porcelain (1+4) h
A one semester experience in working with porcelain. Intensive laboratory experiences in developing a full complement of porcelain bodies (and glazes) suitable for hand building, throwing, casting, pressing, etc. Decorative techniques appropriate to this firing range as well as firing procedures associated with porcelain. Materials fee: $25.00. (Prerequisite: Art 201 or permission of instructor. Next offered: 1986-87.)

Art 453 3 Credits — Every Third Spring
Kiln Design and Construction (1 + 4) h
A one semester experience in kiln design and construction. After appropriate classroom instruction in understanding refractories, construction techniques and burners, the class will participate in constructing full size electric and fuel fired kilns. Materials fee: $25.00. (Prerequisite: Art 201 or permission of instructor. Next offered: 1986-87.)

Art 454 3 Credits — Every Third Fall
Vapor Glazing (1 + 4) h
Salt glazing (i.e., vapor glazing). Construction and maintenance of salt kilns. Development and use of clay bodies and decorative techniques peculiar to the salting phenomena, as well as the history and contemporary use of "salt" in pottery. Materials fee: $25.00. (Prerequisites: Art 201 and permission of instructor. Next offered: 1984-85.)

Art 455 3 Credits — Spring
Studio Glass (1 + 4) h
Studio participation in cold glass and hot glass techniques. Materials fee: $25.00. (Prerequisites: Advanced standing or permission of instructor.)

Art 499 1-3 Credits — Fall/Spring
Thesis Project
Thesis Project. Directed study towards a one person show or individual creative project in art. Work is done outside of the regularly scheduled classes. BFA degree candidates must complete a thesis project. (Prerequisites: Senior standing.)

Biology

Biol. 103 4 Credits — Spring
Biology and Man (3 + 3) n
Introduction to the fundamental principles of biology, with emphasis on their application to man in the modern world. The course is designed for non-science majors. Course includes lectures, laboratory demonstrations and experiments, and discussions of contemporary biological topics. This course may not be used as biology elective credit for a major in biological science. Laboratory fee: $5.00.

Biol. 104 3 Credits — Fall
Natural History of Alaska (3 + 0) n
Aspects of the physical environment peculiar to the north and important in determining the biological setting; major ecosystem concepts to develop an appreciation for land use and wildlife management problems in both terrestrial and aquatic situations. This course may not be used as biology elective credit for a major in biological science.

Biol. 105 4 Credits — Fall
Biol. 106 4 Credits — Spring
Fundamentals of Biology I and II (3 + 3) n
An introduction to the principles and basic observation of biology for the science major. Biological principles at levels ranging from molecular and subcellular to ecosystem will be treated through lecture, laboratory and discussion. Biol. 105 and 106 are prerequisite to further courses in the Biological Sciences. Biol. 105 is required for Biol. 106. Laboratory fee: $5.00.

Biol. 111 4 Credits — Fall
Biol. 112 4 Credits — Spring
Human Anatomy and Physiology I and II (3 + 3) n
An integrated view of human structure and function, specifically designed for students in nursing, physical and occupational therapy, physical education, and art. This semester will cover cells, tissues and organs, skeletal and muscle systems, the nervous system, and circulation. Biol. 112 is a continuation of Biol. 111, covering the structure and function of respiratory, digestive, excretory, endocrine, and reproductive systems. Biol. 111 is required for Biol. 112. These courses may not be used as biology elective credit for a major in biological science. Laboratory fee: $5.00.

Biol. 205 3 Credits — Alternate Spring
Vertebrate Anatomy (1 + 6) n Z
Anatomy of bony fishes, birds, and mammals. Laboratory dissections emphasized. Laboratory fee: $5.00. (Prerequisites: Biol. 105-106. Next offered: 1985-86.)

Biol. 210 4 Credits — Spring
Animal Physiology (3 + 3) n
Animal function, including respiration, digestion, circulation, nerve and muscle function, hormones, and reproduction. Laboratory fee: $5.00. (Prerequisites: Biol. 105-106; Chem. 103 and 104 or 105 may be taken concurrently.)

Biol. 222 4 Credits Z — Fall
Biology of the Vertebrates (3 + 3) n
An introduction to the fishes, amphibians, reptiles, birds, and mammals emphasizing systematics, structure, behavior and physiological features of each group. Laboratory fee: $5.00. (Prerequisites: Biol. 105-106.)

Biol. 239 4 Credits — Spring
Plant Form and Function (3 + 3) n B
Structure, function, ecology, and evolutionary patterns of the major groups of plants. Laboratory fee: $5.00. (Prerequisites: Biol. 105-106.)

Biol. 242 4 Credits — Spring
Introductory Microbiology (3 + 3) n M
A survey of morphology and physiology of microorganisms (viruses, bacteria, fungi, algae and protozoans). The role of these organisms in the environment and their relationship to man are considered. Concepts of immunology are introduced. The laboratory stresses aseptic techniques for handling microorganisms. Laboratory fee: $5.00. (Prerequisite: Biol. 105-106.)

Biol. 252 4 Credits — Fall
Principles of Genetics (3 + 3) n
Principles of inheritance; physico-chemical properties of genetic systems. Laboratory fee: $5.00. (Prerequisites: Biol. 105-106.)

Biol. 271 4 Credits — Fall
Principles of Ecology (4 + 0) n
Introduction to the basic principles of ecology and evolutionary biology. Environmental factors, their causation and influence upon plants and animals. Basic population biology: population structure, growth, and regulation. The mechanisms of evolutionary change in populations. The organization of biotic communities. The structure and function of ecosystems. (Prerequisites: Biol. 105 and 106.)

Biol. 305 4 Credits — Fall
Invertebrate Zoology (3 + 3) n Z
Classification, structure, function, evolution, and life histories of invertebrate animals. Laboratory fee: $5.00. (Prerequisites: Biol. 105-106, 210, and 271.)

Biol. 307 3 Credits — Fall
Parasitology (2 + 3) n Z
Structure, function, life history, and ecology of animal parasites. Laboratory fee: $5.00. (Prerequisites: Biol. 105-106 and Biol. 222 or permission of instructor.)

Biol. 308 3 Credits — Spring
Principles of Evolution (3 + 0) n
An introduction to the mechanisms of, and evidence for, the evolution of living systems. The coding and transmission of genetic information in populations, population variability, change, and stabilization. (Prerequisites: Biol. 105-106, 252, 271, or permission of the instructor.)

Biol. 317 5 Credits Z — Alternate Spring
Comparative Anatomy of Vertebrates (2 + 9) n
Anatomy, phylogeny, and evolution of the vertebrates. Laboratory fee: $5.00. (Prerequisites: Biol. 105-106. Next offered: 1984-85.)

Biol. 328 3 Credits — Spring
Biology of Marine Organisms (3 + 0) n Z
Introduction to biology of marine organisms: ocean as a habitat, distribution, classification, functional morphology, and general biology of the major biological groups; man and the oceans. (Prerequisite: Upper division standing in a biologically oriented major.)

Biol. 331 4 Credits — Spring
Systematic Botany (2 + 6) n B
Identification and classification of vascular plants with emphasis on Alaskan flora; discussion of taxonomic principles and both classical and experimental methods of taxonomic research. Preregistration is required to insure that each student will prepare a plant collection. Laboratory fee: $5.00. (Prerequisite: Biol. 239 or permission of the instructor. Biol. 252 recommended.)

Biol. 333 3 Credits B **Alternate Fall**
Biology of the Non-Vascular Plants (2+3) n
Comparative study of structure, development, phylogenetic trends, and life histories of the major groups of algae, fungi, and bryophytes. Laboratory fee: $5.00. (Prerequisite: Biol. 239. Next offered: 1985-86.)

Biol. 334 4 Credits B **Alternate Fall**
Morphology and Anatomy of Vascular Plants (3+3) n
Comparative study of morphology, development anatomy, phylogenetic trends, and life histories of the major groups of vascular plants. Laboratory fee: $5.00. (Prerequisite: Biol. 239. Next offered: 1986-87.)

Biol. 343 5 Credits **Alternate Fall**
General Bacteriology (3+6) n M
Morphology, physiology, and systematics of bacteria and viruses and their relationship to man. Introduction to microbial pathogenesis and concepts of immunology. The laboratory stresses bacterial isolation and identification as well as demonstration of the physiological properties of various known bacterial types. Laboratory fee: $5.00. (Prerequisites: Biol. 242, Chem. 321 or permission of instructor. Next offered: 1986-87.)

Biol. 352 3 Credits **Alternate Spring**
Cytogenetics (2+3) n
Chromosome form and function emphasizing gene structure, DNA replication, chromosomal mutation and population cytogenetics. Laboratory fee: $5.00. (Prerequisites: Biol. 252 or permission of instructor. Next offered: 1985-86.)

Biol. 361 4 Credits **Alternate Spring**
Cell Biology (3+3) n
Detailed structure, including ultrastructure, and function of the cell: isolation, composition, and biochemical properties of cell organelles and their integration. Laboratory fee: $5.00. (Prerequisites: A year each of college chemistry and biology. Next offered: 1986-87.)

Biol. 406 4 Credits **Spring**
Entomology (3+3) n Z
The biology and identification of insects and related arthropods, with emphasis on anatomy, physiology, behavior, ecology, and evolution. Laboratories emphasize techniques of collecting and preservation and identification. Laboratory fee: $5.00. (Prerequisites: Biol. 105-106 and 271.)

Biol. 414 4 Credits **Alternate Fall**
Comparative Physiology (3+3) n
Functional variations and interrelationships among the major animal phyla; includes ionic and osmotic regulation, temperature regulation, metabolism, excretion, respiration, cardiovascular systems, nerve, and muscle function. Laboratory fee: $5.00. (Prerequisites: Biol. 210, Chem. 106; Chem. 321 and Biol. 361 recommended. Next offered 1985-86.)

Biol. 416 3 Credits **Alternate Spring**
Plant Physiology (2+3) n
The physiology of vascular plants, including growth, development, water relations, photosynthesis, transport and metabolism. (Prerequisites: Biol. 239 and Chem. 106; Biol. 361 and Chem. 321 recommended. Next offered 1986-87.)

Biol. 418 4 Credits **Alternate Fall**
Developmental Biology (3+3) n
Chemical, histological, and morphological aspects of the development of organisms from gametes, using examples from plant and invertebrate development and vertebrate embryogenesis. Laboratories will stress the study of vertebrate embryos. Laboratory fee: $5.00. (Prerequisites: Biol. 105-106 and 210. Next offered: 1985-86.)

Biol. 423 4 Credits **Fall**
Ichthyology (3+3) n Z
Major groups of fishes, emphasizing the fishes of northwestern North America. Classification structure, evolution, general biology, and importance to man of the major groups. Laboratory fee: $5.00. (Prerequisites: Biol. 205, and either Biol. 222, or 317; or permission of the instructor.)

Biol. 425 3 Credits **Fall**
Mammalogy (2+3) n Z
Variety of mammals, their behavior, life histories, identification, phylogeny and systematics, morphology, distribution, and zoogeography. Laboratory fee: $5.00. (Prerequisites: Biol. 205, and either Biol. 222, or 317; or permission of instructor.)

Biol. 426 3 Credits Z **Spring**
Ornithology (2+3) n
The evolution, anatomy, physiology, distribution, migration, breeding biology, population dynamics and community organization of birds and their classification and identification. Laboratory fee: $5.00. (Prerequisites: Biol. 222, and either 205 or 317, or permission of instructor. Concurrent enrollment in Biol. 479 is recommended.)

Biol. 441 3 Credits Z **Spring**
Animal Behavior (2+3) n
Genetic and physiological bases of behavior, evolutionary and ecological principles of individual and social behavior, sociobiology, and the techniques of behavioral observation and analysis. Laboratory fee: $5.00. (Prerequisites: Biol. 210 and 271; or permission of instructor; Recommended: Biol. 308.)

Biol. 443 3 Credits M **Alternate Fall**
Microbial Ecology (2+3) n
Laboratory investigation of ecological activity and impact of bacteria and fungi. Isolation and study of important genera. Laboratory fee: $5.00. (Prerequisites: Biol. 242, 271 or 343; or permission of instructor. Next offered: 1985-86.)

Biol. 471 3 Credits **Spring**
Population Ecology (3+0) n
The biology of populations of plants and animals, including population structure, natality, mortality, population growth, the regulation of population size, and population interactions in herbivory, predation, and parasitism. (Prerequisite: Biol. 271.)

Biol. 472 3 Credits **Fall**
Communities and Ecosystems (3+0) n
An analysis of the structure of plant and animal communities and their organization. The structuring forces of competition, predation, herbivory, mutualisms, and the flow of energy and nutrients will be covered. Latitudinal gradients in species richness and biogeography will also be discussed. (Prerequisite: Biol. 271.)

Biol. 474 4 Credits **Alternate Fall**
Plant Ecology (3+3) n
Principles and contemporary topics in plant ecology. Topics covered include autecology, community ecology, ecosystem ecology and evolutionary ecology. (Prerequisites: Biol. 239 and 271. Next offered 1986-87.)

Biol. 478 2 Credits **Spring**
Field Ecology (0+3) n
An intensive experience in the collection and interpretation of ecological data. The course consists of concentrated study for 10-12 days in early May. Students will engage in the design, execution, and analysis of field projects dealing with various aspects of ecology. Course is graded pass/fail. Field trip fee to be announced. Laboratory fee: $5.00. (Prerequisites: Biol. 271, 471 or 472 [may be taken concurrently], and permission of instructor.)

Biol. 479 2 Credits **Spring**
Ornithology Field Trip (0+3) n
Techniques of field ornithology, emphasizing identification of birds in the field, and bird-habitat relationships. The course consists of advance preparation during the spring semester followed by a field trip of 10-12 days taken in early May. Students are expected to share in expenses. Field trip fee to be announced. Laboratory fee: $5.00. (Prerequisites: Biol. 426, may be taken concurrently, and permission of instructor.)

Biol. 610 3 Credits **Alternate Fall**
Regulation of Biological Processes (3+0)
A consideration of regulation of biological processes at levels of organization from the molecular to society and the ecosystem. The course will use animal, microbiol, and plant material and will consider control theory and its applications to biology. (Prerequisites: Graduate Standing and, in cases of highly qualified undergraduates, the instructor's permission. Next offered: 1985-86.)

Biol. 614 2 Credits Alternate Spring
Grazing Ecology (2+0)
(Same as WF 614)
A study of plant-animal interactions, emphasizing the grazing process, including mechanisms of feeding, feeding behavior, habitat and plant selection, and physiological influences on feeding. Other topics include the evolution and development of grazing systems, including plant and community level responses, anti-herbivore defenses of plants, and the role of grazing in ecosystem function; management and other human influences on grazing systems, including habitat alternation and loss, domestication, pollutants, and management alternatives. (Prerequisites: graduate standing or approval of instructor. Next offered: 1986-87.)

Biol. 616 3 Credits Alternate Spring
Principles and Methods of Taxonomy (2+3)
Philosophy and methodology relating to current trends in systematics, particularly morphometric and biochemical systematics. (Next offered: 1986-87.)

Biol. 618 2 Credits Alternate Spring
Biogeography (2+0)
Spatial and temporal geography of plant and animal groups; emphasis on environmental and historical features controlling present patterns of distribution. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1986-87.)

Biol. 619 2 Credits Alternate Fall
Marine Mammals (1+3)
Topics related to the biology of marine mammals will be considered including evolution, taxonomy, morphology, physiology, ecology, and behavior. (Prerequisites: Graduate standing or permission of instructor. Next offered: 1986-87.)

Biol. 624 3 Credits Alternate Fall
Physiological Ecology: Temperature Regulation and Thermal Adaptation (2+3)
A study of physiological processes involved in the interaction of organisms with their environment. Special emphasis will be placed on northern habitats. Temperature regulation and thermal adaptation will cover the effects of temperature upon organisms and the various ways organisms have responded to extreme thermal environments. Laboratory fee: $5.00. (Prerequisites: Graduate standing and a physiological course and Biol. 271 or permission of instructor. Next offered: 1986-87.)

Biol. 625 3 Credits Alternate Spring
Physiological Ecology: Energetics and Nutrition (2+3)
A study of physiological processes involved in the interaction of organisms with their environment, with special emphasis placed on northern habitats. Energetics and nutrition will cover the nutritional ecology of plants and animals and describe the adaptations of organisms to avoid or minimize nutritional imbalance or inadequacy. (Prerequisites: Graduate standing and a physiological course and Biol. 271 or permission of instructor. Next offered: 1986-87.)

Biol. 626 3 Credits Alternate Spring
Physiological Ecology: Sensory and Reproductive Physiological Ecology (2+3)
A study of the physiological processes involved in the interaction of organisms with their environment. Special emphasis will be placed on northern habitats. Sensory and reproductive physiological ecology will cover the physiology and ecology of reproduction, nervous and hormone systems, and circadian rhythms. (Prerequisites: Graduate standing and a physiological course and Biol. 271 or permission of instructor. Next offered: 1985-86.)

Biol. 629 3 Credits Alternate Fall
Advanced Animal Behavior (3+0)
Adaptive nature of behavior in relation to the physical, biological, and social environment. Current problems and controversies in the study of behavior. (Prerequisites: Biol. 441 and permission of the instructor. Next offered: 1986-87.)

Biol. 637 2 Credits Alternate Fall
Modern Evolutionary Theory (2+0)
Contemporary ideas of and problems with the mechanics of evolution. (Prerequisites: Graduate standing or permission of instructor. Next offered: 1985-86.)

Biol. 652 3 Credits Alternate Spring
Marine Ecology (3+0)
The sea as a biological environment, organisms in the ocean, factors influencing the growth of organisms, nutrient cycles, productivity, food web, and interdependence of organisms. Several field trips may be required. (Prerequisites: Biol. 271, Chem. 212, 322; Geol. 411 or permission of the instructor. Next offered: 1986-87.)

Biol. 674 3 Credits Alternate Fall
Advanced Plant Ecology (2+3)
Current concepts, controversies, and advances in plant ecology, emphasizing the physiological ecology, population biology, and community ecology of plants. (Prerequisite: Biol. 474 or the permission of the instructor. Next offered: 1987-88.)

Biol. 680 4 Credits Alternate Fall
Data Analysis in Biology (3+3)
(Same as A.S. 680)
Biological applications of nonparametric statistics, including tests based on binomial and Poisson distributions, analysis of two-way and multiway contingency tables, and tests based on ranks; multivariate statistics, including principal component analysis, ordination techniques, cluster analysis, and discriminant analysis; and time-series analyses. Introduction to the use of the computer, computer programming, use of statistical packages, and plotting routines. Each student will analyze a data set appropriate to his or her research interests. (Prerequisites: A.S. 301, 401 and either graduate standing in a biologically oriented field or permission of instructor. Next offered: 1985-86.)

Business Administration

Admittance to upper division School of Management courses will be granted only to students with junior standing or above. Others will be admitted only with the written permission of the appropriate department head.

B.A. 100 3 Credits (old 101) **Fall and Spring**
Introduction to Data Processing and BASIC Language (3+0)
A general introductory business course designed to provide students with an overview of business applications of computers. Topics covered are: machine organizations, problem formulation, utilization of BASIC programming language in business applications, information flow management, applications of automatic data processing systems to include input-output procedures, and the utilization of business application programs available to the School of Management. Materials fee: $20.00. (Not for School of Management students. This course will not substitute for B.A. 101, Introduction to Management Information systems.)

B.A. 101 3 Credits Fall and Spring
Introduction to Management Information Systems (3+0)
An introduction to the concepts, skills and software required for today's business education. Students will become familiar with selected current business software applications. Special emphasis will be placed on acquiring proficiency in the use of required School of Management software programs. Mateirals fee: $20.00.

B.A. 151 3 Credits Fall and Spring
Introduction to Business (3+0)
Business organization, nature of major business functions such as management, finance, accounting, marketing, personnel administration. The opportunities and requirements for professional business careers.

B.A. 160 3 Credits Fall
Tourism Principles and Practices (3+0)
Forces which influence the international and domestic hospitality, leisure, travel, and recreation industries. Socio-economic models and measure of regional impact, demand, and supply.

B.A. 201 3 Credits Alternate Spring
COBOL (2+2)
Training and practice in writing problems in the COBOL language. Multiple file processing, editing, and report generating routines. (Prerequisite: B.A. 101 or permission of instructor. Next offered: 1985-86.)

B.A. 220 3 Credits Alternate Fall
Basic Programming Languages (3 + 0)
Programming in selected computer languages including ASSEMBLER, RPG, and machine language. (Prerequisite: B.A. 101. Next offered: 1985-86.)

B.A. 253 1-3 Credits Fall-Spring-Summer
Internship in Business (0 + 1-3)
Supervised work experience in an approved position which is related to the student's career interests or objectives. Number of credits given will depend on types of position and amount of time worked by the student. No student can count more than eight internship credits towards a degree. (Prerequisite; approval of program or department head.)

B.A. 301 3 Credits Fall and Spring
Processes of Management (3 + 0)
A systematic examination of the basic functions of management with particular attention on the human side of the organization. Modes of communication and coordination are evaluated in terms of the need for planning, controlling, and decision-making among the organizational components. An overall framework for effective integration of the distinct processes is emphasized. (Prerequisites: Junior standing or permission of instructor.)

B.A. 303 3 Credits Fall
Advanced Leadership (3 + 1)
(Same as Mil. 303)
Comprehensive analysis of leadership styles and functions applicable to formal organizations. Lab: Advanced leadership development including enrichment seminars. (Prerequisite: Junior standing.)

B.A. 306 3 Credits Spring
Small Business Management (3 + 0)
The course focuses on the operations and special problems of the small business with emphasis on both existing firms and new ventures. Subjects to be covered include starting new businesses, buying going concerns, acquiring and operating franchises, establishing lines of credit, management, legal matters, profit planning, pricing, inventory levels, record systems, tax regulations, and employee supervision.

B.A. 310 3 Credits Fall and Spring
Intermediate Management Information Systems (3 + 0)
The use of the micro computer for developing and using decision support systems for management analysis in business is emphasized. Concepts and skills acquired in this course are needed for other upper division business courses. Materials fee: $20.00. (Prerequisite: B.A. 101.)

B.A. 325 3 Credits Fall and Spring
Financial Management (3 + 0)
Intensive analysis of the methods of corporate financial planning and control, asset management, capital budgeting, and financial markets and instruments. (Prerequisites: Acct. 102, Econ. 201, 202, 226. Highly recommended Math 162 or equivalent. And Econ. 227.)

B.A. 326 3 Credits Spring
Principles of Advertising (3 + 0)
(Same as J-B 326)
Theory and practice of advertising: including strategy, media use, creation and production of advertisements, and measurement of advertising effectiveness. (Prerequisite: Junior standing.)

B.A. 331 3 Credits Fall and Spring
Business and Law (3 + 0)
An introduction to the legal environment of business and management. Topics include the judicial system, legal processes, administrative processes, torts and criminal law, contracts and remedies, sales, property, and government regulation. (Prerequisite: Junior standing or permission of instructor.)

B.A. 332 3 Credits Fall and Spring
Advanced Topics in Business and Law (3 + 0)
Selected topics in the legal aspects of business. Topics include insurance, agency, employment, labor-management relations, business structures, securities, securities regulation, credit and banking, consumer protection, and trade regulation. (Prerequisite: B.A. 331.)

B.A. 343 3 Credits Fall and Spring
Principles of Marketing (3 + 0)
Role of marketing in society and economy. The business firm as a marketing system, and management of the firm's marketing effort. (Prerequisite: Acct. 102, Econ. 201, 202, 226.)

B.A. 349 3 Credits Spring
Sales Management (3 + 0)
Examine managerial strategies, goals, and analytical tools in the administration of an effective sales force with primary focus on professional salesmanship and sales management. (Prerequisites: B.A. 343.)

B.A. 350 3 Credits Spring
Introduction to Real Estate and Land Economics (3 + 0)
Study of processes and considerations that influence decisions of individuals and groups concerning real estate investment and utilization. Functions of various types of real estate operators are also considered in the course. (Prerequisites: Junior standing or permission of instructor.)

B.A. 356 2 Credits Alternate Spring
Beverage Production Preparation and Control (2 + 0)
The importance of beverage function in today's hospitality operations. The production, preparation, service, and control of beverages will be systematically presented. (Next offered: 1986-87.)

B.A. 360 3 Credits Spring and Fall
Operations Management (3 + 0)
An introduction to the operational field of production with emphasis on the design of efficient operating systems. Specific areas considered are: forecasting, facilities planning, inventory management, production scheduling, and job design as applicable to all types of organizations. Materials fee: $20.00. (Prerequisites: B.A. 101 or equivalent, Acct. 102, Econ. 201, 202, 226. Highly recommended, Math. 162 or equivalent and Econ. 227.)

B.A. 361 3 Credits Fall
Personnel Management (3 + 0)
Personnel practice in industry, analysis of labor-management problems, methods and administration of recruiting, selecting, training, and compensating employees, and labor laws and their applications. Materials fee: $10.00 (Prerequisites: B.A. 301 or permission of instructor.)

B.A. 372 3 Credits Spring
Hotel Administration (3 + 0)
An intensive examination of the practices and concepts necessary for successful hotel operation in Alaska including but not limited to management systems financing of hotels, budgeting and food costing, housekeeping, and front office management. (Prerequisites: B.A. 160, B.A. 253 and B.A. 301.)

B.A. 375 3 Credits Spring
Marketing of Hospitality Service (3 + 0)
Principles of marketing applied to service industries, advertising, promotion, public relations, and personal selling to achieve profitable public recognition and good will. (Prerequisites: B.A. 343.)

B.A. 377 3 Credits Alternate Fall
Food and Beverage Management (3 + 0)
Students will follow the development of a successful food and beverage system from its inception to operation and will deal with the diverse subjects of menu planning, purchasing, preparation, service, and food beverage cost control. (Prerequisites: B.A. 160, B.A. 253, B.A. 301. Next offered: 1986-87.)

B.A. 378 3 Credits Fall
Passenger Transportation Management (3 + 0)
Students will become familiar with all modern forms of passenger transportation. Main emphasis will be put on those carriers presently operating in Alaska and future development of transportation in Alaska. (Prerequisites: B.A. 160 and B.A. 253.)

B.A. 390 3 Credits Fall
Organizational Behavior (3 + 0)
A study of the behavior of individuals and small groups within organizations, including motivation, leadership, communications, group dynamics, organizational development, and conflict management. (Prerequisites: Psy. 101 or Soc. 101.)

B.A. 423 3 Credits Fall
Investment Management (3 + 0)
Principles of investing in marketable securities from the individual's perspective, the determination of value, analysis of growth, technical analysis, and portfolio management. Materials fee: $20.00. (Prerequisite: B.A. 325 or equivalent.)

B.A. 425 3 Credits Spring
Advanced Corporate Financial Problems (3 + 0)
A consideration of corporate financial problems, planning and controls, and major functions performed by corporate financial managers. (Prerequisite: B.A. 325.)

B.A. 430 3 Credits Fall
Current Topics in Finance (3 + 0)
An in-depth consideration of sophisticated and specialized applications of financial management principles. The topics covered will be those most timely to the Alaskan economy. (Prerequisites: B.A. 445.)

B.A. 436 3 Credits Spring
Consumer Behavior (3 + 0)
Examination of the complex system of communication in marketing. The role of culture and its effects on product discrimination. Social class, personality, symbolism, and persuasion are studied from the marketing manager's point of view. The analysis is extended to the organizational influences on corporate buyers and the impact of buyer behavior on the strategy and tactics of marketing management. (Prerequisites: B.A. 343.)

B.A. 443 3 Credits Spring
International Marketing (3 + 0)
There are significant changes occurring in the world with respect to trade. Thus, comparisons of foreign markets with domestic markets are required. If the market is attractive, then it can be enlarged via direct export, direct investment, or joint ventures. All three methods will be examined. The problems of foreign pricing, communications, distribution, and advertising will also be viewed in terms of marketing management and research. (Prerequisite: B.A. 343.)

B.A. 445 3 Credits Spring
Marketing Research (3 + 0)
To familiarize students with the basic processes and tools of marketing research with emphasis on utilization of research findings as an integral part of the managerial decision-making process. Students will apply technique of data-gathering and analysis to a marketing problem. (Prerequisites: Econ 227, Math 162 or equivalent and B.A. 343.)

B.A. 453 3 Credits Fall and Spring
Internship in Business Administration (0 + var.)
A supervised practical work experience designed to provide students with a meaningful external involvement in their major discipline. Admission dependent upon completion of satisfactory sponsorship arrangements and permission of the instructor. (Prerequisite: Senior standing and permission of instructor.)

B.A. 460 3 Credits Fall
International Business (3 + 0)
An analysis of the relationships among nations with particular emphasis on the business, economic, and sociocultural institutions that influence the performance of managers. Formulation of objectives, strategies, and organizational structures within the context of international diversity will be addressed. (Prerequisite: B.A. 301.)

B.A. 461 3 Credits Spring
International Finance (3 + 0)
A study of the financing of foreign investment projects including foreign capital markets, financing exports, hedging foreign exchange risks, and capital budgeting in an international setting. (Prerequisites: B.A. 325.)

B.A. 462 3 Credits Fall and Spring
Administrative Policy (3 + 0)
An advanced case course which focuses on the questions of organizational purpose and design through the eyes of the general manager. Marketing, management, and financial considerations are integrated with external influences to forge strategic planning and control. (Prerequisites: Completion of all 300 level common body of knowledge requirements and senior standing.)

B.A. 465 3 Credits Alternate Spring
Tourism Destination Planning and Development (3 + 0)
Tourism resource characteristics, location, and market demand considerations. Analysis of development potential, planning processes and procedures, capital and personnel requirements, and tourism destination developments. (Prerequisites: B.A. 160, B.A. 301. Next offered: 1985-86.)

B.A. 471 3 Credits Alternate Spring
Tourism Seminar (3 + 0)
A senior seminar bringing together all areas of the travel-tourism industry. Lecturer, guest industry speakers, and the case study method will all be utilized. (Prerequisite: Admission by instructor's permission and upper division standing. Next offered: 1986-87.)

B.A. 475 3 Credits Spring
Transportation and Logistics (3 + 0)
The essential focus of teaching and research in transportation is on systems planning, especially multimode systems. The program builds upon basic knowledge of the properties of transportation systems components, and the ability to analyze interactions among these components and between the transportation system and its environment. Special consideration will be given to Alaskan transportation problems by experienced specialists. (Prerequisites: Econ. 226, B.A. 343.)

B.A. 480 3 Credits Spring
Organization Theory (3 + 0)
A review of the literature on organization theory, emphasizing theoretical concepts, social science research techniques, and organizational behavior. Development and study of the various approaches to organizational change including the initiation of change and the evaluation of change programs. (Prerequisites: B.A. 301 or permission of instructor.)

B.A. 483 3 Credits Fall
Marketing Management (3 + 0)
Analysis planning and implementation of the total marketing program of an organization: goal setting, marketing mix, problem recognition and analysis, and current issues. (Prerequisite: B.A. 343.)

B.A. 503 3 Credits Fall
Management Practices (3 + 0)
A graduate level introduction to issues in management which focuses on the essentials of effective management for the practicing manager. A critical look at current operating management theory including planning, managing, staffing, and leadership skills. Materials fee: $20.00. (Prerequisite: Graduate standing.)

B.A. 505 3 Credits Fall
Management Information Systems (3 + 0)
Application of systems concepts for producing information to be used in business decision making. Computer hardware and BASIC and COBOL programming languages. Design of computer-based decision systems. Materials fee: $20.00. (Prerequisite: Graduate standing.)

B.A. 506 3 Credits Spring
Quantitative Analysis (3 + 0)
An introductory study of the quantitative methods, tools, and statistics applicable to the solution of business and economic problems. Concepts, techniques, and statistical analysis, including probability, statistical inference and analysis of variance, and correlation and regression analysis. (Prerequisites: Graduate standing and Math 161-162 or equivalent.)

B.A. 525 3 Credits Spring
Financial Management (3 + 0)
A broad based introduction to the theories and techniques of corporate financial management. Topics covered include capital budgeting, cost of capital, leverage and valuation. (Prerequisites: Graduate standing, Econ. 501, B.A. 502, B.A. 505.)

B.A. 543 3 Credits Fall
Marketing Management (3 + 0)
An introductory graduate level course in marketing including the study of product and product planning, research, distribution channels, logistics, consumer behavior, pricing, sales promotion and management, and the institutional structure of markets. (Prerequisites: Graduate standing, Econ. 501.)

B.A. 580 3 Credits Spring
Organizational Theory (3 + 0)
The structure and design of modern organizations, including the critical review of topics such as organization functions, design parameters, contingency factors, and structural configurations. (Prerequisites: Graduate standing, B.A. 503.)

B.A. 651 3 Credits Fall
Organizational Behavior (3+0)
A study of the behavior of individuals and small groups within organizations including the following concepts: personality, perception learning, motivation, group attraction and formation, group processes, conflict, and leadership. (Prerequisites: Graduate standing in M.B.A. Program or B.A. 503.)

B.A. 661 3 Credits Spring
Human Resources Management (3+0)
The study of the effective management of human resources in organizations including employee planning, employee attraction, selection and orientation, career development, evaluation, training, compensation, EEO, safety, and labor relations. (Prerequisites: Graduate standing, B.A. 580, B.A. 651.)

B.A. 680 3 Credits Fall
Seminar in Finance (3+0)
A study of the finance function of the firm and the major problems faced by the financial managers, including capital investment analysis and valuation, capital budgeting, financial structure and dividend policies, working capital management, and other current topics in financial management. (Prerequisites: Graduate standing. Completion of foundation core courses. B.A. 325 or B.A. 525.)

B.A. 683 3 Credits Spring
Seminar in Marketing (3+0)
A survey of marketing institutions, systems, policies, and practices. Review of marketing constituents in economic development, marketing theory, and current problems. (Prerequisites: Graduate standing. Completion of foundation core courses. B.A. 343 or B.A. 543.)

B.A. 684 3 Credits Fall
Production and Operations Management (3+0)
A study of the technical management skills needed to effectively manage the activities of selecting, designing, operating, controlling, and updating the productive and operating systems in diverse types of organizations, ranging from manufacturing to service. Materials fee: $20.00. (Prerequisite: Graduate standing in M.B.A. Program.)

B.A. 690 3 Credits Spring
Administrative Policy (3+0)
The broad aspects of administrative policy and the major social, political, legal, economic, and international forces impacting on complex organizations. Development of an intuitive systematic scientific understanding of the design and use of formal systems for comprehensive long-range planning and policy formulation in large corporations. (Prerequisites: Graduate standing. Completion of foundation core courses. Recommended that B.A. 690 be taken last semester of program.)

B.A. 691 3 Credits Fall
Research Design and Methods (3+0)
Emphasis on the general applications of the methods of business research and the scientific method of research in business administration. Topics to be considered include the planning of a research project and problem identification, scientific methods in business administration, research design and models, library, survey, and experimental research methods. The course is designed to aid the MBA student in identifying and specifying research problems prior to involvement in the preparation of the research project. Materials fee: $20.00. (Prerequisite: Graduate standing in MBA Program.)

Chemistry

Chem. 103 4 Credits Fall
Chem. 104 4 Credits Spring
Contemporary Chemistry (3+3) n
Descriptive courses with laboratory designed to provide orientation in chemistry for students in non-science and science related curricula. Either semester may be taken separately without prerequisites: Chem. 103: Introductory principles of inorganic chemistry and their applications. Chem. 104: Principles and applications of the chemistry of carbon in a modern economic, social and biological context.

Chem. 105 4 Credits Fall and Spring
Chem. 106 4 Credits Fall and Spring
General Chemistry (3+3) n
An introduction to chemistry, including atomic and molecular structure, the principles of chemical change, and related energy changes. Chemistry 106 includes the chemistry of the elements. (Prerequisites: High school algebra and high school chemistry or permission of the instructor. For Chem. 106, Chem. 105 is required.)

Chem. 120 4 Credits Fall
Survey of Chemistry (3+3) n
A one semester survey of general chemistry beginning with fundamental concepts and laws and applying them to inorganic and organic chemistry. Applications are done in such a way as to prepare the student to study the chemistry of biological systems. This course is preparatory for Chem. 121, Beginnings in Biochemistry. (Prerequisites: High school chemistry or consent of instructor.)

Chem. 121 4 Credits Spring
Beginnings in Biochemistry (4+0) n
A freshman-level course covering the fundamentals of chemistry as applied to biological systems. It is intended to bridge the gap between a general chemistry course and the biochemical concepts of other health-related sciences. Recommended for health-science degree candidates. (Prerequisite: Chem. 120 or consent of instructor.)

Chem. 212 4 Credits Fall
Introductory Quantitative Analysis (2+6) n
The theoretical treatment of statistics, electro-chemistry, and spectroscopic methods. A rigorous treatment of acid-base, oxidation-reduction, and complex equilibria. The laboratory includes practice in volumetric, gravimetric, spectroscopic, and electrochemical methods. (Prerequisites: Chem. 106, Math 107-108 or equivalent.)

Chem. 321 3 Credits Fall and Spring
Chem. 322 3 Credits Spring
Organic Chemistry (3+0) n
A systematic study of the more important classes of carbon compounds, reactions of their functional groups, methods of synthesis, relations, and uses. (Prerequisite, Chem. 106 or 211 for Chem. 321; Chem. 321 for Chem. 322.)

Chem. 324 3 Credits Fall and Spring
Organic Laboratory (1+8) n
A laboratory designed to illustrate modern techniques of isolation, purification, analysis, and structure determination of covalent, principally organic, compounds. (Prerequisites: Chem. 321 or permission of the instructor.)

Chem. 331 3 Credits Fall
Chem. 332 3 Credits Spring
Physical Chemistry (3+0) n
Fall semester; kinetic theory of gases, principles of thermodynamics, with applications to solutions, phase equilibria and chemical equilibria. Spring semester, chemical kinetics, electrochemistry, atomic, and molecular structure. (Prerequisites, Chem. 106 or 211, Math. 202, Phys. 104 or 212 or permission of the instructor; Chem. 331 for Chem. 332.)

Chem. 402 3 Credits Alternate Spring
Inorganic Chemistry (3+0) n
Systematic application of the theories of atomic structure and chemical bonding to the elements as they appear in the Periodic System. (Prerequisite or corequisite: Chem. 332. Next offered: 1986-87.)

Chem. 421 3 Credits As Demand Warrants
Advanced Organic Chemistry (3+0) n
The design and reactivity of organic molecules, variable content. (Prerequisites: Chem. 322, 331 or permission of instructor.)

Chem. 431 3 Credits Fall
Advanced Physical Chemistry (3+0) n
Introduction to quantum chemistry. (Prerequisite: Chem. 332.)

Chem. 433 3 Credits Fall
Chem. 434 3 Credits Spring
Instrumental Methods in Chemistry (1+6) n
The application of instrumental methods to quantitative, qualitative, and structural analysis of chemical systems. (Prerequisite: Chem 212; or Corequisites: Chem. 331 for Chem. 433; Chem. 332 for Chem. 434.)

Chem. 451 4 Credits Fall
General Biochemistry (4+0) n
Chemistry of bio-molecules; enzyme mechanisms and kinetics, aspects of bioenergetics, and catabolic and anabolic pathways. (Prerequisites: Chem. 322; Chem. 331 and 332 recommended or permission of the instructor.)

Chem. 602 3 Credits As Demand Warrants
Advanced Inorganic Chemistry (3+0)
Advanced topics in inorganic chemistry. Topic Areas: solid state chemistry, bioinorganic chemistry, X-ray diffraction, thermodynamic aspects, physical methods, unusual oxidation states, etc. (Prerequisite: Chem. 402 or 431.)

Chem. 612 3 Credits Alternate Fall
Advanced Analytical Chemistry (3+0)
Advanced topics in analytical chemistry. Content varies, but emphasis is on chemical equilibria and modern instrumental technique. (Prerequisite: Chem. 332. Next offered: 1985-86.)

Chem. 622 3 Credits As Demand Warrants
Advanced Organic Chemistry II (3+0)
Modern interpretations of organic chemical reactions based on structure, kinetics, and energetics. Variable content. (Prerequisites: Chem. 322 and 332.)

Chem. 632 3 Credits As Demand Warrants
Advanced Physical Chemistry II (3+0)
Applications of quantum mechanics to molecular bonding and electronic spectroscopy. (Prerequisite: Chem. 431.)

Chem. 652 3 Credits Alternate Springs
Advanced Biochemistry (3+0)
Current research in one of the major biochemical disciplines: proteins, lipids, carbohydrates; biochemical genetics; comparative biochemistry; enzymology; physical biochemistry; vitamins and hormones. Variable content. Arranged in consultation with instructor. (Prerequisites: Chem. 451 or equivalent. Next offered: 1985-86.)

Chem. 660 3 Credits Spring
Chemical Oceanography (3+0)
(Same as OCN 660)
An integrated study of the chemical, biological, and physical processes that determine the distribution of chemical variables in the sea. The distribution of stable and radio-isotopes are used to follow complex chemical cycles, with particular emphasis on the cycles of nutrient elements. The chemistry of carbon is considered in detail. The implications of the recently explored mid-ocean ridge vent system to ocean chemistry are examined. (Prerequisites: Graduate standing or permission of instructor.)

Civil Engineering

C.E. 112 3 Credits Spring
Elementary Surveying (2+3)
Basic plane surveying; chaining; use of transit, level, theodolite, and plane table. Stadia, public land system, circular curves, and traverses. (Prerequisites: E.S. 111 or permission of the instructor.)

C.E. 334 3 Credits Spring
Properties of Materials (2+3)
Introduction to the properties of engineering materials. Bonding, crystal, and amorphous structures. Relationships between microstructure and engineering properties. Modification of properties and environmental serviceability. Concrete and asphalt mixes. (Prerequisite: College Chemistry.)

C.E. 344 3 Credits Spring
Water Resources Engineering (3+0)
Fundamentals of engineering hydrology and hydraulic engineering. Precipitation, runoff, statistical methods, flood control, open channels, and groundwater. (Prerequisite: E.S. 341.)

C.E. 402 3 Credits Fall
Transportation Engineering (2+3)
Administration, economics, location, design, construction, and maintenance of highways, railways, airports, and other transportation facilities. (Prerequisite: C.E. 415 or permission of the instructor.)

C.E. 412 3 Credits Alternate Spring
Elements of Photogrammetry (2+3)
Elementary study of aerial and terrestrial photographs as applied to surveying and mapping. (Prerequisite: permission of the instructor. Next offered: 1985-86.)

C.E. 415 3 Credits Fall
Advanced Surveying (2+3)
Azimuth by astronomic methods. Route surveying, including horizontal and vertical curves, cross-sectioning, and earthwork. Reduction of electronic distance measurements. Alaska State Plane Coordinate System. (Prerequisite: C.E. 112)

C.E. 416 1 Credit Spring
Boundary Surveying (1+0)
Surveying problems related to land subdivision with emphasis on the legal aspects. Both metes and bounds descriptions and platted subdivisions are considered. (Prerequisite: C.E. 112 or permission of the instructor.)

C.E. 422 3 Credits Spring
Foundation Engineering (3+0)
Principles of foundation design, ultimate bearing capacity of soils and effects of settlements on structure, design of footings and rafts, design of pile and pier foundations, retaining walls and anchored bulkheads, foundations on frozen soils, and construction problems in foundation engineering. (Prerequisite, C.E. 435.)

C.E. 431 4 Credits Fall
Structural Analysis (3+3)
Statistically determinate structures. Loadings. Graphical and analytical solutions, stresses and deflections. Indeterminate structures. Influence lines. Matrix Formulation. (Prerequisite: E.S. 331.)

C.E. 432 4 Credits Spring
Structural Design (3+3)
Planning of structural systems. Loadings. Steel and reinforced concrete design. Composite design. Details and connections. (Prerequisite: C.E. 431.)

C.E. 434 1 Credit Spring
Timber Design (1+0)
Essentials of structural design in timber. Design of basic components of solid and laminated timber, connections, arches, pole framing, diaphragms, stressed-skin construction, and timber shells. (Prerequisite: E.S. 331.)

C.E. 435 3 Credits Fall
Soil Mechanics (2+3)
Soil formation, identification and classification, physical and mechanical properties of soil, seepage, drainage and frost action, subsoil investigation, bearing capacity of soils, and lateral earth pressures and stability of slopes. (Prerequisite: E.S. 331, C.E. 334.)

C.E. 438 3 Credits Spring
Design of Engineered Systems (3+0)
Introduction to system design methods for large scale engineering systems. The application linear and dynamic programming and statistical methods to design decisions. Emphasis on problems in civil engineering. (Prerequisite: Senior standing in an engineering program.)

C.E. 441 4 Credits Fall
Environmental Engineering (3+3)
Introduction to fundamentals of environmental engineering including theory and application of water and wastewater engineering practice. Conservation, quality, treatment, and distribution of water supply. Wastewater characteristics, collection, treatment, and disposal. Introductory information on solid waste management and air pollution control. (Prerequisite: E.S. 341 or permission of instructor.)

C.E. 470 1 Credit Fall and Spring
Civil Engineering Internship (0+3)
Designed to give students the opportunity to investigate the practical workings of engineering organizations. Assignments individually arranged with cooperating organizations and agencies. (Prerequisites: Senior standing. Permission of Department Coordinator.)

C.E. 603 3 Credits Fall and Spring
Arctic Engineering (3 + 0)
Application of engineering fundamentals to problems of advancing civilization to polar regions. Logistics, foundations on frozen ground and ice thermal aspects of structures, materials, transport, and communications, and heating and ventilating. (Prerequisite: Graduate standing or permission of instructor.)

C.E. 617 3 Credits Alternate Fall
Control Surveys (3 + 0)
Geodetic surveying, where the shape of the earth must be considered. Both horizontal and vertical control will be studied. Heavy emphasis on Alaska State Plane Coordinate System. Adjustments of level nets, traverses, triangulation, and trilateration. (Prerequisite, C.E. 415 or other surveying experience acceptable to the instructor. Next offered: 1985-86.)

C.E. 620 3 Credits Alternate Spring
Civil Engineering Construction (3 + 0)
Construction equipment, methods, planning and scheduling, construction contracts, management and accounting, construction estimates, costs, and project control. (Prerequisites: ESM 450 or equivalent. Next offered: 1986-87.)

C.E. 631 3 Credits As Demand Warrants
Advanced Structural Analysis (3 + 0)
Continuation of C.E. 431. Continuity in structure. Elastic and plastic theories. Arches and shells. Tall frames. (Prerequisite: C.E. 431.)

C.E. 632 3 Credits Alternate Fall
Advanced Structural Design (3 + 0)
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. 431. Next offered: 1986-87.)

C.E. 661 3 Credits As Demand Warrants
Advanced Water Resources Engineering (3 + 0)
Engineering hydraulics and hydrology with emphasis on statewide topics, computer modeling for runoff and groundwater studies, reservoir mechanics, fish hatchery design, and hydro-power generation. (Prerequisite: Permission of the instructor.)

C.E. 662 3 Credits Alternate Spring
Open Channel and River Engineering (3 + 0)
Principles of open channel flow, transitions and controls, unsteady flow, river engineering, stream channel mechanics, and mechanics of sedimentation. (Prerequisite: E.S. 341. Next offered: 1985-86.)

C.E. 663 3 Credits Alternate Years
Groundwater Dynamics (3 + 0)
Fundamentals of geohydrology, hydraulics of flow through porous media, well hydraulics, groundwater pollution, and groundwater resources development. (Prerequisite: E.S. 341. Next offered: 1986-87.)

C.E. 676 3 Credits As Demand Warrants
Coastal Engineering (3 + 0)
Review of deep and shallow water waves, littoral drift, coastal structures, pollution problems, and harbor seiches. (Prerequisite: E.S. 341.)

C.E. 681 3 Credits Alternate Spring
Frozen Ground Engineering (3 + 0)
Nature of frozen ground, thermal properties of frozen soils, classification, physical and mechanical properties of frozen soils, sub-surface investigation of frozen ground, thaw settlement and thaw consolidation, slope stability, and principles of foundation design in frozen ground. (Prerequisite: Training or experience in soil mechanics. Next offered: 1985-86.)

C.E. 682 3 Credits Alternate Spring
Ice Engineering (3 + 0)
In this course, the factors governing design of marine structures, which must contend with the presence of ice are discussed. Topics include ice growth, ice structure, mechanical properties and their dependence on temperature and structure, creep and fracture, mechanics of ice sheets, forces on structures, and experimental methods. (Prerequisite: E.S. 331, Math 202, training or experience in soil mechanics. Next offered: 1985-86.)

C.E. 683 3 Credits Alternate Years
Arctic Hydrology and Hydraulic Engineering (3 + 0)
The course is designed to present material on aspects of hydrology and hydraulics unique to engineering problems of the north. Although the emphasis will be on Alaskan conditions, information from Canada and other circum-polar countries will be included in the course. (Prerequisite: C.E. 344 or equivalent. Next offered: 1985-86.)

C.E. 684 3 Credits Alternate Years
Arctic Utility Distribution (3 + 0)
Practices and considerations of utility distribution in Arctic regions. Emphasis on proper design to include freeze protection, materials, energy conservation, and system selection. (Prerequisite, E.S. 341 or permission of instructor. Next offered: 1986-87.)

College Student Personnel Administration

CSP. 651 3 Credits Alternate Fall
Current Issues in Student Personnel Administration (3 + 0)
The contemporary problems and issues affecting student personnel workers in higher education. Includes an examination of the changing roles of students, student diversity, students' rights, freedoms, and responsibilities; evaluation, research and accountability; financing; and relationship to central administrative services. (Prerequisite: Permission of instructor. Next offered: 1986-87.)

CSP. 655 3 Credits Fall and Spring
Practicum in Student Personnel Administration (1 + 6)
Supervised field experience in student service agencies. Each of two semesters will require six hours per week in the pre-arranged work setting, as well as one additional hour per week for seminar sessions with the supervisors, instructor, and other practicum students. (Prerequisite: Permission of the instructor.)

CSP. 661 3 Credits Fall and Spring
Practicum in Counseling: Higher Education/Agency (0 + 9)
(Same as Coun. 661.)
Supervised field experience, including preparatory activities in a higher educational or agency setting. This course is not open to public school counselor-trainees. (Prerequisites: Couns. 623, 624 and three approved graduate credits in the area of specialization.)

Computer Science

C.S. 101 3 Credits Fall and Spring
Computers and Society (3 + 0)
A course in computer literacy for everyone. An overview of computing machines and the automatic processing of data. The interaction between social institutions and automated decision making. Some programming, but as a means of understanding the process rather than skill development.

C.S. 201 3 Credits Fall and Spring
Computer Programming I (2 + 3)

C.S. 202 3 Credits Fall and Spring
Computer Programming II (3 + 0)
A year sequence providing an introduction to problem solving, algorithm development, structured programming, top-down design, good programming style, and concurrent programming with extensive experience in a structured language (e.g. PASCAL, ADA, MODULA). (Prerequisites: For C.S. 201: previous introduction to programming and mathematics placement at the 200-level. For C.S. 202: C.S. 201.)

C.S. 281 3 Credits Fall
Computer Graphics (3 + 0)
Study of applications, design of graphics software, survey of input and output devices, two and three dimensional geometric transformations, curves, and surfaces. (Prerequisites: C.S. 201, Math. 201, and Math. 211.)

C.S. 301 3 Credits **Fall**
Computer Organization and Assembly Language (3 + 0)
Organization of computer registers, I/O, and control. Digital representation of data. Symbolic coding, instructions, addressing modes, program segmentation, linkage, macros, and subroutines. (Prerequisites: C.S. 201)

C.S. 311 3 Credits **Fall**
Data Structures and Algorithms (3 + 0)
Data structures and the algorithms for their manipulation. Arrays, tables stacks, queues, trees, linked lists, sorting, searching, and hashing. (Prerequisites: C.S. 202)

C.S. 321 3 Credits **Spring**
File Structure and Operating Systems (3 + 0)
The functions of files and operating systems, review of required architectural features. The PROCESS concept. Storage management, access methods and control, interrupt processing, scheduling algorithms, file organization and management, and resource accounting. (Prerequisite: C.S. 301)

C.S. 331 3 Credits **Spring**
Programming Languages (3 + 0)
A study of the syntax and semantics of widely differing programming languages. Syntax specification, block structure, binding, data structures, operators, and control structures. Comparison of several languages such as ALGOL, LISP, SNOBOL, and APL. Programming assignments in each language. (Prerequisite: C.S. 311)

C.S. 381 3 Credits **Alternate Spring**
Advanced Computer Graphics (3 + 0)
Graphics hardware, display programming, transformations, hidden line and surface elimination, approximation techniques for curve and surface representation, and project. (Prerequisites: C.S. 281 and Math 310. Next offered: 1986-87.)

C.S. 401 3 Credits **Spring**
Software Engineering (3 + 0)
Software design as an engineering discipline. Project planning, proposal writing, and management. Program design, verification, and documentation. Additional topics from security, legal aspects of software, and validation. Students will work on group projects and produce appropriate reports and a project history. (Prerequisites: C.S. 311, C.S. 321 & senior standing)

C.S. 411 3 Credits **Alternate Spring**
Analysis of Algorithms (3 + 0)
Analysis of classic algorithms, their implementation, and efficiency. Topics from combinatorics (sets, graphs, bit vectors), algebra (integer arithmetic, primes, polynomial arithmetic, GCD, Diophantine equations), systems (parsing searching, sorting), and theory (recursion, Turing machines). (Prerequisites: Math. 307, C.S. 311. Next offered. 1985-86.)

C.S. 425 3 Credits **Alternate Fall**
Data Base Systems (3 + 0)
Data independence, relationships, and organization. Hierarchical, network, and relational data models; canonical schema. Data description languages, query facilities, relational calculus. File organization and security, index organization, data integrity and reliability. (Prerequisites: C.S. 311, C.S. 321. Next offered: 1986-87.)

C.S. 442 3 Credits **Alternate Fall**
Computer Communication and Networks (3 + 0)
Review of communication terminology, baud rates, band width, noise, and error detection. Distributed processing and local and global networks. Interfacing problems, security, and reliability. Networks, ring vs. spoke linkage, packet switching, and path optimization. Examples: The ARPA net, Airline reservation systems. (Prerequisite: C.S. 321. Next offered: 1985-86.)

C.S. 448 3 Credits **Alternate Fall**
System Architecture (3 + 0)
Hardware, operating systems and their interaction. I/O, interrupts, memory management, concurrent processing, deadlock, modularity, system balancing, scheduling, protection, introduction to communications, and networks. (Prerequisites: E.E. 342, C.S. 321. Next offered: 1986-87.)

C.S. 451 3 Credits **Alternate Fall**
Automata and Formal Languages (3 + 0)
Finite automata, regular languages, finite transducers, context free language, push down automata, parsing algorithms, deterministic context free languages, recursive and recursively enumerable languages, decision procedures, and undecidability. (Prerequisites: Math. 307, C.S. 201. Next offered: 1985-86.)

C.S. 605 3 Credits **As Demand Warrants**
Artificial Intelligence (3 + 0)
The study and writing of programs that assimilate information, make inferences, and prove theorems. Representation of knowledge, pattern analysis, inference networks, and expert systems. Natural language analysis and synthesis. LISP as the basis for precise descriptions of AI processes. (Prerequisites: Consent of C.S. graudate advisor.)

C.S. 611 3 Credits **Fall**
Complexity of Algorithms (3 + 0)
Theoretical analysis of various algorithms: topics include sorting, searching, selection, polynomial evaluation, direct vs. iterative algorithms, NP completeness, decidadbility. (Prerequisites: C.S. 411 or consent of C.S. graduate advisor.)

C.S. 621 3 Credits **As Demand Warrants**
Advanced Systems Programming (3 + 0)
Multiprogramming and multiprocessing systems. File and program security. Scheduling optimization and system tuning. I/O processing, archiving and system recovery, and initialization. Study of current large systems. (Prerequisites: C.S. 311 and C.S. 321)

C.S. 622 3 Credits **Fall**
Performance Evaluation (3 + 0)
A survey of techniques of modeling and testing concurrent processes and the resources they share. Includes levels and types of system simulation, performance prediction, benchmarking and synthetic loading, hardware and software monitors. (Prerequisites: C.S. 321 or consent of C.S. graduate advisor.)

C.S. 631 3 Credits **As Demand Warrants**
Programming Language Implementation (3 + 0)
Formal treatment of programming language translation and compiler design. Parsing context free languages, translation specifications, machine independent code, BNF, scanners, symbol tables, parsers, and recursive descent. Programming of compiler or interpreter segments as projects. (Prerequisite: C.S. 331)

C.S. 641 3 Credits **Spring**
Advanced Systems Architecture (3 + 0)
A study of computer systems which have been developed to make processing of programs in high level languages and special types of processing more efficient or reliable. Examples include pipeline machines, array processors, tightly coupled multiprocessors, and data flow machines. (Prerequisites: C.S. 321 or consent of C.S. graduate advisor.)

C.S. 642 3 Credits **As Demand Warrants**
Distributed Processing (3 + 0)
A study of networks of interacting computers. The problems, rationales, and possible solutions for both distributed processing and distributed databases will be examined. Major national and international protocols including SNA, X.21, and X.25 will be presented.

C.S. 651 3 Credits **As Demand Warrants**
The Theory of Computation (3 + 0)
Formal models of algorithms: Turing machines and recursive functions. Space and time complexity of computation and complexity classes of problems. Program verification and methods of proving program correctness. (Prerequisite: C.S. 451)

C.S. 661 3 Credits **As Demand Warrants**
Optimization (3 + 0)
(Same as Math 661)
Linear and nonlinear programming, simplex method, duality and dual simplex method, post-optimal analysis, constrained and unconstrained nonlinear programming, Kuhn-Tucker condition. Applications to management, physical, and life sciences. Computational work with the computer. (Prerequisites: Knowledge of calculus, linear algebra, and computer programming.)

C.S. 662 3 Credits As Demand Warrants
Mathematical Software (3+0)
A survey of techniques for using the computer for mathematical applications. Includes techniques for symbolic and numerical differentiation and integration, unlimited precision arithmetic, polynomial manipulations, and introduction to symbolic manipulation systems, mathematical software libraries and the computation of special functions. (Prerequisites: Consent of C.S. graduate advisor.)

C.S. 681 3 Credits As Demand Warrants
Topics in Computer Graphics (3+0)
Hardware, software, and techniques used in computer graphics taken from such topics as refresh, storage, and raster scan technology, clipping, windowing, three dimensional techniques, painting and shading, image processing, computer aided design. (Prerequisite: C.S. 281 or consent of C.S. graduate advisor.)

C.S. 690 3 Credits Fall

C.S. 691 3 Credits Spring
Graduate Seminar and Project (3+0)
A two-semester seminar in which students will, individually or in teams, work on and present the results of major programming or literature survey projects in computer science. Written and oral reports will be required. Graded pass/fail. (Prerequisites: Completion of 12 credits in graduate computer science courses or consent of C.S. graduate advisor. C.S. 690 is prerequisite for C.S. 691.)

Counseling

Coun. 615 3 Credits Spring
Foundations of Guidance and Counseling (3+0)
Introduction to the philosophies, organization, patterns and techniques that aid counselors in preparing clients for responsible decision-making in modern society. (Prerequisite: Graduate standing.)

Coun. 623 3 Credits Fall
Principles of Individual Counseling (3+0)
Counseling techniques and procedures in education, social work and on a limited basis, clinical psychology; their applications by the classroom teacher and guidance specialist in assisting students with adjustment problems within a normal range. (Prerequisites: Coun. 615 and permission of instructor.)

Coun. 624 3 Credits Spring
Group Counseling (3+0)
Kinds and types of groups with emphasis on methods, problems and needed skills in working with groups in a counseling situation. (Prerequisites: Coun. 615, 623.)

Coun. 628 3 Credits Fall and Spring
Life Span Development (3+0)
The scientific study of the growth, development and behavioral changes of humans from conception through death, including an overview of the field of development, basic concepts and theories, history of the field, research in biological and biosocial influences on development. (Prerequisite: Graduate standing.)

Coun. 634 3 Credits Fall
Counseling Practicum I (2+7)
A supervised counseling experience with an agency that will provide direct and/or participant observation and interactions for the beginning counselor along with immediate feedback concerning the counseling experience. Weekly seminars will cover actual and role-playing situations concerning basic counseling skills, ethical issues, and advanced counseling techniques and interventions. (Prerequisites: Graduate standing and permission of instructor.)

Coun. 636 3 Credits Fall and Spring
Counseling Practicum II (0+9)
Advanced-level supervised experience in public school settings or social service agencies emphasizing individual and group counseling methods and techniques. (Prerequisite: Coun. 634 or permission of instructor.)

Coun. 645 3 Credits Alternate Spring
Behavioral Counsultation (3+0)
Presentation of techniques developing skills in consultation with parents, teachers, and other socialization agents to solve developmental and educational problems of children in the elementary school. Through application of the models, consultants are taught to assist in defining problems and to apply psychological principles to the development of plans to solve problems. (Prerequisite: Graduate standing in Elementary Counseling Consulting Program. Next offered: 1986-87.)

Coun. 660 3 Credits Fall
Cross-Cultural Counseling (3+0)
An examination of ethnic and cultural issues that affect the counseling setting, interaction, and outcome, including a review of the literature dealing with intercultural counseling, discussions of workable methods that have been used in such counseling, and examinations of target populations with whom the counselor may be involved, especially in Alaska. (Prerequisite: Permission of instructor.)

Coun. 661 3 Credits Fall and Spring
Practicum in Counseling: Higher Education/Agency (0+9)
(Same as CSP. 661.)
Supervised field experience, including preparatory activities in a higher educational or agency setting. This course is not open to public school counselor-trainees. (Prerequisites: Couns. 623, 624 and three approved graduate credits in the area of specialization.)

Cross Cultural Communication

CCC 103 3 Credits As Demand Warrants
Intensive Language Development (3+0)
An approach to problems of communication with special sensitivity to differences in culture, language, and the stylistic features which characterize informal, formal, spoken, and written usage. The balance among listening, speaking, writing, and reading will be determined by the needs of each class. Weekly conferences with the instructor are required. (Prerequisite: Approval of Rural Student Services.)

CCC 104 3 Credits Fall and Spring
University Communications (3+2)
Concept similar to Communication Skills 103, except that all material used will be correlated with a specified course elsewhere in the university in which the student is concurrently enrolled, and work will be focused on problems peculiar to that course. Weekly conferences with the instructor are required. May be repeated for credits when the correlated course is different. (Prerequisite: Approval of Rural Student Services.)

CCC 105 3 Credits As Demand Warrants
Intensive Reading Development (3+0)
Intensive instruction in reading, designed to encourage wide reading and vocabulary development and to develop the reading skills necessary for successful competition in college courses. Emphasis will be in the kind of materials commonly encountered by freshmen. Reading lab material will be available. Weekly conferences with the instructor are required. (Prerequisite: Approval of Rural Student Services.)

CCC 106 3 Credits Spring
Intensive Writing Development (3+0)
A writing program emphasizing the differences between speech and writing, narrative and factual reporting, with particular emphasis on the use of connectors and other organizational devices used in college writing. Weekly conferences with the instructor are required. (Prerequisite: Approval of Rural Student Services.)

CCC 107 3 Credits Spring
Intensive Writing Development II (3+0)
A continuation of the writing program started in CCC 106 for students inadequately prepared for Engl. 111. Instruction in the basic principles of writing with frequent writing assignments, emphasizing the use of standard English and organization patterns encountered in college assignments. Includes the writing and production of THEATA magazine. (Prerequisite: CCC 106.)

Economics

Admittance to upper division School of Management courses will be granted only to students with junior standing or above. Others will be admitted only with the written permission of the appropriate department head.

Econ. 101 3 Credits Fall and Spring
Introduction to Current Economic Problems (3 + 0) s
A one semester course designed primarily for the student who plans no further work in economics. The course utilizes a less theoretical approach than is customary in introductory economics courses and focuses on such current problems as unemployment, inflation, pollution, poverty, etc.

Econ. 137 3 Credits Spring
The Alaskan Economy (3 + 0) s
A broad introductory examination of economic problems in Alaska; analysis of historical trends and current patterns of economic growth; particular emphasis on present and future alternative economic policies, and their potential impacts.

Econ. 201 3 Credits (122) Fall and Spring
Principles of Economics I: Microeconomics (3 + 0) s
Theory of prices and markets, income distribution, contemporary problems of labor, agriculture, market structure, pollution, etc.

Econ. 202 3 Credits (121) Fall and Spring
Principles of Economics II: Macroeconomics (3 + 0) s
Analysis and theory of national income, money and banking, and stabilization policy.

Econ. 226 3 Credits Fall and Spring
Introduction to Statistics for Economics and Business (3 + 0)
Problems in economics and business translated into statistical terms. Topics covered include descriptive measures, probability and probability distributions, sampling methods, sampling distributions, point and interval estimation, hypothesis testing, index numbers, and time series analysis. Materials fee: $20.00 (Prerequisite: Math. 107-108 or Math. 161.)

Econ. 227 3 Credits (324) Fall and Spring
Intermediate Statistics for Economics and Business (3 + 0)
Extension of topics developed in Economics 226. Development of statistical techniques and their application to economic and business problems. Topics include simple and multiple regression and correlation, analysis of variance, forecasting techniques, quality control, non-parametric methods, and decision theory. Materials fee: $20.00 (Prerequisites: Econ. 226, Math. 162 or 200.)

Econ. 235 3 Credits Fall
Introduction to Natural Resource Economics (3 + 0) s
Introduction to microeconomic principles and their application to natural resource issues. Specific topics include supply, demand, marginality, optimality, elementary production economics, economic rent, and comparative advantage. These principles are applied to agency budget allocation decisions, multiple use, resource valuation, conservation, market failure, and public outdoor recreation problems.

Econ. 321 3 Credits Fall
Intermediate Microeconomics (3 + 0) s
Analysis of demand and supply under various market forms, cost and theory of production, factor pricing and theory of distribution, and survey of welfare economics. (Prerequisites: Econ. 201, 202 and Math. 162 or equivalent.)

Econ. 322 3 Credits Fall and Spring
Managerial Economics (3 + 0)
Interpretation of economic data and applications of economic theory in business firms. Bridging the gap between theory and practice through empirical studies, cases, and decision problems. Particular emphasis upon decision-making based heavily upon analysis of data developed from research. Materials fee: $20.00 (Prerequisites: Econ. 201, 202 and 227 and Math. 162 or equivalent.)

Econ. 324 3 Credits Spring
Intermediate Macroeconomics (3 + 0) s
Concepts and measurement of income, analysis of aggregate demand and supply and their relation to the level of prices, employment, and economic growth. (Prerequisites: Econ. 201, 202 and Math. 162 or equivalent.)

Econ. 335 3 Credits Spring
Intermediate Natural Resource Economics (3 + 0) s
Extension of concepts developed in Econ. 235, using a higher level of economic analysis in examining natural resource issues. Specific topics include welfare economics and economic efficiency concepts, benefit/cost analysis, resource allocation overtime, resource taxation, common property problems, externalities, public goods, valuation of non-market resources, and land use planning issues. (Prerequisites: Econ. 202 or Econ. 235.)

Econ. 350 3 Credits Fall
Money and Banking (3 + 0) s
The liquid wealth system in the United States, to include the commercial banking system, the Federal Reserve System, and nonbank financial institutions; the regulation of money and credit and its impact on macroeconomic policy objectives. Materials fee: $10.00 (Prerequisites: Econ. 201 and 202.)

Econ. 351 3 Credits Alternate Spring
Public Finance (3 + 0) s
Economic justifications for government; federal, state and local government, taxation, spending and debt; their effects on allocation, distribution, stabilization and growth. (Prerequisites: Econ. 201 and 202. Next offered 1985-86.)

Econ. 409 3 Credits Alternate Spring
Industrial Organization and Public Policy (3 + 0) s
The study of the relationship of market structure to the economic conduct and performance of firms and industries, the determinants, measurement and classification of market structure, public policy toward mergers, industrial concentration, and aggregate concentration. (Prerequisites: Econ. 201, 202, and 321. Next offered: 1985-86.)

Econ. 420 3 Credits Fall
Labor/Management Relations (3 + 0) s
History of the organized labor movement, labor legislation, and cases with emphasis on Taft-Hartley, Landrum-Griffin, Railway Labor, and Alaska Public Employment Relations Acts. Labor market analysis and wage theory, collective bargaining, equal employment opportunity laws, and cases. (Prerequisites: Econ. 201 and 202.)

Econ. 421 3 Credits Alternate Spring
Collective Bargaining (3 + 0)
History, theory, and practice of collective bargaining. Attention will also be given to the administration of collective bargaining contracts with special emphasis in the grievance procedure and the process of grievance arbitration. (Prerequisites: Econ. 201, 202; or permission of instructor. Econ. 420 recommended. Next offered: 1986-87.)

Econ. 436 3 Credits Spring
Energy Economics (3 + 0) s
A course concerned with market forces and institutions affecting the allocation of energy resources. Special attention is given to intertemporal allocative decisions and the role that public policy plays in influencing the rate at which energy resources are used over time. (Prerequisites: Econ. 201 or 235.)

Econ. 437 3 Credits Alternate Fall
Regional Economic Development (3 + 0)
Determinants and effects of the spatial distribution of economic activity. Impact of public policy on regional development within the Alaska context. (Prerequisites: Econ. 201 and 202. Next offered: 1986-87.)

Econ. 438 3 Credits Spring
The Economics of Fisheries Management (3 + 0)
The course will provide a review of theoretical economic concepts as they are applied to the management of a commercial fishery, as well as an introduction to major current management policy issues affecting United States' commercial fishing. Major emphasis will be placed on the practical application of the economic theory and policy insights derived from the course to the problems of the management of Alaska's fisheries. (Prerequisites: Econ. 321, or equivalent, or Econ. 335.)

Econ. 451 3 Credits Spring
Public Expenditure Analysis (3 + 0)
Purposes and economic effects of governmental expenditures, budgeting techniques, and their effects on resource allocation. (Prerequisite: Econ. 201 and 202 or equivalent.)

Econ. 463 3 Credits Alternate Fall
International Economics (3 + 0) s
Pure theory of international trade: comparative cost, terms of trade, and factor movements. International disequilibrium: balance of payments and its impact on national economy, capital movement, economic development through international trade. (Prerequisites: Econ. 201 and 202. Next offered: 1985-86.)

Econ. 475 1-3 Credits Fall and Spring
Economic Internship
Designed to give students the opportunity to do research or other practical work with business, governmental agencies, or research organizations. (Prerequisite: Admission by permission of instructor.)

Econ. 501 3 Credits Fall
Principles of Economic Analysis (3 + 0)
An accelerated course in economic principles and analysis with applications to business decisions. This course is designed for masters of business administration students without sufficient undergraduate preparation in economics, and engineering students desiring a rigorous one semester course in economics. This course will not be accepted for elective credit in the MBA program. (Prerequisites: Graduate standing.)

Econ. 601 3 Credits Fall
Microeconomic Theory I (3 + 0)
Analysis of consumer and producer theory, price determination, and welfare economics. (Prerequisites: Econ 321 or equivalent; Math 162, Math 200, Math 273 or equivalent.)

Econ. 603 3 Credits Spring
Macroeconomic Theory I (3 + 0)
Analysis of the underlying causes of unemployment, economic instability, inflation, and economic growth. (Prerequisites: Econ. 321 or equivalent; Econ. 324 or equivalent; Math. 162, Math. 200, Math. 273 or equivalent.)

Econ. 623 3 Credits Fall
Mathematical Economics (3 + 0)
Mathematical techniques including matrix algebra, differential and integral calculus. Particular attention is given to static and comparative statics analysis and dynamic models. (Prerequisite: Math. 162, Math. 200, Math. 273 or equivalent.)

Econ. 624 3 Credits Fall
Managerial Economics (3 + 0)
This course includes the development of basic economic concepts and their application to managerial decision-making. Major topics to be covered will include: demand and cost analysis, pricing decisions, capital budgeting and capital management, and decision-making under conditions of risk and uncertainty. The case method will be used as a principle technique for application of the concepts and tools to "real world" situations. Materials fee: $20.00 (Prerequisites: Econ. 201 and 202; or Econ. 501; and graduate standing.)

Econ. 626 3 Credits Spring
Econometrics (3 + 0)
Introduction to econometric theory. Single equation and multiple equation system estimation, including inference and hypothesis testing and results of assumption violation. Materials fee: $20.00 (Prerequisites: Math 162, Math 200, Math 273 or equivalent; AS 301, Econ. 227 or equivalent.)

Econ. 635 3 Credits Fall
Resource Economics I (3 + 0)

Econ. 636 3 Credits Spring
Resource Economics II (3 + 0)
The theory, methods of analysis, and current literature of natural resource economics and policy. Topics include socially optimal intertemporal use of resources, common property resources, common property resources, externalities, property rights, public goods, benefit-cost analysis, amenity values and other non-market resource services, and environmental policy. (Prerequisites: Econ. 321 or equivalent; Math. 200, 273 or equivalent. For Econ. 636, Econ. 635.)

Econ. 670 1 Credit Spring
Seminar in Research Methodology (1 + 0)
Philosophy of research and importance of the scientific method to solution of research problems. (Prerequisite: Graduate standing.)

Education

Ed. 201 3 Credits Fall and Spring
Introduction to Education (2 + 3)
The prospective teacher is acquainted with the nature of teaching including the scholastic, professional, and personality requirements for effective teaching. Involves laboratory time in public schools as teacher's aide. Open to all students. Required for all students majoring in Education. (Prerequisite: Sophomore standing.)

Ed. 303 3 Credits As Demands Warrant
Language Development (3 + 0)
Principles, procedures, and materials for enhancing the language development of young children. (Prerequisite: Psy. 240.)

Ed. 304 3 Credits Fall and Spring
Literature for Children (2 + 3)
Criteria for evaluating children's books and application of criteria to books selected by student, study of outstanding authors, illustrators and content of specific categories of literature, book selection aids, and effective use of literature to promote learning. (Prerequisite: Junior standing.)

Ed. 305 4 Credits Fall and Spring
Introduction to Secondary Education (3 + 3)
Development of a working concept of secondary education in the U.S., its history, objectives, curriculum, organization, practices, and consideration of current issues. Laboratory experience involves three hours per week of observation and participation in local junior and senior high schools. (Prerequisite: Junior standing or permission of instructor.)

Ed. 309 3 Credits Fall
Elementary School Music Methods (3 + 0) (Same as Mus. 309)
Principles, procedures, and materials for teaching music to children at the elementary level. (Prerequisite: Ed. 330.)

Ed. 310 3 Credits Fall and Spring
Modes of Creative Expression in Education (3 + 0)
A study of a variety of modes for stimulating creative expression in an educational setting such as art, music, dance, drama, photography and the use of video as an expressive media. Particular emphasis will be on methods of incorporating these modes into teaching practices, to enhance the interest in, and quality of learning. (Prerequisite: Ed. 330.)

Ed. 311 2 Credits Spring
Audio-Visual Methods and Materials (1 + 3)
Selection and use of audio-visual materials in teaching and learning at all levels of education. (Prerequisite: Ed. 330.)

Ed. 330 3 Credits Fall and Spring
Diagnosis and Evaluation of Learning (3 + 0)
Detailed information about the teaching-learning process in the classroom emphasizing making teaching decision. The student will learn the strengths and weaknesses of various forms of diagnosis and evaluation of learning, with particular emphasis on problems encountered in cross-cultural settings. Attention will be given to informal, formal, process, and product assessment. (Prerequisite: Psy. 240.)

Ed. 333 3 Credits As Demand Warrants
History of Childhood (3 + 0)
Surveys child rearing practices in the major cultures of the world examining how parents and children related to each other in different time periods. Examines the central force for change in history as psychogenic changes in personality, occurring between parent-child interaction through successive generations. (Prerequisite: Junior standing.)

Ed. 338 3 Credits As Demand Warrants
Education and Economic Development (3 + 0)
An examination of both theory and evidence linking varied forms of education to economic growth and development. A comparative approach is utilized to explore similarities and differences between rural Alaskan regional development and systematic nation-building efforts in developing countries. (Prerequisite: Permission of instructor.)

Ed. 345 3 Credits Fall
Sociology of Education (3 + 0)
(Same as Soc. 345)
Examination of the ways in which social, political, and economic forces influence what happens in schools with focus on how the organization of schools affects what teachers can do in the classroom, how peer groups affect student learning, and how national political and economic concerns determine what becomes an educational issue. (Prerequisites: Soc. 101 and Junior standing.)

Ed. 346 3 Credits Fall
Structure of American Education (3 + 0)
Fundamentals of public school organization, control and support in relation to federal, state and local agencies. Issues related to the structure and delivery of educational services are analyzed with particular attention given to issues in Alaska. (Prerequisite: Junior standing in Education.)

Ed. 350 3 Credits Fall and Spring
Communication in Cross-Cultural Classrooms (3 + 0)
An interdisciplinary examination of communication and language in cross-cultural educational situations, including language, literacy, and inter-ethnic communication as they relate directly to classrooms in Alaska. (Prerequisites: Ling. 101 or ANL 215 or ANL 216 or permission of instructor.)

Ed. 380 3 Credits Spring
Cultural Influences in Education (3 + 0)
Interdisciplinary study of the educational problems, concerns and successes encountered by students and teachers in a variety of cultural contexts. Students will consider social, cultural and psychological factors inherent in the educational process and how they are affected by the multicultural setting through an investigation of a variety of cultural contact situations. Specific attention will be given to curriculum improvement and teaching strategies appropriate for the multicultural classroom and school. (Prerequisite: Ed. 330 and junior standing).

Ed. 402 3 Credits Fall and Spring
Methods of Teaching in the Secondary School (2 + 3)
Principles and methods of teaching appropriate for junior high and high school classrooms. Includes planning for effective teaching, classroom management, and the implementation of teaching plans in classroom settings. (Prerequisite: This course should be taken the semester prior to Ed. 453, Secondary Student Teaching.)

Ed. 407 3 Credits Fall and Spring
Reading Strategies for Secondary Teachers (3 + 0)
Techniques and materials to be used in helping the secondary students acquire the skills necessary for greater comprehension of subject matter at the secondary level. Should be taken concurrently with Ed. 402. (Prerequisites: Ed. 330 and junior standing.)

Ed. 412 3 Credits Fall
Computer Word Processing and Telecommunications in Education (1 + 6)
Development of a solid background in the use of microcomputers (using Apple II as the example) in communicating between micros and computer networks. Smart terminal software, uploading and downloading Pascal text files, accessing the University of Alaska Computer Network and the SOURCE, educational implications of distributed information networks as support for inservice teachers, and word processing for use in language arts curriculum. (Prerequisites: Upper division Education status or certified teacher.)

Ed. 419 6 Credits Fall and Spring
Integrated Methods in Cross-Cultural Classrooms (2 + 12)
The study of the unique and common concepts, content, methods and materials which characterize the teaching of mathematics, science, social studies and language arts; the development of written plans and units; and practical experience in the elementary schools. (Prerequisites: Psy. 240, Ed. 330, concurrent enrollment with Ed. 423. Should be taken semester prior to student teaching.)

Ed. 423 6 Credits Fall and Spring
Reading, Language and Literacy (5 + 3)
Concepts, methodology, instructional materials and language arts content relevant to the instruction of developmental reading, language and literacy in grades K through 8. Includes limited field experience. (Prerequisites: Psy. 240, Ed. 330, concurrent enrollment with Ed. 419. Should be taken semester prior to student teaching.)

Ed. 424 3 Credits Fall
Small High School Programs (3 + 0)
After examining secondary programs in general, students will be exposed to alternative approaches to the design of small high school programs, with particular emphasis on the problems of designing secondary programs for the small rural communities of Alaska. (Prerequisites: Ed. 330 and junior standing.)

Ed. 425 3 Credits Spring
Community as an Educational Resource (2 + 3)
Practical experience to assist the student in developing greater awareness of the community as an educational resource. Methods and techniques for developing and implementing a community-oriented curriculum with practical experience in determining and using community resources will be provided. (Prerequisites: Ed. 330 and junior standing.)

Ed. 429 3 Credits Spring
Microcomputer Application in the Classroom (2 + 2)
Strategies for the effective use of microcomputers in the classroom; understanding of the potentials and limitations of the computer in the schools; developing classroom plans to take advantage of computer potentials; and evaluation of educational software. (Prerequisites: Upper-division undergraduate or certified teacher status.)

Ed. 430 3 Credits Fall and Spring
Multicultural Teaching Techniques (3 + 0)
Development of effective teaching strategies for implementation in cross-cultural and multicultural classrooms with particular attention to instructional practices for secondary schools (small school design, computer-based instruction, telecommunications, community-based education, interdisciplinary linkages of coursework, experiential education, productive thinking skills, and individual programmed instruction). Guest lectures and field trips. There will be weekly participation in a practica experience in multicultural classrooms. (Prerequisite: Psy. 240.)

Ed. 450 3 Credits Spring
Education and Cultural Transmission (3 + 0)
Education as a process for transmitting culture with examination of various issues related to cultural transmission in a multi-cultural environment, with particular emphasis on the dynamics of cultural change. (Prerequisite: Ed. 330 and junior standing.)

Ed. 451 1 Credit Fall and Spring
Practicum in Education (0 + 4)
Practical application of general ideas and techniques addressed in the methods courses in which the student is concurrently enrolled. (Prerequisites: Ed. 330 and permission of instructor.)

Ed. 452 12 Credits Fall and Spring
Elementary Student Teaching (1 + 33)
Supervised teaching in elementary schools approved by the department of education. The school may limit registration, determine assignments, and cancel the registration of students doing unsatisfactory work. Students should expect to be involved in the public school setting for the entire school day for the duration of the university semester in fulfilling their assignment. Some full days are required. (Prerequisites: See requirements for admission to student teaching, page 99.)

Ed. 453 12 Credits Fall and Spring
Secondary Student Teaching (1 + 33)
Supervised teaching in secondary schools approved by the department of education. The school may limit registration, determine assignments, and cancel the registration of students doing unsatisfactory work. Students should expect to be involved in the public school setting for the entire school day for the duration of the university semester in fulfilling their assignment. (Prerequisites: See requirements for admission to student teaching, page 99.)

Ed. 462 3 Credits Fall
Alaskan Environmental Education (3 + 0)
(Same as A.L.R. 462)
Environmental concepts, motivational and discovery techniques, and practical skills for utilizing the environment inside and outside the formal classroom in all subject areas. Course content includes information on curriculum materials (K-12), interpretive and audiovisual aids facilities, environmental problem solving and applications of environmental education to situations from the public schools to summer campus, short courses, and workshops for individuals of any age. (Prerequisites: Junior standing or permission of instructor.)

Ed. 470 3 Credits As Demand Warrants
Human Resource Development (3 + 0)
Strategies and approaches which emphasize the mobilization and utilization of human resources within the general processes of socio-economic change and development in historical and cross-national contexts. (Prerequisite: Junior standing.)

Ed. 473 3 Credits Spring
Marine Education (3 + 0)
Instructional techniques and methods for intergrating marine and freshwater programs into schools and communities. The elementary school Alaska Sea Week Curriculum Guides, plus a variety of secondary level marine education materials, their design and implementation will be highlighted as well as a survey of marine biology, oceanography, fisheries, birds, marine mammals, freshwater ecology and the social and political implications of coastal and river issues. (Prerequisites: Biol. 105-106 and Ocn. 111 or its equivalent.)

Ed. 475 3 Credits Alternate Spring
LOGO: A Computer Language for Teachers (3 + 0)
The study of the use of the LOGO language with Apple computers including the implications of this language for education and ways in which it can be incorporated into the curriculum. (Prerequisite: Upper division undergraduate or certified teacher status. Next offered: 1986-87.)

Ed. 480 3 Credits Fall and Spring
Curriculum Development in Cultural Perspective (3 + 0)
An examination of issues related to the development of curriculum programs and materials in a cross-cultural environment. Emphasis will be on process, context, and content of curriculum as well as curriculum change and evaluation strategies. Students will work on a curriculum development project applicable to their individual circumstances. (Prerequisite: Ed. 330.)

Ed. 601 3 Credits Fall
Critique of Educational Research Methods (3 + 0)
Techniques of selection and evaluation of educational research methods. Use of library reference tools, review of research studies, and critical communication of quantitative and qualitative research procedures. (Prerequisite: Graduate standing in education.)

Ed. 602 3 Credits Spring
Proseminar in Applied Educational Research (1 + 6)
The application of educational research methods and techniques to educational issues and problems. Using Education 601 as a foundation, the student will conduct a research project under direct supervision of faculty. Proposal development and application of research to practical problems is stressed. (Prerequisite: Ed. 601, Critique of Ed. Res. Meth.)

Ed. 603 3 Credits As Demand Warrants
Field Study Methods in Educational Research (3 + 0)
Techniques for conducting field research in a cross-cultural setting with particular attention given to research in education or a related field. Students must have access to a field setting in which to conduct a research project. (Prerequisite: Ed. 601, Ed. 610, or concurrent with Ed. 610)

Ed. 610 3 Credits Fall
Education and Cultural Processes (3 + 0)
Advanced study of the function of education as a cultural process and its relation to other aspects of a cultural system. Students will be required to prepare a study in which they examine some aspect of education in a particular cultural context. (Prerequisite: the course may be taken concurrently with Ed. 601, Ed. 602 or Ed. 603.)

Ed. 611 3 Credits As Demand Warrants
Learning, Thinking, and Perception in Cultural Perspective (3 + 0)
An examination of the relationships between learning, thinking and perception in multicultural contexts. Particular emphasis will be on the implications of these relationships for schooling. Content will focus on cultural influences on perception, conceptual processes, learning, memory and problem solving. Content will also reflect concern for practical teaching problems. (Prerequisite: Graduate standing in education, Ed. 610 recommended.)

Ed. 612 3 Credits Spring
Cultural and Philosophical Foundations of Education (3 + 0)
Students will be introduced to the nature of philosophical inquiry and apply a philosophical perspective to examining assumptions inherent in cultural systems and culturally organized behavior. Education as a function of culturally organized behavior is based upon assumptions which are not always explicit. The philosophical perspective provides a framework and approach for explicitly subjecting these assumptions to analysis. (Prerequisite: Graduate standing in education.)

Ed. 615 3 Credits Fall
Social Organization of Classrooms and Learning (3 + 0)
An examination of the social organization of participants (school staff and students) within the institutional framework of American Public Education with particular emphasis focused on everyday life features of the social organization that accommodate and maintain the institutional framework. Dilemmas inherent in transplanting this institutional framework and social organization to sociocultural environments different from that of their origins are also examined. [Prerequisite: Ed. 601, (Crit. of Ed. Res. Meth.), Ed. 610, (Ed. and Cult. Proc.)]

Ed. 616 3 Credits As Demand Warrants
Education and Socio-Economic Change (3 + 0)
An examination of social change processes, particularly in relation to the deliberate development of new institutions and resulting forms of new consciousness. Emphasis is placed on the role of education and schooling in this development dynamic. [Prerequisite: Ed. 601, (Crit. of Ed. Res. Math.), Ed. 610, (Ed. and Cult. Proc.), or permission of instructor.]

Ed. 617 3 Credits Spring
Human Relations in Education (3 + 0)
Designed to develop actualizing behavior for the student and those he/she encounters. (Prerequisite: Graduate standing.)

Ed. 618 3 Credits Spring
Higher Education: Basic Understandings (3 + 0)
Historical and philosophical foundations of higher education, both in America and abroad. Examination of curriculum development, instruction, administration, and interinstitutional cooperation, with emphasis on trends and innovations in higher education. (Prerequisites: Graduate standing and permission of the instructor.)

Ed. 620 3 Credits Spring
Language, Literacy and Learning (3 + 0)
This course examines the relationships among language, culture, and thinking as issues of literacy and learning. Specific areas of emphasis include linguistic relativity, discourse, role of context in communications, variant language learning strategies and styles, speech community, open and closed linguistic systems, cognitive styles, and literacy as a cultural and cognitive phenomenon. (Prerequisite: Graduate standing.)

Ed. 621 3 Credits Fall
Cultural Aspects of Language Acquisition (3 + 0)
A focus on cultural differences in a child's acquisition of language and culture. The notion that specific language/learning/teaching strategies are also general learning/teaching strategies is stressed. Verbal and nonverbal behavior, cultural formats for learning through interaction and social dimensions of second language acquisition are considered. (Prerequisite: Graduate standing.)

Ed. 630 3 Credits Fall
Curriculum Theory (3 + 0)
A comprehensive theoretical view of curriculum as a field which integrates the related phenomena in such a way that is is possible to describe, predict, explain and serve as a guide for curriculum activities. (Prerequisite: Graduate standing in education.)

Ed. 631 3 Credits Spring
Small Schools Curriculum Design (3 + 0)
A focus on the salient issues involved with the development of effective programs of instruction in small schools including foundational design, conceptual models, organizational strategies, technical skills, current issues and trends, and their implications and application to the environment of rural Alaska. (Prerequisite: Graduate standing in education.)

Ed. 635 3 Credits Fall and Spring
Strategies for Cooperating Teachers (3+0)
Study of effective teaching using alternative strategies appropriate to differing goals. Consideration will also be given to teaming with and/or supervising student teachers as a technique for improving instruction. (Prerequisite: Certified teacher employed in a school district.)

Ed. 636 3 Credits Alternate Spring
The Improvement of Elementary Teaching (3+0)
Emphasis on improvement of elementary teaching: a re-evaluation of teaching practices, relating of principles of learning, instructional procedures, and recent developments in education to situations made meaningful through the student's teaching experience. (Prerequisites: Graduate standing in education and elementary teaching experience. Next offered 1985-86.)

Ed. 637 3 Credits Fall
Diagnosis and Correction of Reading Deficiencies (3+0)
Nature of the reading process, emphasis on psychology involved in discerning reading difficulties, testing programs to ascertain specific disabilities in readiness, vocabulary and word-attack, comprehension, speed and accuracy, specific suggestions for their correction, and newer approaches to teaching reading. (Prerequisite: Experience in the teaching of reading.)

Ed. 638 3 Credits Spring
Reading Lab (0+9)
Working with a child who has been identified as having reading problems using testing and remedial techniques appropriate to his need. (Prerequisite: Ed. 637.)

Ed. 639 3 Credits Spring
Reading in Secondary Schools (3+0)
Identification of the general goals of reading instruction on the secondary level. An approach to the improvement of learning in the content subjects through the refinement of needed reading skills. Includes guidelines and practical projects for pre- and in-service content area teachers. (Prerequisites: Graduate standing and teaching experience.)

Ed. 645 3 Credits Summer
Small Schools Institute (2+3)
A forum for experienced elementary and secondary rural school teachers. Discussions and seminars held with University and guest faculty, whose fields of expertise have direct applicability to small school concerns, will provide an environment for participants to share and refine different inter-ethnic communicative styles, culturally congruent teaching methodologies and curricula, and contextual understandings of the Native pupil's world. (Prerequisites: Recent prior rural Alaskan small schools teaching experience.)

Ed. 646 3 Credits Summer
Orientation to Teaching in Rural Alaska (2+3)
A study of the needs of rural schools, their environments and the recipients of school services with special attention given to cross-cultural educational issues. (Prerequisite: Graduate standing.)

Ed. 650 3 Credits Fall
Organizational Behavior in Schools (3+0)
Responsibility pertaining to the organization of a school and the direction of personnel. Functions of instructional leadership in cross-cultural perspective. Public school organization in both urban and rural settings. Problems incidental to public school administration in Alaska. (Prerequisite: Graduate standing, teaching experience.)

Ed. 651 3 Credits Spring
Large and Small School Management Processes (3+0)
A comparative and analytical perspective of management processes used in dispersed educational organizations and in centralized educational organizations. Particular attention is given to management problems that confront Alaskan administrators. Case studies used reflect the nature of Alaskan schools. (Prerequisites: Graduate standing in education.)

Ed. 652 3 Credits Spring
Effective Schooling Practices (3+0)
An examination of school improvement procedures, including the history of school improvement and the analysis of contemporary methods and procedures in effective schooling practices. (Prerequisites: Graduate standing in Education.)

Ed. 653 3 Credits Spring
Instructional Leadership in Public Schools (3+0)
A study of the analytical and practical competencies necessary to understand and exercise instructional leadership in the public schools. Leadership is examined in its historical and theoretical contexts. Supervision and interpersonal communications are emphasized as they relate to instructional leadership. (Prerequisites: Graduate standing in education.)

Ed. 654 3 Credits Fall
School Law (3+0)
Rights and responsibilities of teachers and pupils, rulings of the Attorney General, decisions of the courts, and regulations of the State Board of Education. (Prerequisite: Graduate standing in education.)

Ed. 655 3 Credits Alternate Spring
Public School Finance (3+0)
Contemporary basis for raising and distributing federal, state and local education funds; problems of school financing in Alaska. (Prerequisite: Graduate standing in education. Next offered: 1986-87.)

Ed. 660 3 Credits Spring
Educational Administration in Cultural Perspective (3+0)
The course will examine issues related to the social organization and socio-political context of schools, administrative and institutional change processes and the changing role of administrators in education, using a cross-cultural framework for analysis. (Prerequisite: Graduate standing.)

Ed. 664 3-6 Credits Fall and Spring
Internship: Principal's Endorsement (0+9)
Field work in an appropriate educational or agency setting. Each student will complete an approved field study project. (Prerequisites: Approval of student's advisory committee.)

Ed. 665 3-6 Credits Fall and Spring
Internship: Superintendent's Endorsement (0+9)
Field work in an appropriate educational or agency setting. Each student will complete an approved field study project. (Prerequisites: Approval of student's advisory committee and admission to candidacy for the Ed.S. degree in School Administration.)

Ed. 690 3 Credits Spring
Seminar in Cross-Cultural Studies (3+0)
An investigation of current issues in cross-cultural contexts. The seminars will provide an opportunity for students to synthesize their prior graduate studies and research, and shall be taken near the terminus of their graduate programs. (Prerequisites: Advancement to candidacy, permission of student's graduate committee.)

Electrical Engineering

E.E. 102 3 Credits Spring
Introduction to Electrical Engineering (3+0)
Basic modern devices, concepts, technical skills, and instruments of electrical engineering. (Corequisite: Math. 200.)*

E.E. 203 4 Credits Fall and Spring
Electrical Engineering Fundamentals I (3+3)
Analysis of alternating-current circuits using complex notation and phasor diagrams, resonance, transformers, Fourier analysis, the complex frequency plane, and three-phase circuits. Introduction to network and system analysis. (Prerequisites: Math. 200. E.E. 102.)*

E.E. 204 4 Credits Fall and Spring
Electrical Engineering Fundamentals II (3+3)
Electronics of vacuum and solid state devices, amplifier design, digital circuits, energy conversion, electromechanics, control systems, and instrumentation. (Prerequisite: E.E. 203.)*

E.E. 303 4 Credits Fall
Electrical Machinery (3+3)
Electromechanical energy conversion principles, characteristics and applications of transformers, DC machines, synchronous and induction machines. Introduction to electric power systems. (Prerequisite: E.E. 204.)*

E.E. 331 1 Credit Fall
High Frequency Lab (0+3)
Laboratory experiments in transmission lines, impedances, bridges, scattering parameters, hybrids, and waveguides. (Corequisite: Phys. 331.)*

E.E. 332 4 Credits **Spring**
Electromagnetic Waves and Devices (3 + 3)
Theory and design of antennas, waveguides, and other periodic structures, with an emphasis on impedance concepts. Antenna arrays, broadband design techniques, and related topics. Theory and design of practical communications links including satellite earth stations and fiber optics systems. (Prerequisites: E.E. 331, Phys. 331.)

E.E. 333 4 Credits **Fall**
Physical Electronics (3 + 3)
Basic properties of semiconductors. Principles of semiconductor devices diodes, transistors, and integrated circuits. (Prerequisite: E.E. 204.)*

E.E. 334 4 Credits **Spring**
Electronic Circuit Design (3 + 3)
Application of semiconductor devices in the design of circuits used in computation, automatic control, and communication. (Prerequisite: E.E. 333.)*

E.E. 341 4 Credits **Fall**
Computer Organization I (3 + 3)
Modular structure of computer systems: hardware and firmware techniques of realizing logical functions and types and purposes of peripherals with methods of interface. (Prerequisites: C.S. 201 and one year of college physics.)

E.E. 342 4 Credits **Spring**
Computer Organization II (3 + 3)
Techniques of constructing input/output device drivers, dedicated signal processors, and central processor unit microprogrammable bit slice devices. (Prerequisite: E.E. 341.)

E.E. 353 3 Credits **Fall**
Circuit Theory I (3 + 0)
Transient analysis by Laplace transform, state variable, and Fourier methods, filter networks, and computer aided analysis. (Prerequisite: E.E. 204.)*

E.E. 354 3 Credits **Spring**
Engineering Signal Analysis (3 + 0)
Analysis of both continuous and discrete-time signals and systems. Fundamentals and applications of probability, statistics and stochastic processis to linear, time-invariant systems. Development and applications of convolution, z-transform and Laplace transform theory to filters, modulation, multiplexing, sampling, interpolation, and related processes. (Prerequisite: E.E. 353, Math 302.)

E.E. 404 4 Credits **Spring**
Electrical Power Systems (3 + 3)
Alternate energy sources, transmission system components, elements of control, system protection, and interconnections. (Prerequisite: E.E. 303.)*

E.E. 406 4 Credits **Fall**
Electrical Power Engineering (3 + 3)
Symmetrical and unsymmetrical faults, load flow, economic operation of power systems, dynamic power system, stability, and computer aided fault and load flow analysis. (Prerequisites: E.E. 404 or equivalent.)

E.E. 442 4 Credits **Fall**
Digital Systems Analysis and Design I (3 + 3)
Combinational and Sequential logic implementation with Medium Scale Integration (MSI) Algorithmic State Machine (ASM) design and implementation with Medium and Large Scale Integration (MSI/LSI) and microprocessors; Central Processor Unit (CPU) analysis and implementation with microprogrammable, "bit-slice" hardware; basic microcomputer input/output (I/O); digital data transmission techniques. (Prerequisites: E.E. 204 and E.E. 333 - may be taken concurrently.)

E.E. 443 4 Credits **Spring**
Digital Systems Analysis and Design II (3 + 3)
Microcomputer interfacing; timing/transmission line effects in logic design; analog-digital and digital-analog converters; basic digital filtering with microcomputers; 8 bit and 16 bit microprocessor organization, operation and programming; computer peripherals; digital signal processing hardware. (Prerequisite: E.E. 442.)

E.E. 451 3 Credits **Fall**
Digital Signal Processing (2 + 3)
Discrete Fourier Transform (DFT) analyses and applications; FFT implementations; discrete convolution/correlation/statistical theory with application; errors and noise analysis; FIR/IIR filter design and implementation techniques. (Prerequisites: E.E. 354 or equivalent.)

E.E. 454 4 Credits **Spring**
Advanced Digital Systems Application and Design (3 + 3)
Advanced, topical applications of digital techniques in the areas of high speed signal processing, process control, data transmission and speech synthesis. Emphasis on recent developments and custom design. (Prerequisites: E.E. 442 and senior standing.)

E.E. 461 4 Credits **Fall**
Communication Systems (3 + 3)
Utilization of communication theory in the design and implementation of communication systems. Laboratory measurement of modulation, noise, channel spectrum, satellite link budget, and microwave path design.

E.E. 462 4 Credits **Spring**
Communication Systems (3 + 3)
Theory and practice of communications systems, introduction to probability, statistics, and information theory, systems design and laboratory experience in analog and digital communication. (Prerequisite: E.E. 354, E.E. 334.)*

E.E. 464 3 Credits **Spring**
Communication Networks (3 + 0)
Design of voice and data communication networks. Traffic measurement, network topology, circuit sizing, and network performance measures. Tariffs and economic considerations. Cost-performance relationships. (Prerequisites: E.E. 204 and Math 302.)

E.E. 471 4 Credits **Spring**
Fundamentals of Automatic Control (4 + 0)
Linear system representation by transfer functions and state variables. The concept of feedback. Time and frequency response of linear systems. Identification. Controllability and observability. Stability by Routh-Hurwitz criterion and frequency plane methods. Specifications of higher order linear systems. System design and compensation; introduction to sampled data systems. (Prerequisites: E.E. 353 and Math 302.)*

E.E. 481 3 Credits **Fall**
Electronics and Instrumentation for Scientists and Engineers I (2 + 3)
Theory and design of solid state electronic circuitry for practicing engineers and scientists in the physical and life sciences. Diodes, transistors, field effect transistors, integrated circuits, and other solid state devices. Analysis of modern electronic systems. (Prerequisites: 1 year of college physics; Corequisite: Math 200.)*

E.E. 482 3 Credits **Spring**
Electronics and Instrumentation for Scientists and Engineers II (2 + 3)
Instrumentation theory and concepts, transducers, data transmission, recording, and reducing. Digital electronics. Electrical measurement of physical variables and error analysis. (Prerequisite: E.E. 481 or equivalent.)*

E.E. 603 3 Credits **As Demand Warrants**
Advanced Electric Power Engineering (3 + 0)
Selected advanced topics in electric power generation, transmission, utilization, optimization, stability, and economics. (Prerequisite: E.E. 404 or equivalent.)*

E.E. 632 3 Credits **As Demand Warrants**
High Frequency Devices (3 + 0)
Principles of operation of microwave tubes, microwave semiconductor devices, parametric amplifiers, nonlinear elements, and ferromagnetics. (Prerequisite: E.E. 332.)*

E.E. 635 3 Credits **As Demand Warrants**
Advanced Electronic Circuit Design (3 + 0)
Low noise level design, networks for extraction of signals from noise, environmental design, and signal conditioning networks. (Prerequisite: E.E. 334.)*

E.E. 662 3 Credits As Demand Warrants
Communication Theory (3 + 0)
Generalized harmonic analysis, probability in communication systems, random variables, power spectral density, characterization of signals, sampling theory, detection, optimum filtering, coded systems, and channel models. (Prerequisite: E.E. 462.)*

Engineering Science

E.S. 101 2 Credits Fall and Spring
Graphics (1 + 4)
The first half of the semester will cover lettering, freehand drawing and sketching, proper use of drawing equipment, orthographic, isometric, oblique and perspective drawings, descriptive geometry, and graphic solutions. In the second half of the semester students will specialize in topics that are oriented to their individual discipline.

E.S. 111 3 Credits Fall and Spring
Engineering Science (1 + 4)
Engineering problem solving with emphasis on the statics, kinematics, and dynamics of engineering systems. Conservation laws, fluid mechanics, and heat. (Prerequisite: Credit or registration in Math. 107-108.)

E.S. 201 3 Credits Fall and Spring
Computer Techniques (2 + 3)
Basic computer programming, in both FORTRAN and BASIC, with considerable applications from all fields of engineering. (Prerequisite: Math 107-108 or enrollment in Math. 200.)

E.S. 208 4 Credits Fall and Spring
Mechanics (3 + 3)
A standard engineering-oriented coverage of statics and dynamics. Vector methods are used where appropriate. (Prerequisites: Math. 201 and either E.S. 111 or Phys. 211.)

E.S. 301 3 Credits Fall
Engineering Analysis (3 + 0)
Application of mathematical tools to engineering with emphasis on the mathematical formulation of typical engineering problems. Selected topics from all fields of engineering. (Prerequisite: Math. 302.)

E.S. 307 3 Credits Fall
Elements of Electrical Engineering (2 + 3)
Electrical fundamentals: elementary circuits and theorems, natural, forced and steady state response, principles of electronics, circuit models and system parameters, and characteristics of AC and DC machines. (Prerequisite: Math. 202, or permission of the instructor.)

E.S. 308 3 Credits Spring
Instrumentation and Measurement (2 + 3)
Instrumentation theory and concepts digital and analog, devices, transducers, data sensing transmission, recording, and display, instrumentation system, remote sensing, and hostile environmental conditions. (Prerequisite: E.S. 307.)

E.S. 331 3 Credits Fall and Spring
Mechanics of Materials (2 + 3)
A continuation of statics as applied to the analysis of internal forces in members subjected to axial, torsional, and flexural loads, singly and in combination. Stress-strain relationships and material property definitions; shear and moment diagrams, Mohr's Circle. Applications include beams, columns, connections, indeterminate cases. (Prerequisites: E.S. 208, Math. 201.)

E.S. 334 3 Credits Fall
Elements of Material Science/Engineering (2 + 3)
Introduction to properties of engineering materials, crystal structure, defect structure, structure and properties, aspects of metal processing, heat treatment, joining, testing, and failure analysis for engineering applications and design. (Prerequisites: Math. 201, Chem. 106 and Physics 212.)

E.S. 341 4 Credits Fall and Spring
Fluid Mechanics (3 + 3)
Statics and dynamics of fluids; energy and momentum principles, dimensional analysis; flow in open channels, closed conduits and around submerged bodies. (Prerequisites: E.S. 208, Math. 201.)

*Certain prerequisites may be waived by instructor under special circumstances.

E.S. 346 3 Credits Fall and Spring
Basic Thermodynamics (3 + 0)
Systems, properties, processes, and cycles. Fundamental principles of thermodynamics (first and second laws), and elementary applications. (Prerequisites: Math 201 and Phys. 211.)

Engineering and Science Management

E.S.M. 401 Credits Arr. Fall
Construction Cost Estimating and Bid Preparation (3 + 0)
Compilation and analysis of the many items that influence and contribute to the cost of projects to be constructed. Preparation of cost proposals and study of bidding procedures.

E.S.M. 450 3 Credits Spring
Economic Analysis and Operations (3 + 0)
Fundamentals of engineering economy, project scheduling, estimating, legal principles, professional ethics, and human relations. (Not offered for credit toward the Master of Science in Engineering Management or Science Management. Prerequisites: E.S. 201 and senior standing in engineering or permission of instructor.)

E.S.M. 605 3 Credits Fall
Engineering Economy (3 + 0)
The science of fiscal decision-making. Graduate level studies in problems of replacement, economic selections, income tax accounting, engineering evaluation, and introduction to the problems of depreciation.

E.S.M. 608 3 Credits Fall
Legal Principles for Engineering Management (3 + 0)
A course devoted to those aspects of law specifically related to technical management. Contracts, sales, real property, business organization, labor, patents, and insurance. (Prerequisites: Graduate standing.)

E.S.M. 609 3 Credits Alternate Fall
Project Management (3 + 0)
Organizing, planning, scheduling and controlling projects. Use of CPM and PERT computer applications. Case studies of project management problems and solutions. (Prerequisite: Graduate standing in Engineering Management or permission of instructor. Next offered: 1985-86.)

E.S.M. 611 3 Credits Fall
Accounting for E.S.M. (3 + 0)
Review of accounting principles: industrial accounting including cost accounting, business organization, business finance, and, emphasis on use of data in management rather than its generation.

E.S.M. 612 3 Credits Spring
Finance for E.S.M. (3 + 0)
Development of ability to seek out needed information, analyze it, and make recommendations over a wide range of managerial problems involving fiscal matters: cases involving capital acquisitions, profit maximization, methods improvement, pricing, modification of controls, and other management problems. (Prerequisites: E.S.M. 605, 611.)

E.S.M. 613 3 Credits Spring
Personnel for E.S.M. (3 + 0)
Human element in management: labor relations, human relations, personnel administration, industrial psychology, employee relations, and labor economics from the viewpoint of needs of a manager.

E.S.M. 621 3 Credits Spring
Operations Research (3 + 0)
Mathematical techniques for aiding managerial decision-making. Waiting line theory, inventory models, linear programming, transportation problem, dynamic programming, PERT/CPM, machine scheduling, and simulation. Emphasis on application of techniques to actual management situations.

E.S.M. 623 3 Credits Fall and Spring
Computer Programming for Engineering Managers (3 + 0)
A course in basic FORTRAN programming, with applications to engineering management problems. (Not offered for credit toward the Master of Science in Engineering Management or Science Management.)

E.S.M. 684 3 Credits Spring and Fall
Engineering Management Project (3+0)
Individual study of an actual engineering management problem resulting in a report which includes recommendations for action.

English

Note: In the list below, courses which are offered only every other year are indicated by the specific year in which they are next scheduled. Courses with no year scheduled are offered every year, except as noted.)

Engl. 100 3 Credits Fall and Spring
Elementary English (3+0)
For students inadequately prepared for Engl. 111. Intensive practice in written comprehension. Frequent writing assignments. Not to be substituted for required courses. (Prerequisite: Placement examination or student desire to enroll.)

Engl. 111 3 Credits Fall and Spring
Methods of Written Communication (3+0)
Instruction in writing expository prose, including principles of order and clarity. Close analysis of appropriate texts. Introduction to research techniques. (Prerequisite: Placement examination or English 100.)

Engl. 211 3 Credits Fall and Spring
Intermediate Exposition, with Modes of Literature (3+0)
Instruction in writing through close analysis of literature. Research paper required. (Prerequisites: Sophomore standing and completion of Engl. 111 or its equivalent.)

Engl. 213 3 Credits Fall and Spring
Intermediate Exposition (3+0)
Instruction in writing through close analysis of expository prose from the social and natural sciences. Research paper required. (Prerequisites: Sophomore standing and completion of Engl. 111 or its equivalent.)

NOTE: Neither English 211 nor English 213 is to be considered or is to be used as a prerequisite for any other course or for any particular course of study. Because both of these courses will be primarily courses in writing, either one of them will fulfill the second half of the requirement in written communication for the baccalaureate degree. A student who has taken one of these courses before declaring a major in which the other course may be considered more appropriate, or a student who changes major from a field in which one of these courses is considered more appropriate than the other, will not be required to take the other course.

Engl. 215 3 Credits Fall
Introduction to Poetry (3+0) h
Analysis and appreciation of the various kinds of writing in verse (lyric, narrative, and other poetry), including the terminology used to describe poetic techniques. (Prerequisite: Engl. 111 or permission of instructor.)

Engl. 216 3 Credits Fall and Spring
Introduction to Fiction (3+0) h
Analysis and appreciation of selected novels and short stories, including the terminology used to describe fictional techniques. (Prerequisite: Engl. 111 or permission of instructor.)

Engl. 218 3 Credits Spring
Themes in Literature (3+0) h
Exploration of literary themes in various genres of literature, including fiction, poetry and drama. Specific content to be announced at time of registration. (Prerequisite: Engl. 111 or permission of instructor.)

Engl. 230 3-7 Credits Fall
English Language Proficiency (3+3-6+3+1)
Engl. 231 3-7 Credits Spring
English Language Proficiency (3+3-6+3+1)
Intensive drill in listening to, speaking, reading, and writing the English language. Especially recommended for all students for whom English is a foreign language. These courses do not meet general degree requirements in written communications and are not classified as humanities. (Prerequisite: Open only to students for whom English is a foreign language. Permission of instructor required.)

Engl. 271 3 Credits Fall and Spring
Introduction to Creative Writing (3+0) h
Course for beginning students who have no or little experience in expressing themselves creatively in poetry, fiction, and drama. Class discussion of student work, conferences with teacher. Study of form and technique of major writers. (Prerequisite: Engl. 111 or permission of instructor.)

Engl. 301 3 Credits Fall
Continental Literature in Translation: From the Ancient World through the Renaissance (3+0) h
Readings in Greek plays, *The Iliad*, *The Aeneid*, Bible, Dante: the classical background out of which the western literary tradition has sprung. (Prerequisite: Engl. 111 or permission of instructor.)

Engl. 302 3 Credits Alternate Spring
Continental Literature in Translation: From the Age of Reason to the Present (3+0) h
The study of literary, philosophical, and aesthetic ideas of western man as reflected in his/her literature. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1986-87.)

Engl. 306 3 Credits Alternate Fall
Survey of American Literature: From the Colonial Period to the Civil War (3+0) h
Comprehensive study of American thought as reflected in its major writers, including works representative of American Calvinism, Rationalism, Transcendentalism, and Romanticism. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1985-86.)

Engl. 307 3 Credits Alternate Spring
Survey of American Literature: From the Civil War to the Present (3+0) h
Comprehensive study of American thought as reflected in its major writers, including works representative of Realism, Naturalism, Stream-of-Consciousness, and Surrealism. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1985-86.)

Engl. 308 3 Credits Alternate Fall
Survey of British Literature: Beowulf Through the 18th Century Period (3+0) h
Survey of writers and works in Old and Middle English, including Chaucer, through the Elizabethan period (Shakespeare), the Restoration, and the Neoclassic Period of the 18th Century. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1986-87.)

Engl. 309 3 Credits Alternate Spring
Survey of British Literature: Romantic Period to the Present (3+0) h
Survey of writers and works from the early Romantic Period (Blake and Burns), through the Victorian period, James Joyce, and Stream-of-Consciousness, to the present. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1986-87.)

Engl. 310 3 Credits Spring
Literary Criticism (3+0) h
Introduction to the history and principles of literary criticism, from the earliest days to the end of the 19th century. (Prerequisite: Engl. 111 or permission of instructor.)

Engl. 311 3 Credits Fall and Spring
Advanced Exposition (2+0+1) h
Instruction in writing for students who wish to develop proficiency in organizing and composing essays on factual material in which they have genuine interest. Research paper required. Course will fulfill the second half of the requirement in written communication (i.e., it may replace Engl. 211 or Engl. 213). (Prerequisite: Junior standing, Engl. 111 or its equivalent, or permission of instructor.)

Engl. 312 3 Credits Fall and Spring
Technical Writing (2+0+1) h
Instruction in writing business letters (letters of inquiry, complaint, evaluation, and job application with resume) and in preparing tables, graphs, process descriptions, technical instructions, abstracts, grant proposals, and technical reports (progress, laboratory, survey, incident, inspection, feasibility, and research reports). Course will fulfill the second half of the requirement in written communication (i.e., it may replace Engl. 211 or 213). (Prerequisites: Junior standing and Engl. 111 or its equivalent or permission of instructor).

Engl. 318 3 Credits Fall
Modern English Grammar (3+0) h
Study of the structure of current English as seen through traditional and contemporary grammatical theories. (Prerequisite: English 111 or permission of instructor.)

Engl. 349 3 Credits Fall
Aleut, Eskimo, and Indian Literature of Alaska in English Translation (3+0) h
Survey of the folklore of Alaska's native peoples, including bibliography of published collections, systems of classifying the stories, and study and appreciation of selected stories representing all major Native languages. (Prerequisite: Engl. 111 or permission of instructor.)

Engl. 350 3 Credits Spring
Frontier Literature of Alaska (3+0) h
Study of representative works of fiction, verse, and non-fiction which deal with the "early days" of the Territory of Alaska. (Prerequisite: Engl. 111 or permission of instructor.)

Engl. 371 3 Credits Fall
Creative Writing (3+0) h
Practice and guidance in writing fiction, poetry, drama, and essays. Students' work will be read and discussed in class and in conference with the instructor. Close study of the techniques of established writers. (Prerequisite: Engl. 111 and Engl. 271 or permission of instructor.)

Engl. 403 3 Credits Every Third Spring
American Writers of the 19th Century: Romantic Period (3+0) h
Study of authors whose works gave shape to American thinking and writing, transcendentalism and early symbolism. Authors to include (but not limited to): Cooper, Hawthorne, Poe, Emerson, Thoreau, Melville, Whitman, and Dickinson. (Prerequisite: Engl. 111 or permission of instructor. Engl. 306 desirable but not required. Next offered: 1986-87.)

Engl. 404 3 Credits Every Third Spring
American Writers of the 19th Century: Rise of Realism (3+0) h
Study of authors between the Civil War and 1914, who pioneered realism and naturalism; authors to include (but not limited to): Twain, Howells, James, Garland, Crane, Norris, London, and Wharton. (Prerequisite: Engl. 111 or permission of instructor. Engl. 307 desirable but not required. Next offered: 1986-87.)

Engl. 405 3 Credits Every Third Fall
British Writers of the 19th Century: Romantic Period (3+0) h
The surge of romanticism in England produced some of the world's great literary works. Authors to include (but not limited to): Byron, Keats, Shelley, Coleridge, Wordsworth, Austen, the Bronte sisters, and Scott. (Prerequisite: Engl. 111 or permission of instructor. Engl. 308 desirable but not required. Next offered: 1986-87.)

Engl. 406 3 Credits Every Third Fall
British Writers of the 19th Century: Victorian Period (3+0) h
Study of the impact of industrialization, social reformation, religious controversy, and philosophical attitudes on literature. Authors to include (but not limited to): Browning, Tennyson, Thackeray, Eliot, Arnold, Dickens, Hazlitt, Ruskin, and Meredith. (Prerequisite: Engl. 111 or permission of instructor. Engl. 309 desirable but not required. Next offered: 1985-86.)

Engl. 407 3 Credits Every Third Fall
English Writers of the 18th Century: Restoration and Neo-Classical Period (3+0) h
Study of the revival of British drama, the age of satire, the rise of the essay, new directions in biography, the beginnings of modern prose, and new thoughts about criticism. Authors to include but not limited to: Dryden, Pope, Swift, Addison, Steele, Goldsmith, Sheridan, Boswell, and Johnson. (Prerequisites: Engl. 111 and junior standing or permission of instructor. Engl. 308 recommended but not required. Next offered: 1986-87.)

Engl. 408 3 Credits Every Third Spring
American Writers of the Colonial and Federal Periods. (3+0) h
Study of the writers of the earliest period of American history who contributed to the development of a national literary identity. Authors to include but not limited to: Bradstreet, Taylor, Mather, Edwards, Franklin, Paine, Brackenridge, Tyler, and Irving. (Prerequisites: Engl. 111 and junior standing or permission of instructor. Engl. 306 recommended but not required. Next offered: 1985-86.)

Engl. 414 3 Credits Spring
Research Writing (3+0) h
Practice in reporting primary and secondary research in the forms and styles appropriate to the student's field. Weekly conference required. Preference given to seniors. (Prerequisite: Engl. 111 and 211 or 213 or 311 or their equivalent.)

Engl. 421 3 Credits Alternate Spring
Chaucer (3+0) h
Major poetry, with emphasis on *The Canterbury Tales*, and survey of Chaucerian criticism. (Prerequisite: Engl. 111 or permission of instructor; Engl. 308 desirable but not required. Next offered: 1986-87.)

Engl. 422 3 Credits Fall
Shakespeare: History Plays and Tragedies (3+0)
Major chronicle plays and tragedies, including significant criticism. (Prerequisite: Engl. 111 or permission of instructor. Engl. 308 desirable but not required.)

Engl. 425 3 Credits Spring
Shakespeare: Comedies and Non-Dramatic Poetry (3+0) h
Major comedies and non-dramatic poems, including significant criticism. (Prerequisite: Engl. 111 or permission of instructor. Engl. 308 desirable but not required.)

Engl. 426 3 Credits Alternate Spring
Milton (3+0) h
Major poetry and prose, and survey of Miltonian criticism. (Prerequisite: Engl. 111 or permission of instructor; Engl. 308 desirable but not required. Next offered: 1985-86.)

Engl. 444 3 Credits Alternate Spring
European Literature (3+0) h
Studies in major European writers and periods. (Prerequisite: Engl. 111 or permission of instructor; Engl. 301 and 302 desirable but not required. Next offered: 1985-86.)

Engl. 445 3 Credits Alternate Fall
20th-Century Drama: From Chekhov to Ionesco (3+0) h
The major dramatists and their achievements. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1986-87.)

Engl. 446 3 Credits Alternate Spring
20th-Century British and American Poetry (3+0) h
The major achievements in modern poetry, including the work of Yeats, Eliot, Pound, Lowell, Roethke, and Stevens, among others. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1985-86.)

Engl. 447 3 Credits Alternate Spring
20th-Century British Literature, Exclusive of Poetry (3+0) h
Fiction, drama, essays, and criticism of the major writers, including Joyce, Shaw, Woolf, Lawrence, and Orwell, among others. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1985-86.)

Engl. 448 3 Credits Alternate Spring
20th-Century American Literature, Exclusive of Poetry (3+0) h
Fiction, drama, essays, and criticism of the major writers. Comprehensive readings in selected authors. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1986-87.)

Engl. 449 3 Credits Alternate Fall
American Fiction to 1900 (3+0) h
Study of the development of the American novel and short story from their earliest foreshawdowings in captivity narratives through the gothic, the romance, symbolism and allegory, and realism and naturalism. Authors to include but not limited to: Rowlandson, Brown, Cooper, Hawthorne, Poe, Melville, de Forest, Twain, Howells, James, Norris, Dreiser. (Prerequisites: Engl. 111 and junior standing or permission of instructor. Engl. 306, 307, 403, 404, 408 recommended but not required. Next offered: 1986-87.)

Engl. 452 3 Credits Alternate Fall
The British Novel to 1900 (3+0) h
Origin and development of the novel with concentration on significant novelists from Daniel Defoe to Thomas Hardy. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1985-86.)

Engl. 462 3 Credits Alternate Spring
Applied English Linguistics (3+0) h
The topic(s) for each offering of the course will be announced. Examples are teaching English as a second language, dialects and education, dictionaries, stylistics, and composition. (Prerequisite: English 111 or permission of instructor. Next offered: 1985-86.)

Engl. 472 3 Credits Alternate Spring
History of the English Language (3+0) h
Origin and development of the English language from prehistoric times to the present. (Prerequisite: Engl. 111 or permission of instructor. Engl. 318 or a linguistics course is desirable, but not required. Next offered: 1986-87.)

Engl. 481 3 Credits Alternate Fall
Craft of Poetry (3+0) h
Intensive study and practice of the forms and techniques of poetry; analysis of selected poems and consideration of selected criticism. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1986-87.)

Engl. 482 3 Credits Alternate Spring
Craft of Fiction (3+0) h
Intensive study and practice of the forms and techniques of fiction; analysis of selected stories and consideration of selected criticism. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1985-86.)

Engl. 483 3 Credits Alternate Spring
Craft of Drama (3+0) h
Intensive study and practice of the forms and techniques of drama; analysis of selected plays and consideration of selected criticism. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1985-86.)

Engl. 484 3 Credits Alternate Spring
Craft of Non-Fiction Prose (3+0) h
Intensive study and practice of the forms and techniques of non-fiction prose; analysis of selected works and consideration of selected criticism. (Not a workshop. See J-B. 420 for a course in writing biography and autobiography, for which this course may serve as preparation.) (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1986-87.)

Engl. 601 3 Credits Fall
Bibliography, Methods, and Criticism (3+0)
A study of the basic reference works for research in literature, the methods for conducting research, and the principles of literary criticism. (Prerequisite: Graduate standing or permission of instructor.)

Engl. 603 3 Credits Every Third Fall
Studies in British Literature: Old and Middle English (3+0)
Variable subject matter in significant topics in Anglo-Saxon and Middle English literature. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1986-87.)

Engl. 604 3 Credits Every Third Fall
Studies in British Literature: Renaissance and 17th Century (3+0)
Variable subject matter in significant topics in 16th and 17th-Century British Literature. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1985-86.)

Engl. 607 3 Credits Every Third Spring
Studies in British Literature: Restoration, 18th and 19th Centuries (3+0)
Variable subject matter in significant topics in British literature of the Augustan, Romantic, and Victorian periods. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1986-87.)

Engl. 608 3 Credits Every Third Spring
Studies in British Literature: 20th Century (3+0)
Variable subject matter in significant topics in modern British literature. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1985-86.)

Engl. 609 3 Credits Every Third Spring
Studies in American Literature: Colonial Period and 19th Century (3+0)
Variable subject matter in significant topics in American literature to the end of the 19th Century. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1985-86.)

Engl. 612 3 Credits Every Third Fall
Studies in American Literature: 20th Century (3+0)
Variable subject matter in significant topics in modern American literature. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1986-87.)

Engl. 670 3 Credits Every Third Semester
Studies in Comparative Literature (3+0)
Variable subject matter in significant topics in comparative literature. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1985-86.)

Engl. 671 Credits Arr. Fall and Spring
Writers' Workshop
The writing of verse, fiction, drama, or non-fiction prose in accordance with the individual student's needs and the instructor's specialization. Depending on available staff, the workshop may be limited during any semester to work in a particular genre. May be taken twice for a maximum of six credits. (Prerequisites: At least two courses from among Engl. 481, 482, 483, 484 and permission of instructor; or, permission of the head of Department of English and of instructor.)

Engl. 681 3 Credits Alternate Fall
Forms of Poetry (3+0)
Intensive study of the forms and techniques of poetry writing. Includes readings and poetry writing exercises. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1985-86.)

Engl. 682 3 Credits Alternate Fall
Forms of Fiction (3+0)
Advanced study in narrative technique through analysis of selected fiction and the students' own writing. Variable content in terms of the writers to be studied, and the kinds of narrative writing to be assigned. (Prerequisite: Graduate status or permission of instructor. Next offered: 1986-87.)

Engl. 683 3 Credits Alternate Spring
Forms of Drama (3+0)
Advanced study in dramatic technique through analysis of selected plays and the students' own writing. Variable content in terms of the playwrights to be studied, and the kinds of dramatic writing to be assigned. (Prerequisite: Graduate status or permission of instructor. Next offered: 1986-87.)

Engl. 684 3 Credits Alternate Spring
Forms of Non-Fiction Prose (3+0)
Intensive study of the forms and techniques of non-fiction. Includes readings and writing exercises. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1985-86.)

Engl. 685 3 Credits Fall
Teaching College Composition (3+0)
An investigation into current practice and theory with demonstrations and reports on pedagogy. Required of all teaching assistants in English. (Prerequisite: Graduate standing.)

Environmental Quality Engineering/ Science

EQS 201 3 Credits Fall
Environmental Protection (3 + 0)
The study of pollution control and abatement with emphasis on air, water and land pollution; health protection; and environment impact. Other topics to be presented include pesticides, hazardous wastes, radioactive wastes, energy, population control, ecology and environmental law. This course wil supplement and complement ALR 101 - Conservation of Natural Resources.

EQE 601 3 Credits Every Third Semester
Environmental Quality Science Measurements (2 + 3)
Theory and laboratory procedures for determining quality of water supplies. Natural water quality, pollution loads, and water and waste-water treatment plant parameters. Familiarization with *Standard Methods for the Examination of Water and Waste-water*. Experiments on unit processes of treatment systems are included along with consideration for solid waste air pollution monitoring. (Prerequisite: Permission of instructor. Next offered: Fall 1985.)

EQE 602 3 Credits Every Third Semester
Engineering Management of Water Quality (3 + 0)
Concepts, rationale, theory, institutions, and engineering aspects of water quality management. Methods of water quality management: low flow augmentation, in-stream aeration, stream and estaurine analysis, ocean disposal systems, land disposal, control of thermal effluents, industrial discharges, and arctic applications. (Prerequisite: Permission of instructor. Next offered: Spring 1986.)

EQE 603 3 Credits Every Third Semester
Solid Waste and Air Pollution (3 + 0)
Planning, collecting, and disposing of refuse. Techniques of open dumping, land filling, sanitary land filling, composting, incineration, and resource recovery. Solid waste environmental relationships to water, air, and land pollution. Economics and case studies are included. Air pollution topics will include quantity and quality of atmospheric emissions and their effects on man and his environment. Identification and location of sources, and measurement of quality and standards. (Prerequisite: Permission of instructor. Next offered: Fall 1985.)

EQE 604 3 Credits Every Third Semester
Environmental Quality Evaluation (3 + 0)
Topics of environmental impact statements, environmental law (local, state and federal), and environmental quality. Impact from projects of mining, highways, airports, pipelines, industrial development, water, wastewater and solid waste, and others - theoretical considerations and case studies. (Prerequisite: Graduate standing or permission of the instructor. Next offered: Spring 1986.)

EQE 605 3 Credits Every Third Semester
Chemical and Physical Water and Wastewater Treatment Processes (3 + 0)
The theory and design of chemical and physical unit processes utilizing the treatment of water and wastewater. Sedimentation and flotation, ion exchange, adsorption, coagulation, precipitation, filtration, disinfection, reverse osmosis, and aeration theories will be studied. Design problems for all unit processes. (Prerequisite: Graduate standing or permission of the instructor. Next offered: Spring 1986.)

EQE 606 3 Credits Every Third Semester
Biological Treatment Processes (3 + 0)
Study of the theoretical and applied aspects of wastewater treatment by biological processes including activated sludge, trickling filters, lagoons, sludge digestion and processing, septic tanks, analysis and design, nutrient removal processes, biology of polluted waters, economics, state, and federal regulations. (Prerequisite: Graduate standing or permission of the instructor. Next offered: 1985.)

Eskimo

Esk. 101 5 Credits Fall
Esk. 102 5 Credits Spring
Elementary Yup'ik Eskimo (5 + 0) h
Introduction to Central Yup'ik, the language of the Yukon and Kuskokwim deltas and Bristol Bay. Open to both speakers and nonspeakers. For speakers the course provides literacy and grammatical analysis. For others, it provides a framework for learning to speak, read, and write the language. Consideration given to dialect differences.

Esk. 108 3 Credits Spring
Yup'ik Literacy (3 + 8)
Literacy training for speakers of Yup'ik languages (Central Yup'ik, St. Lawrence Island Yup'ik, and Alutiiq). Learning to read and write the language.

Esk. 111 5 Credits Fall
Esk. 112 5 Credits Spring
Elementary Inupiaq Eskimo (5 + 0) h
Introduction to Inupiaq, the language of Unalakleet, Seward Peninsula, Kotzebue Sound, and North Slope. Open to both speakers and nonspeakers. For speakers the course provides literacy and grammatical analysis. For others it provides a framework for learning to speak, read, and write the language. Consideration given to dialect differences.

Esk. 118 3 Credits Spring
Inupiaq Literacy (3 + 0)
Literacy training for speakers of Alaskan Inupiaq. Learning to read and write the language.

Esk. 201 3 Credits Fall
Esk. 202 3 Credits Spring
Intermediate Yup'ik (3 + 0) h
Continuation of Eskimo 101-102. Increasing emphasis on speaking, reading, and writing.

Esk. 211 3 Credits Fall
Intermediate Inupiaq Eskimo (3 + 0) h
Continuation of Elementary Inupiaq Eskimo, concentrating on development of conversational ability, with presentation of additional grammar and vocabulary. (Prerequisites: Completion of Elementary Inupiaq Eskimo 111 and 112 or permission of instructor.)

Esk. 212 3 Credits Spring
Intermediate Inupiaq Eskimo (3 + 0) h
Continuation of Intermediate Inupiaq Eskimo, Esk. 211, concentrating on development of conversational ability with presentation of additional grammar and vocabulary. (Prerequisites: Completion of Elementary Inupiaq Eskimo 111-112, and Esk. 211, or permission of instructor.)

Esk. 301 3 Credits Fall
Advanced Yup'ik Eskimo (3 + 0) h
Continuation of Esk. 201-202. Completes the basic study of the Yup'ik grammar. (Prerequisites: Esk. 101, 102, 201-202 or permission of instructor.)

Esk. 415 3 Credits Spring
Additional Topics in Advanced Yup'ik Eskimo (3 + 0) h
Further study of Yup'ik linguistics. Includes text transcription, editing, analysis, and discussion. Yup'ik dialectology. Study of related Eskimo languages from the standpoint of Central Yup'ik. Additional topics to be studied depending upon the interests of the students and the instructor. (Prerequisites: Esk. 101, 102, 201-202, 203 or permission of instructor.)

Esk. 417 3 Credits Spring
Advanced Inupiaq Eskimo (3 + 0) h
Advanced study in Inupiaq Eskimo. A continuation of Esk. 212. (Prerequisites: Completion of Esk. 111, 112, 211, 212 or permission of instructor.)

Foreign Languages

F.L. 110 2 Credits Every Third Spring
How to Pronounce French, German, Italian, and Spanish (2+0)
Designed to meet the needs of students and others in radio, television, journalism, drama, music (esp. voice), etc. who want to pronounce French, German, Italian and Spanish correctly and with confidence. The method is practical and direct. Concrete examples are used. (Next offered: 1985-86.)

French

(For UAF program in France, see p. 63)

Fren. 101 5 Credits Fall
Fren. 102 5 Credits Spring
Elementary French I and II (5+0) h
Introduction to the language and culture: development of competence and performance in the language through understanding, recognition and use of linguistic structures, increasing emphasis on listening comprehension and speaking, basic vocabulary of approximately 1,000 words, exploration of the cultural dimension, implicitly through language, and explicitly through texts and audio-visual materials; use of Foreign Language Learning Center.

Fren. 201 3 Credits Fall
Fren. 202 3 Credits Spring
Intermediate French I and II (3+0) h
Continuation of Fren. 102. Increasing emphasis on reading ability and culture material. Conducted in French. (Prerequisite: Fren. 102 or equivalent.)

Fren. 288 2 Credits Spring
Individual Study: Reading French h
Emphasis on rapid expansion of passive vocabulary and immediate recognition of frequent idiomatic expressions and grammatical structures, development of true reading skills, modern literary and/or non-literary texts. (Prerequisites: Fren. 201, equivalent training or permission of instructor. Recommended to be taken concurrently with Fren. 202.)

Fren. 301 3 Credits Alternate Fall
Fren. 303 3 Credits Alternate Fall
Advanced French (3+0) h
Discussions and essays on more difficult subjects or texts, and translations, stylistic exercises, and special grammatical problems. Conducted in French. (Prerequisite: Fren. 202 or equivalent. Fren. 301 next offered: 1985-86; Fren. 303: 1986-87.)

Fren. 387 2 Credits Alternate Fall
Individual Study: Semantics h
Systematic expansion of passive and active vocabulary through analysis of word fields, series of synonyms and antonyms, principles of word formation, derivation, composition, etc. Conducted in French. (Prerequisites: Fren. 202 or permission of instructor. Next offered: 1985-86.)

Fren. 432 3 Credits Spring
Studies in French Literature and Culture (3+0) h
Intensive study of authors, literary movements, periods, and/or genres. Analysis of cultural material other than texts. Conducted in French. Student may repeat course for credit when topics vary. (Prerequisites: French 301 or 303 or equivalent and at least sophomore standing, or permission of instructor.)

Fren. 487 2 Credits Alternate Fall
Individual Study: Translation of French Texts h
Expansion of vocabulary and grammatical knowledge, emphasis on understanding precise shades of meaning, stylistics, artistic expression and cultural values in language, and literary and non-literary texts. Student may repeat course for credit if materials vary. Conducted in French. (Prerequisites: Fren. 301 or 303 or equivalent and at least sophomore standing, permission of instructor. Next offered: 1986-87.)

Fren. 488 3 Credits As Demand Warrants
Individual Study: Senior Project h
Designed to permit the student to demonstrate ability to work with the language and the culture through the analysis and presentation, in the language, of a problem chosen by the student in consultation with the department. The student must apply for senior project and submit a project outline by the end of the 6th week of the semester preceding the semester of graduation. Conducted in French. (Prerequisites: At least 10 credits in upper division French or permission of instructor.)

Geography

Geog. 101 3 Credits Fall and Spring
Introductory Geography (3+0) s
World regions, an analysis of environment, with emphasis on major culture realms.

Geog. 103 3 Credits Fall
World Economic Geography (3+0) s
Study of the world's major economic activities: their physical and cultural bases, spatial growth and distribution patterns, and their significance in interregional and international development.

Geog. 202 3 Credits Alternate Fall
Geography of United States and Canada (3+0) s
Regional geography of Anglo-America. Introductory systematic study of the area as a whole, followed by detailed study of the physical and cultural landscape forms, patterns, and associations of each major region in turn. Consideration of Anglo-America in current world economic and political geography. (Next offered: 1985-86.)

Geog. 205 3 or 4 Credits Fall and Spring
Elements of Physical Geography (3+0 or 3+3) n
Analysis of the processes that form the physical environment and the resulting physical patterns. Study of landforms, climate, soils, water resources, vegetation, and their world and regional patterns. Optional laboratory for one additional credit. (Prerequisite: Geog. 101 or 103.)

Geog. 301 3 Credits As Demand Warrants
Geographic Field Research Techniques
Theory and application of geographic methods of conducting field investigations. Collection, analysis, synthesis, and interpretation of data concerning the natural and man-made features of regional environments. Preparation and presentation of reports of findings and conclusions. (Permission of instructor.)

Geog. 302 3 Credits Fall and Spring
Geography of Alaska (3+0) s
Regional, physical and economic geography of Alaska. Special consideration of the state's renewable and nonrenewable resources, and of plans for their wise use. Frequent class study of representative maps and visual materials. (Prerequisite: Geog. 101 and 205.)

Geog. 305 3 Credits Alternate Fall
Geography of Europe (except U.S.S.R.) (3+0) s
Regional, physical, economic and cultural geography of Europe, except U.S.S.R. (Prerequisite: Geog. 101 and 205. Next offered: 1985-86.)

Geog. 306 3 Credits Alternate Spring
Geography of the Soviet Union (3+0) s
The physical, cultural and historical geography of the U.S.S.R. with special emphasis on the geographic bases of the expansion of the Great Russians and the contemporary foundation of Soviet national power. (Prerequisite: Geog. 101 or 103 or 205 or permission of the instructor. Next offered: 1986-87.)

Geog. 309 3 Credits As Demand Warrants
Cartography (1+6) s
Graphic techniques for presenting geographic data through the construction of maps, projections and charts. (Prerequisite: Permission of instructor.)

Geog. 311 3 Credits **Alternate Fall**
Geography of Asia (3+0) s
Regional geography of Asia, exclusive of the Soviet Union. A study of the physical framework, natural resources, peoples, major economic activities, and characteristic landscapes of the major regions of Japan, China, Southeast Asia, India-Pakistan, and the Asiatic countries of the Middle East. (Prerequisite: Geog. 101 or 103 or 205 or permission of the instructor. Next offered: 1986-87.)

Geog. 315 3 Credits **As Demand Warrants**
Geography of Africa (3+0) s
Physical and cultural geography of Africa, by regions. Significance of Africa in current world cultural, economic, and political geography. Major emphasis on regions south of the Sahara. (Prerequisite: Geog. 101 and 205.)

Geog. 327 3 Credits **Spring**
Cold Lands (3+0) s
The comparative physical, human, and economic geography of cold regions, with particular attention to Siberia, Greenland, Scandinavia and Canada. Special attention is given to the different approaches which have been taken toward economic development in cold regions. (Prerequisite: Geog. 101 or 103 or 205 or permission of the instructor.)

Geog. 339 3 or 4 Credits **Alternate Spring**
Advanced Physical Geography (3+0) or (3+3) n
Application of methodology of physical geography to analysis of regional landscapes. Optional laboratory for one additional credit. (Prerequisites: Geog. 101 or 103, 205. Next offered: 1986-87.)

Geog. 401 3 Credits **Alternate Fall**
Weather and Climate (3+0) n
Introduction to the study of weather and classification of climates. (Prerequisite: permission of the instructor. Next offered: 1986-87.)

Geog. 402 3 Credits **Alternate Spring**
Man and Nature (3+0) s
The relationship of man with the land he occupies, study of the physical environment and human occupation of the world's major regions, consideration of the significance of cultural diversity, differing patterns of livelihood, settlement, and population change. (Prerequisite: Geog. 101 and 205. Next offered: 1985-86.)

Geog. 404 3 Credits **Alternate Spring**
Urban Geography (3+0) s
A world survey of urbanization with particular emphasis on the accelerating urban revolution in modern times. Conditions favoring the rise of cities: locational and site factors, regional and interregional resource availability, and human factors. Changing functions and patterns of urban areas. National and international problems inherent in trends toward a predominantly urbanized economy and culture. Implications of urbanization in Alaska. (Prerequisite: Geog. 101. Next offered: 1985-86.)

Geog. 405 3 Credits **Alternate Fall**
Political Geography (3+0) s
Geographical analysis of the evolution, structure, internal coherence, and sources of strength of individual nation states, with emphasis on nations of the Pacific realm and Arctic periphery. Consideration of regional blocs, spheres of influence, and potential for international cooperation. (Prerequisite: Geog. 101. Next offered: 1986-87.)

Geog. 408 3 Credits **As Demand Warrants**
Quantitative Research Techniques (2+3)
Philosophy and methodology in geography. Theories, laws, and models for measurement, analysis and explanation of geographic patterns and associations. Applications of findings to solution of geographic problems. (Prerequisites: Junior standing and college-level mathematics, or permission of the instructor.)

Geological Engineering

G.E. 101 1 Credit **Fall**
Introduction to Geological Engineering (1+0)
An introduction to the many facets of geological engineering as a profession, the area and scope of the field. Graded pass/fail.

G.E. 261 3 Credits **Spring**
General Geology for Engineers (2+3)
(Same as Geos. 261)
Introduction to applied geology: study of common rocks and minerals, landforms, erosion, transport and deposition of geologic materials, and engineering applications of geology. (Prerequisite: Geology, science, and engineering majors, or permission of instructor.)

G.E. 262 3 Credits **Fall**
Mineralogy and Petrology for Engineers (2+3)
(Same as Geos. 262)
Principles and practice of classification and description of common rock, ore and soil forming minerals; principles and practice of classification and description of rocks, ores and soils commonly encountered in mining and geotechnical engineering. Physiochemical, genetic, environmental, economic and engineering aspects are considered. Course may not be used to satisfy degree requirements in Geology and Geological Engineering. (Prerequisites: G.E./Geos. 261 or Geos. 101.)

G.E. 365 3 Credits **Fall**
Geological Engineering I (3+0)
A detailed and quantitative study of the geological and geotechnical factors for the solution of engineering problems. Special emphasis on the soil engineering designs related to excavations, foundations, earth-retaining structures, and soil slopes. (Prerequisites: eos. 101 or Geos./G.E. 261 and E.S. 208.)

G.E. 372 3 Credits **Spring**
Rock Engineering (3+0)
The application of geologic principles to rock engineering problems related to underground excavation, slope design, and strata control. Both qualitative and quantitative aspects considered. Some field work required. (Prerequisites: Geos. 101 or Geos./G.E. 261 and E.S. 208.)

G.E. 375 3 Credits **Fall**
Terrain Analysis (3+0)
The techniques used to compile terrain characteristics and terrain qualities are presented. Basic geomorphic and engineering principles are studied with consideration being given to Alaskan problems and applications. (Prerequisites: G.E./Geos. 261 or Geos. 101.)

G.E. 405 4 Credits **Spring**
Exploration Geophysics (3+3)
Introduction to the theory and application of gravity, magnetic, electrical, electro-magnetic, radioactive, and seismic methods as used for geophysical exploration. Some field work required. (Prerequisites: Math. 200 and Phys. 211 or equivalent.)

G.E. 420 3 Credits **Spring**
Subsurface Hydrology (2+3)
Theory and engineering concepts of the movements of subsurface fluids. Study of hydraulic characteristics of earth materials, engineering problems related to subsurface fluids, and properties of water. Flow net constructions by analog methods and computer simulation. (Prerequisites: G.E./Geos. 261 and Phys. 211.)

G.E. 431 2 Credits **Alternate Fall**
Applied Ore Microscopy (1+3)
Preparation of polished sections of ores. Identification of ore minerals in reflected light by physical, optical, and chemical methods. Applications to ore genesis, drill core interpretation, beneficiation, and process control. (Prerequisite: Geos. 213 or permission of the instructor. Next offered: 1986-87.)

G.E. 435 3 Credits **Spring**
Exploration Design (3+0)
Geologic, engineering, and economic considerations applied to the design and development of mineral exploration programs. (Prerequisites: Geos. 314 and Geos. 214 or permission of instructor.)

G.E. 440 3 Credits **Alternate Spring**
Slope Stability (3+0)
Slope design for open pit mining and other excavations. Stability analysis by various methods and on-site measuring and monitoring techniques. (Prerequisites: E.S. 331 or permission of instructor. Next offered: 1985-86.)

G.E. 471 3 Credits Spring
Remote Sensing for Engineering (3+0)
The applications of remote sensing to engineering problems such as exploration, site selection, and reclamation are presented with the basic principles of remote sensing techniques. An introduction to remote sensing systems is included with primary consideration being given to Alaskan problems and applications. (Prerequisites: Geos. 101 or Geos./G.E. 261, Geos. 408, Physics 212.)

G.E. 480 2 Credits Spring
Geological Engineering II (1+3)
A detailed and quantitative study of the geological and engineering factors for the solution of classical engineering problems with special emphasis on geological engineering designs. Project presentation to the class will be required. (Prerequisites: G.E. 365, G.E. 375 or permission of instructor.)

G.E. 666 3 Credits Alternate Fall
Advanced Engineering Geology (2+3)
An advanced course exploring the interaction between geology and engineering works such as construction, foundations, and tunnels. Case histories will be studied, and one or two major class projects will be undertaken. Written reports will be required. (Prerequisites: Graduate standing, G.E. 365 and G.E. 372 or permission of instructor. Next offered: 1986-87.)

G.E. 675 3 Credits Alternate Fall
Applied Mining Geology (3+0)
The course will cover a wide range of investigative procedures involved in mining geology from the preproduction to terminal phases for an operation. Diverse mining models from the open-pit to deep-level underground operations will be examined and attention focused on the methodologies of mapping, sampling, on-going evaluation, and geotechnical aspects in relation to water and strata control hazards. Problem solving of case history type situations in which geological influences are evident will be stressed. (Prerequisites: Graduate standing or permission of instructor. Geos. 407 and G.E. 435 recommended. Next offered: 1985-86.)

Geoscience (Geology and Geophysics)

Geos. 101 3 Credits Fall
General Geology (3+0) n
Introduction to physical geology: a study of the earth, its materials, and the processes that effect changes upon and within it. Optional laboratory training in the use of topographic maps and the recognition of common rocks and minerals. Concurrent enrollment in the laboratory class Geos. 101L is required for geology majors and encouraged for others.

Geos. 101L 1 Credit Fall
General Geology Laboratory (0+3) n
Students are given basic training in the use of topographic maps and the recognition of common minerals and rocks. Optional lab with Geos. 101. Lab is required for Geology/Geophysics majors. Laboratory fee: $10.00. (Prerequisite: Concurrent registration or credit in Geos. 101.)

Geos. 112 3 Credits Spring
Historical Geology (3+0) n
An introduction to the principles of historical geologic interpretation, the development of the geologic time scale, the stratigraphic record and its interpretation, geosynclinal theories and plate tectonics, the fossil record and its utilization, biostratigraphy, and the evolution of the North American continent through geologic time. Concurrent registration in Geos. 112L required for geology majors, optional but recommended for others. (Prerequisites: Geos. 101 or Geos. 261.)

Geos. 112L 1 Credit Spring
Historical Geology Laboratory (0+3) n
Laboratory instruction reviews mineral and rock identification and the use of topographic maps and introduces exercises on the ordering of geologic events, physical stratigraphy, facies, correlation, invertebrate fossils, geologic map interpretation, regional geology, and applied geology. Laboratory fee $10.00. (Prerequisites: Geos. 101 and Geos. 101L or Geos. 261 plus concurrent registration or credit in Geos. 112.)

Geos. 213 4 Credits Fall
Mineralogy (2+6) n
Introduction to mineral chemistry, atomic structure, elementary crystallography, and descriptive and determinative mineralogy. Includes introduction to instrumental determinative techniques (x-ray, diffraction) and simple qualitative chemical tests. (Prerequisites: Geos. 101 or 261; Chem. 105 and concurrent registration in Math. 107-108.)

Geos. 214 3 Credits Spring
Petrology of Igneous and Metamorphic Rocks (2+3) n
Systematic study of the origin, occurrence, and classification of igneous, and metamorphic rocks. Laboratory work involves hand lens identification of representative igneous and metamorphic rocks. (Prerequisite: Geos. 213.)

Geos. 261 3 Credits Spring
General Geology for Engineers (2+3) n
(Same as G.E. 261)
Introduction to applied geology: study of common rocks and minerals, landforms, erosion, transport and deposition of geologic materials, and engineering applications of geology. (Prerequisite: Geology, science, and engineering majors, or permission of instructor.)

Geos. 262 3 Credits Fall
Mineralogy and Petrology for Engineers (2+3)
(Same as G.E. 262)
Principles and practice of classification and description of common rock, ore and soil forming minerals; principles and practice of classification and description of rocks, ores and soils commonly encountered in mining and geotechnical engineering. Physiochemical, genetic, environmental, economic and engineering aspects are considered. Course may not be used to satisfy degree requirements in Geology and Geological Engineering. (Prerequisites: G.E./Geos. 261 or Geos. 101.)

Geos. 302 3 Credits Alternate Spring
Marine Geology (3+0) n
Survey of marine geology, including structure and composition of ocean basins and continental margins, chemical and physical properties of marine sediments, geological processes in the oceans, physical resources, and conservation/pollution concerns (Prerequisite: Geos. 101, 112, or permission of instructor. Next offered: 1986-87.)

Geos. 304 3 Credits Fall
Geomorphology (3+0) n
Study of the Earth's surface features and the processes which create or modify them. Application to Quaternary history, environmental science, and related fields. Laboratory fee: $10.00. (Prerequisite: Geos. 101.)

Geos. 314 3 Credits Spring
Structural Geology (2+3) n
Origin and interpretation of primary and secondary geologic structures. Graphical solution of structural problems. (Prerequisites: Geos. 112, Phys. 103 or 211, Math. 201, Geos. 214 [or concurrent registration].)

Geos. 316 4 Credits Fall
Optical Mineralogy and Petrography (2+6) n
An introduction to optical mineralogy and petrography. Petrographic study of representative igneous, metamorphic, and sedimentary rocks, including recognition of the important rock-forming minerals is stressed. (Prerequisite: Geos. 214.)

Geos. 321 3 Credits Fall
Sedimentology (2+3) n
Broad survey of sediments, including origin, classification, composition, transportation, deposition, and diagenesis. Laboratory instruction covers identification and description of hand specimens as well as techniques of textural and compositional analysis. Laboratory fee: $10.00. (Prerequisite: Geos. 213 or permission of instructor.)

Geos. 322 4 Credits Spring
Stratigraphic Principles (3+3) n
Methods of modern stratigraphic analysis, including principles of litho-, bio-, and chronostratigraphy. Surface and subsurface stratigraphic procedures utilizing outcrop and geophysical methods, with emphasis on the interpretation of ancient depositional environments. Laboratory instruction in geologic map interpretation, surface-to-surface correlation and basin analysis. (Prerequisites: Geos. 101 or 261, 112, and 321).

Geos. 350 2 Credits Spring
Geologic Field Methods (1+3) n
An introduction to geologic field techniques as a spring preparation for field geology (Geos. 351). It includes an introduction to basic field mapping techniques, library research, data presentation, and report writing. Approximately two thirds of the course will be devoted to lecture on geologic mapping techniques, use of instruments, and making field observations. The course ends with completion of a plane table surveying project and various field mapping and observational exercises. (Prerequisites: Junior standing in geology or permission of instructor.)

Geos. 351 4 or 6 Credits Summer
Field Geology (Arranged) n
Practical experience in the procedures employed in collecting and presenting the basic data obtained from the field. Includes field mapping of stratigraphic and structural problems on topographic maps, aerial photographs, plane table maps, and presentation of results in a professional report and finished geologic map. Students pay own transportation, subsistence and course tuition fee. Entrance by preregistration only; apply through the department. Class usually is filled to capacity by February of current year. Geophysics option students may elect to take this course for 4 credits if they also register for Geos. 451, Field Geophysics. All others must take 6 credits. (Prerequisites: Junior standing in geology, Geos. 350 or equivalent and permission of instructor.)

Geos. 370 4 Credits Spring
Sedimentary and Structural Geology for Petroleum Engineers (3+3) n
Origin and distribution of sedimentary rocks including depositional environments, stratigraphic relationships, and structures. Emphasis on the relationship to petroleum occurrences and petroleum exploration. Laboratory exercises on mapping, structural problems and facies relationships in petroleum exploration. (Prerequisite: Geos. 101 or G.E. 261.)

Geos. 401 4 Credits Fall
Invertebrate Paleontology (3+3) n
Study of the invertebrate phyla with fossil records. Emphasis on soft-part anatomy and classification, followed by study of hard-part anatomy of fossil groups and their classification. Recurrent emphasis on relevant biologic principles. Laboratory study on fossil materials. (Prerequisites: Geos. 101 or by permission of instructor; Biol. 305 recommended.)

Geos. 405 3 Credits Alternate Spring
Geochronology (3+0) n
The application of the most commonly used radiometric dating methods to geologic problems. Fundamentals of the K-Ar, Rb-Sr, fission-track, U-Th-Pb and C methods. Laboratory training in K-Ar and fission-track dating techniques. (Prerequisites: Upper division standing in geology or geophysics or consent of the instructor. Next offered: 1986-87.)

Geos. 407 4 Credits Fall
Geology of Mineral Resources (3+3) n
An introduction to the occurrence and characteristics of metallic and selected non-metallic mineral deposits — geographic locations, petrotectonic settings, mineralogic and petrologic features, and theories of genesis — with applications to exploration and development. Laboratory work includes identification, characterization and systematic description of major ore types. (Prerequisites: Geos. 214 and Geos. 314 or permission of instructor.)

Geos. 408 2 Credits Spring
Map and Airphoto Analysis (1+3) n
Use of topographic maps, geologic maps, aerial photographs, and satellite imagery in the interpretation of geological structures, landscapes, landforms, and geomorphic processes. Techniques included are map compilation, photo mapping, statistical treatment of map data, and composite mapping for planning purposes. (Prerequisite: Geos. 304 or permission of instructor.)

Geos. 410 2 Credits Alternate Spring
Potential Methods in Geophysics (3+3 for ½ Semester) n
The fundamental theory of potential methods and the application to geophysical exploration will be studied along with the basic techniques and methods of interpretation of gravimetric and magnetic measurements. Class meets for one-half of the semester only. (Prerequisites: Math. 201, Phys. 212, or permission of instructor. Next offered: 1985-86.)

Geos. 411 2 Credits Alternate Fall
Seismic Exploration (3+3 for ½ Semester) n
The study of the fundamental principles of seismic exploration techniques, beginning with the basic laws of seismic wave propagation and ending with the practical application of the techniques, including both reflection and refraction methods. Class meets for one-half of the semester only. (Prerequisites: Math. 201, Phys. 212, or permission of instructor. Next offered: 1985-86.)

Geos. 412 2 Credits Alternate Spring
Electrical Methods in Geophysics (3+3 for ½ Semester) n
The fundamental principles of electrical resistivity and current flow in the earth and the practical application in the realm of geophysical exploration will be studied. Class meets for one-half of the semester only. (Prerequisites: Math. 201, Phys. 212, or permission of instructor. Next offered: 1985-86.)

Geos. 414 3 Credits Alternate Fall
Introduction to Glaciology (3+0) n
A broad survey of and introduction to glaciology including thermodynamics of phase relations, supercooling, nucleation, and freezing of water in the laboratory and in rivers, lakes, oceans, cloud droplets, soil, and animal and plant tissue. Physical processes in seasonal and perennial snow and transformation of snow to glacier ice will be examined, as well as distribution and classification of glaciers, mass balance of glaciers, glacier flow and causes of glaciation. Physical properties of and processes in frozen ground and sea ice will be studied. (Prerequisite: Math 201 or permission of instructor. Next offered: 1986-87.)

Geos. 417 3 Credits Fall
Introduction to Geochemistry (3+0) n
Introduction to chemistry of the earth. (Prerequisites: Chem. 105, 106, or permission of instructor.)

Geos. 418 3 Credits Fall
Basic Geophysics (3+0) n
The basic concepts and techniques of geophysics as applied on a global scale. Topics covered will include the origin of the earth, its structure, and the large scale dynamic processes responsible for its surface features. Geophysical techniques including seismology, gravity, magnetometry, and electrical methods will be discussed along with measurements of the earth's thermal structure, rotation rates, and the effects of the tides. (Prerequisites: Permission of the instructor.)

Geos. 422 3 Credits Fall
Geoscience Applications of Remote Sensing (3+0) n
Introduction to the scope of remote sensing and its applications to geologic, environmental and physical sciences. Includes explanation of nomenclature, a review of types of remote sensing systems, and study of the forms in which remote sensing data is available. Emphasis placed on the use of LANDSAT, radar imagery, thermal imagery and color infrared photography. (Prerequisites: Geos. 101, Phys. 103 or 211, junior standing or consent of the instructor.)

Geos. 430 3 Credits Spring
Statistics and Data Analysis in Geology (3+0) n
An introduction to the use of the computer and statistics in geology and related sciences. The course stresses geologic applications of elementary statistics, Markov chains, time-series analysis, trend-surface analysis, factor analysis, cluster analysis, discriminant analysis, and multiple regression. (Prerequisites: Math. 200 or A.S. 301; senior standing or permission of instructor.)

Geos. 451 2 Credits Summer
Practical Field Geophysics n
Designed to be a "hands-on" practical geophysics course involving both data acquisition and reduction. Techniques used will include gravimetric, radiometric, resistivity, magnetic, electro-magnetic and seismic. Taught concurrently with the last two weeks of Geos. 351, Field Geology. Entrance by preregistration only; apply through the department. Class usually is filled to capacity by February of current year. (Prerequisite: Math. 201, Phys. 212, and introductory exploration geophysics, and permission of instructor.)

Geos. 462 4 Credits Alternate Fall
Glacial and Periglacial Geology (3 + 3) n
An introduction to glaciers and their geological processes. The course emphasizes recognition and understanding of glacial landforms, sediments, and stratigraphic relations, and their implications for paleoclimatology, and paleogeography. Non-glacial techniques and methods for interpreting Quaternary sediments are also emphasized. Laboratory fee: $10.00. (Prerequisite: Geos. 304. Next offered: 1985-86.)

Geos. 482 1 Credit Fall andd Spring
Geology Seminar (1 + 0)
A weekly seminar series designed to explore a geologic theme of current interest for a complete semester. (Prerequisite: Senior or graduate standing or permission of instructor.)

Geos. 601 1 Credit Spring
Scanning Electron Microscopy (1/2 + 1)
The theory and use of the scanning electron microscope. Each student will prepare his/her own samples and will view them in the scanning electron microscope. The X-ray energy dispersive microanalyzer and other special techniques will be introduced. A written project report will be required. (Prerequisites: Graduate Standing and permission of instructor.)

Geos. 607 1-4 Credits Fall-Spring
Advanced Topics in Geology-Geophysics (1-4 + 0)
An advanced course providing a detailed treatment of various topics in geophysics. Specific topics to be covered either sequentially within a semester, or separately in different semesters include: A. paleomagnetism, B. volcanology, C. geochronology. (Prerequisite: Permission of instructor.)

Geos. 608 2-4 Credits As Demand Warrants
Advanced Exploration Geophysics (2-4 + 0)
An advanced course covering aspects of the seismic, gravimetric, magnetometric and magneto-electric techniques in geophysical exploration. (Prerequisite: Senior or graduate standing in geophysics or permission of instructor.)

Geos. 609 2-4 Credits Fall-Spring
Advanced Geomorphology (2-4 + 0-3)
An advanced course providing a detailed treatment of geomorphology. Specific topics to be covered in different semesters include A. quantitative geomorphology, B. landscape evolution, C. periglacial geology, and D. geomorphology of Alaska. Each time the course is offered only one topic will be considered. (Prerequisites: Geos. 304 or permission of instructor.)

Geos. 610 3 Credits Alternate Spring
Elements of Seismology (3 + 0)
Principles of elasticity theory as used in seismology, equations of motion in elastic media, description of waves generated by an earthquake source. Seismometry, seismographic networks and seismicity studies. Methods of determining earthquake sources and physical properties of wave propagation media. Characteristics of the interior of the earth revealed by seismological studies. (Prerequisite: Graduate level standing or permission of instructor. Next offered: 1985-86.)

Geos. 611 3 Credits Spring
Tectonics and Sedimentation (3 + 0)
A survey of sedimentary basins in various plate-tectonic settings. Emphasis on the evolution of sedimentary basins, tectonic setting as reflected in sandstone composition, and techniques of basin analysis. (Prerequisites: Geos. 402 or permission of instructor.)

Geos. 612 3 Credits Alternate Fall
Geology of Alaska (3 + 0)
Study and interpretation of the geology of Alaska. Field trips when possible. (Prerequisites: Geos. 112, 304, 314. Next offered: 1985-86.)

Geos. 613 3 Credits As Demand Warrants
Advanced Marine Geology (3 + 0)
A global study of the geology and structure of the ocean floors and continental margins. Geophysical signatures, including heat flow, seismicity, gravity, magnetics, and seismic structures of the major tectonic elements which make up oceanic crustal plates. (Prerequisite: Graduate standing or permission of instructor.)

Geos. 615 3 Credits Alternate Spring
Sea Ice (3 + 0)
A study of sea ice in the natural environment including sea ice properties and processes on the microscale and the macroscale, freezing processes and sea ice growth, ice decay, and ice dynamics. (Prerequisite: Permission of the instructor. Next offered: 1985-86.)

Geos. 616 3 Credits Alternate Spring
Permafrost (3 + 0)
The study of the occurrence, thickness, environmental problems, and mass and energy transport of permafrost, including soil and ice interaction, freezing and thawing processes, and mechanical and electrical properties and processes. (Prerequisite: Permission of the instructor. Next offered: 1986-87.)

Geos. 617 3 Credits Alternate Fall
Glaciers (3 + 0)
The mechanisms responsible for the existence, motion and variations of present day glaciers and ice sheets, the paleoclimate information which they contain, and their role in engineering hydrology. (Prerequisite: Permission of instructor. Next offered: 1985-86.)

Geos. 621 3-4 Credits Fall-Spring
Advanced Petrology (2-3 + 3-6)
An advanced course providing a detailed treatment of various aspects of petrology. Specific topics to be considered in different semesters include: A. metamorphic petrology, B. igneous petrology, and C. igneous and metamorphic petrography. Each time the course is offered, only one topic will be presented. (Prerequisites: Geos. 214, 316.)

Geos. 622 4 Credits Fall
Advanced Clastic Petrology (3 + 3)
The study of clastic sedimentary rocks, focusing on the methodology, utility and limitations of petrographic modal analysis. (Prerequisites: Geos. 321 and Geos. 316 or instructor's permission.)

Geos. 624 1-4 Credits Fall-Spring
Advanced Structural Geology and Geotectonics (1-4 + 0)
An advanced course giving a detailed treatment of structural geology. Topics offered in different semesters are: (A) structural geology of metamorphic rocks (next offered: fall 1985); (B) advanced structural geology (next offered: fall 1984); (C) geotectonics (offered each spring). (Prerequisite: Geos. 314 or permission of instructor.)

Geos. 631 3 Credits Alternate Spring
Advanced Geochemistry (1-3 + 0)
An advanced course providing an in-depth treatment of physical geochemistry. Specific topics to be presented in different semesters include: A. geochemistry of hydrothermal fluids, B. thermodynamics, and C. phase equilibria. Each time the course is offered only one such topic will be presented. (Prerequisites: Geos. 417, or Chem. 331, or Ocn. 660, or permission of instructor. Next offered: 1986-87.)

Geos. 632 4 Credits Spring
Advanced Study of Mineral Deposits (3 + 3)
A study of regional metallogeny and metallotectonics, ore genesis, geochemical exploration, and application of isotopes and trace elements. Laboratory exercises consist of integrated studies of drill core and hand specimens with reflected light and transmitted light petrography and x-ray diffraction analysis. Field mapping exercises will be held in late spring. Laboratory fee: $10.00 (Prerequisites: Geos. 316, 407, and 417.)

Geos. 635 1-4 Credits Fall-Spring
Advanced Economic Geology (1-4 + 0-3)
An advanced course providing an in-depth treatment of various aspects of economic geology. Specific topics will be considered in different semesters or sequentially within one semester. They include: A. ore microscopy, B. industrial minerals, C. economics of minerals, D. geochemistry of ore deposits, and E. modern fossil fuel exploration. Only one topic will be presented at a time. (Prerequisite: Permission of instructor.)

Geos. 641 1-3 Credits As Demand Warrants
Advanced Paleontology (1-3 + 0)
An advanced course providing a detailed treatment of various topics in paleontology. Specific topics to be presented in different semesters include: A. vertebrate paleontology, B. invertebrate paleontology, C. micropaleontology, and D. paleobotany. Each time the course is offered only one such topic will be presented. (Prerequisite: Geos. 401 or permission of instructor.)

Geos. 642 3 Credits Spring
Advanced Sedimentary Petrology (2+3)
Description and interpretation of sediments and sedimentary rocks with emphasis on the major types and current ideas regarding their processes of formation. Laboratories are designed to provide familiarity with a broad spectrum of sedimentary rock features as seen in hand specimens and thin sections. (Prerequisites: Previous coursework in sedimentation and sedimentary petrology; graduate standing or permission of the instructor.)

Geos. 643 3 Credits Fall
Advanced Stratigraphy and Sedimentology (3+0/2+3)
An advanced course providing a detailed treatment of stratigraphy and sedimentation. Specific topics to be presented in different semesters include: A. ancient and recent sedimentary environments and B. sedimentology and diagenesis. Each time the course is offered only one such topic will be presented. (Prerequisites: Geos. 321 and 322.)

German

(For UAF program in Germany, see p. 54)

Ger. 101 5 Credits Fall
Ger. 102 5 Credits Spring
Elementary German I and II (5+0) h
Introduction to the language and culture; development of competence and performance in the language through understanding, recognition, and use of linguistic structures; increasing emphasis on listening comprehension and speaking; basic vocabulary of approximately 1,000 words, exploration of the cultural dimension, implicitly through language, and explicitly through texts and audio-visual materials; use of Foreign Language Learning Center.

Ger. 201 3 Credits Fall
Ger. 202 3 Credits Spring
Intermediate German I and II (3+0) h
Continuation of German 102. Increasing emphasis on reading ability and cultural material. Conducted in German. (Prerequisite: Ger. 102 or equivalent.)

Ger. 288 2 Credits Spring
Individual Study: Reading German h
Emphasis on rapid expansion of passive vocabulary and immediate recognition of frequent idiomatic expressions and grammatical structures, development of true reading skill, modern literary and/or non-literary texts. (Prerequisites: Ger. 201, equivalent training or permission of instructor. Recommended to be taken concurrently with Ger. 202.)

Ger. 301 3 Credits Alternate Fall
Ger. 303 3 Credits Alternate Fall
Advanced German (3+0) h
Discussions and essays on more difficult subjects or texts. Translations, stylistic exercises, and special grammatical problems. Conducted in German. (Prerequisite: Ger. 202 or equivalent. Ger. 301 next offered: 1983-84; Ger. 303: 1984-85.)

Ger. 387 2 Credits Fall
Individual Study: Semantics h
Systematic expansion of passive and active vocabulary through analysis of word fields, series of synonyms and antonyms, principles of work formation, derivation, composition, etc. Conducted in German. (Prerequisites: Ger. 202 or permission of instructor.)

Ger. 432 3 Credits Alternate Spring
Studies in German Literature and Culture (3+0) h
Intensive study of authors, literary movements, periods, and/or genres. Analysis of cultural material other than texts. Conducted in German. Student may repeat course for credit when topics vary. (Prerequisites: Ger. 301 or 303 or equivalent and at least sophomore standing, or permission of instructor. Next offered: 1985-86.)

Ger. 487 2 Credits Alternate Fall
Individual Study: Translation of German Texts h
Expansion of vocabulary and grammatical knowledge, emphasis on understanding precise shades of meaning, stylistics, artistic expression and cultural values in language; and literary and non-literary texts. Student may repeat course for credit if material varies. Conducted in German. (Prerequisites: Ger. 301 or 303 or equivalent and at least sophomore standing, or permission of instructor. Next offered: 1986-87.)

Ger. 488 3 Credits As Demand Warrants
Individual Study: Senior Project h
Designed to permit the student to demonstrate ability to work with the language and the culture through the analysis and presentation, in the language, of a problem chosen by the student in consultation with the department. The student must apply for senior project and submit a project outline by the end of the 6th week of the semester preceding the semester of graduation. Offered normally in the semester preceding the student's graduation. Conducted in German. (Prerequisites: At least 10 credits in upper division German or permission of instructor.)

History

Hist. 100 3 Credits Fall and Spring
History of Alaska Natives (3+0) s
The history of Alaska Natives from contact to the signing of the Claims Settlement Act.

Hist. 101 3 Credits Fall
Western Civilization (3+0) s
The origins and major political, economic, social, and intellectual developments of western civilization to 1500.

Hist. 102 3 Credits Spring
Western Civilization (3+0) s
Major political, economic, social, and intellectual developments of western civilization since 1500.

Hist. 115 3 Credits Spring
Alaska, Land and Its People (3+0) s
A survey of Alaska from earliest days to present, its peoples, problems, and prospects.

Hist. 121 3 Credits Alternate Fall
East Asian Civilization (3+0) s
The Great Tradition. Origin and development of the civilizations of China, Japan and Korea from the beginning to 1800, with emphasis on traditional social, political, and cultural institutions. (Next offered: 1985-86.)

Hist. 122 3 Credits Alternate Spring
East Asian Civilization (3+0) s
The Modern Transformation. East Asia from 1800 to the present with emphasis on patterns of social cohesion, transition, and revolutionary change. (Next offered: 1985-86.)

Hist. 131 3 Credits Fall
Hist. 132 3 Credits Spring
History of the U.S. (3+0) s
Fall semester: the discovery of America to 1865: colonial period, revolution, formation of the constitution, western expansion, Civil War. Spring semester: from the reconstruction to the present.

Hist. 221 3 Credits Alternate Fall
Hist. 222 3 Credits Alternate Spring
English History (3+0) s
Fall semester: pre-Roman Britain to the end of the Puritan Revolution, emphasizing constitutional developments. Spring semester: from the restoration of 1660 to the present, emphasizing social and economic developments. (Next offered: 1986-87.)

Hist. 305 3 Credits Alternate Fall
Europe: 1815 to 1870 (3+0) s
Political, economic, social, and intellectual history. Development of industrial revolution, romantic movement, and unification of Germany and Italy. (Prerequisite: Hist. 102 or permission of instructor. Next offered: 1985-86.)

Hist. 306 3 Credits Alternate Spring
Europe: 1870 to 1914 (3+0) s
Continuation of Hist. 305. The rise of socialism, imperialism, and outbreak of World War I. (Prerequisite: Hist. 102 or permission of instructor. Next offered: 1985-86.)

Hist. 315 3 Credits Alternate Fall
Europe 1914-1945 (3+0) s
World War I, the Russian Revolution, the Paris Peace Conference, Fascism, Nazism, the Stalin Revolution, the Great Depression, and World War II. (Prerequisites: Hist. 101, 102 or permission of instructor. Next offered: 1986-87.)

Hist. 316 3 Credits Alternate Spring
Europe since 1945 (3+0) s
Germany and problems of the Peace, the Soviet Union and the Satellites, the Cold War, Economic Problems and Recovery, European Integration and the Common Market, Europe and the World. (Prerequisites: History 101, 102 or permission of instructor. Next offered: 1986-87.)

Hist. 320 3 Credits Every Third Spring
Modern Scandinavia (3+0) s
Scandinavia (Denmark, Finland, Iceland, Norway, and Sweden) from the 19th Century to the present: the development of Scandinavian parliamentary democracy and welfare systems, Scandinavian cooperation and neutrality, and Scandinavia's experience in the world wars. (Prerequisites: Hist. 101 or 102, or permission of the instructor. Next offered: 1985-86.)

Hist. 330 3 Credits Alternate Fall
Modern China (3+0) s
From 1800 to the present, with emphasis on resistance to change, rebellion, reform, revolution, and the rise of the People's Republic. (Prerequisite: Hist. 121 or 122, or permission of instructor. Next offered: 1985-86.)

Hist. 331 3 Credits Alternate Spring
Modern Japan (3+0) s
From 1600 to the present with an examination of change within tradition, rise to world power, and the position of Japan in the modern world. (Prerequisite: Hist. 121 or 122, or permission of instructor. Next offered: 1985-86.)

Hist. 341 3 Credits Fall
History of Alaska (3+0) s
Alaska from prehistoric times to the present. Research methodology and use of archival resources relating to Alaska's past. (Prerequisite: Junior standing.)

Hist. 344 3 Credits Every Third Spring
Modern Russia (3+0) s
Origin and development of modern Russia from the nineteenth century to the present: the development of the Soviet Union and Soviet government, stages of economic development, and Soviet foreign policy. (Prerequisites: Hist. 101, 102, or permission of the instructor. Next offered: 1986-87.)

Hist. 350 3 Credits Alternate Spring
History of the People's Republic of China (3+0) s
A survey of the history of the People's Republic of China, with particular attention being given to political, economic, and social developments, from 1949 to the present. (Prerequisite: Hist. 121 or 122, or permission of instructor. Next offered: 1986-87.)

Hist. 354 3 Credits Alternate Fall
Canadian History (3+0) s
The political, social, and economic development of Canada from the founding of New France to the present. (Next offered: 1986-87.)

Hist. 375 3 Credits Alternate Fall
History of the Northern Pacific (3+0) s
The historical development and interrelationships and problems of the North Pacific (Siberia, Canada, Alaska) from the 18th century to the present. (Prerequisite: Junior standing or permission of instructor. Next offered: 1985-86.)

Hist. 380 3 Credits Alternate Spring
Polar Exploration and its Literature (3+0) s
A survey of polar exploration efforts of all Western nations from A.D. 870 to the present and a consideration of the historical sources of this effort. (Prerequisite: Junior standing or permission of instructor. Next offered: 1985-86.)

Hist. 401 3 Credits Every Third Fall
Renaissance and Reformation Europe (3+0) s
Political, economic, and intellectual developments during the 15th and 16th centuries in Europe. (Prerequisites: Hist. 101 or 102 and junior standing, or permission of instructor. Next offered: 1986-87.)

Hist. 402 3 Credits Every Third Fall
Seventeenth and Eighteenth Century Europe (3+0) s
Political, social, economic, and cultural developments during the 17th and 18th centuries in Europe. (Prerequisites: Hist. 101 or 102 and junior standing, or permission of instructor. Next offered: 1986-87.)

Hist. 403 3 Credits Every Third Fall
The French Revolution and Napoleon (3+0) s
The political, social, and economic structure of the old regime, the revolution and the Napoleonic period, theories of revolution and interpretations of the revolutionary period of the late eighteenth century in Europe. (Prerequisites: Hist. 101 or 102 and junior standing or permission of the instructor. Next offered: 1985-86.)

Hist. 420 3 Credits Every Third Spring
Approaches to Women's History (3+0) s
A theoretical and topical approach to the study of the history of women: the role of women in politics, the economy, the family, wartime, the influence of industrialization, and changing social structures on women. (Prerequisites: Hist. 102, 132, or permission of the instructor. Next offered: 1985-86.)

Hist. 430 3 Credits Alternate Fall
American Colonial History (3+0) s
Early America European settlement: economic and social development of the American community establishment of political independence. (Prerequisites: Hist. 131, 132 or permission of instructor. Next offered: 1986-87.)

Hist. 435 3 Credits Alternate Spring
Civil War and Reconstruction (3+0) s
Political, economic, social and diplomatic history of 1860-77, disruption and re-establishment of the Union. (Prerequisites: Hist. 131, 132 or permission of instructor. Next offered: 1986-87.)

Hist. 440 3 Credits Alternate Fall
The Westward Movement (3+0) s
Westward migration: establishment of new states and political institutions. Influences of the West. (Prerequisites: Hist. 131, 132 or permission of instructor. Next offered: 1985-86.)

Hist. 450 3 Credits Alternate Spring
Twentieth Century America (3+0) s
United States from the progressive movement to the present day, with permission emphasis on domestic developments. (Prerequisites: Hist. 131, 132 or of instructor. Next offered: 1985-86.)

Hist. 455 3 Credits Alternate Fall
Military History (3+0) s
A history of warfare from classical times to the present by means of selected examples showing the interrelationships of warfare and society. Attention will also be given to the role of technology and to the development of tactics and strategy. The major emphasis will be land warfare, but sea and air power will also be considered. (Prerequisites: Junior standing or permission of instructor. Next offered: 1986-87.)

Hist. 475 3 Credits Fall
Hist. 476 3 Credits Spring
Historiography and Historical Method (3+0) s
A two-semester sequence given as a tutorial for each student. The first semester is devoted to a comparison of the historical treatment of a particular subject by different historians. Three short papers are required. In the second semester the student writes a lengthy research paper on a topic of his or her own choosing. (Those students needing only 3 credits of Hist. 457-476 will do the work outlined for the first semester. This can be done either the fall or the spring term.) (Prerequisite: Senior standing or permission of instructor.)

Hist. 484 Credits Arr. Alternate Spring
Seminar in Northern Studies s
An interdisciplinary seminar focusing on topics relating to the North with emphasis on the physical sciences, the peoples, and the socio-economic and political aspects of the area. Specialists in the various fields will assign readings and conduct discussions. (Prerequisite: At least junior standing or permission of instructor. Next offered: 1986-87.)

Human Services

HMSV 201 3 Credits Fall
Introduction to Human Services (3 + 0)
The purpose of this course is to acquaint students with the various social programs and human services which constitute society's organized response to social problems. Federal programs authorized by the Social Security Act and other legislation are presented, and various community services are described, including those directed at child welfare, alcohol and drug abuse, mental health, juvenile delinquency, and discrimination. Local human service agencies are discussed, as well as regional offices located in the rural areas. (Prerequisites: SWK 103, SOC 101 or PSY 101).

HMSV 210 3 Credits Alternate Spring
Crisis Intervention (3 + 0)
An examination of theoretical foundations and appropriate techniques and strategies to deal with individuals, families, and groups during stressful situations. Application of the crisis approach is made in several categories of stress-induced situations, such as natural disasters, developmental life crises, rapid social change, and situational crises such as illness and personal loss. (Prerequisites: PSY 101, SOC 101.)

HMSV 230 3 Credits Fall
Alcoholism: Theories of Etiology
An examination of the theories concerning the causes of alcoholism to include physical and psychological factors, such as personality disorders or disease states. Data supporting these theories will be evaluated. (Prerequisites: PSY 101, HMSV 201.)

HMSV 330 3 Credits Spring
Alcoholism: Treatment and Prevention
A survey and evaluation of treatment and prevention attempts in dealing with alcoholism and alcohol abuse with emphasis placed on prevention strategies. (Prerequisites: HMSV 230.)

HMSV 350 3 Credits Fall
Foundations of Counseling I (3 + 0)
This course is a survey of counseling philosophy and the various types of counseling systems that are used in most settings. An examination of the appropriate approach and system match will be undertaken so that the student will be able to make intelligent decisions concerning which approach to use. Some of the approaches examined will be psychoanalysis, behavior therapy, and humanistic approaches. Offshoots of these approaches will also be surveyed if they are in fairly wide use. Counseling ethics will be studied and ethical problems illustrated and discussed. (Prerequisites: PSY/SOC 340.)

HMSV 351 3 Credits Spring
Foundations of Counseling II (3 + 0)
This course is a continuation of HMSV 350 — Foundations of Counseling I. Specific counseling strategies will be studied in-depth such as crisis intervention, individual techniques such as the rational therapies and specific behavioral approaches. The role of the counselor in community education and consultation will be explored as will methods of promoting community change. Issues in cross-cultural counseling will be studied to include those likely to be encountered in Alaska. (Prerequisite: HMSV 350.)

HMSV 360 3 Credits Alternate Fall
The Helping Role in Child Abuse and Neglect (3 + 0)
This course is designed to enable participants to identify and understand the dynamics, implications and treatments of child abuse and neglect for individuals and families in rural and urban Alaska. (Prerequisites: PSY 101, SOC 101, SWK 103.)

HMSV 410 3 Credits Fall
Management of Human Services Programs (3 + 0)
Human service personnel at the baccalaureate level are often required to supervise associates or aides with less training. In rural areas such personnel may also assume responsibilities for program development and management. This course is designed to prepare students for supervisory and managerial tasks at a beginning level. It is anticipated that additional in-service training would be made available to provide techniques that are agency-specific. (Prerequisites: HMSV 350 and HMSV 351.)

HMSV 415 3 Credits Spring
Group Processes (3 + 0)
An examination of various group types to include problem solving/task-oriented groups; encounter groups; therapy groups; career guidance groups; and assertive training groups. Different theoretical orientations to groups counseling will also be discussed. (Prerequisites: HMSV 350 and HMSV 351.)

HMSV 445 3 Credits Fall
Community Psychology (3 + 0)
(Same as PSY 445)
An examination of community psychology foundations to include community assessment consultation as edited in psychology. Topics covered during the community assessment include identification of areas for study, surveys, evaluation of services, and use of results for programming. During the community consultation portion, education, prevention, and service issues are covered. Particular attention will be given to rural and small community assessment and change especially as it applies to Alaska. (Prerequisites: PSY 101, SOC 101 and HMSV 201.)

HMSV 488 6 Credits Fall and Spring
Practicum in Human Services
This course teaches the student skills with which to work in a human service agency either concurrently with an agency placement or prior to placement. Skills covered include interviewing, assessment, facilitating, intervening, and in general, case management. Students will be meeting with an instructor from the Department weekly to learn counseling skills through use of instruction, role-playing, video tapes, and various types of feedback. In addition, an instructor will be appointed by the university from the agency for practicum supervision of the student. (Prerequisites: HMSV 350 and HMSV 351. Student must be a major in the program.)

Humanities

Hum. 201 3 Credits Fall
Unity in the Arts (3 + 0) h
Concentration on the interdependence of the visual arts, the performing arts, and literature, as set against a specific social, political, and cultural background of selected eras. (Prerequisite: Open to students beyond the freshman level or by permission of the instructor.)

Hum. 202 3 Credits Spring
Unity in the Sciences (3 + 0) h
A detailed treatment of the scientific rudiments, methods, and principles as they emerged from within a larger cultural context. Explanation of the roles of mathematics and logic in the structure of the scientific enterprise. (Prerequisite: Open to students beyond the freshman level or by permission of the instructor.)

Hum. 329 3 Credits Alternate Fall
The Modern Media: Man Speaks to Man (3 + 0) h
Review of effects and trends in mass media relating man, media, and culture. (Prerequisites: 6 credits in communication, written or oral, or permission of instructor. Next offered: 1986-87.)

Hum. 332 3 Credits Alternate Spring
Varieties of Visual Expression: Art as Image and Idea (3 + 0) h
Discussion of the visual elements of art, principles of visual organization, the process of artistic perception and its evaluation by the viewer. (Prerequisites: 3 credits in the visual arts or permission of instructor. Next offered: 1986-87.)

Hum. 342 3 Credits — Alternate Spring
Synthesis in Musical Expression (3+0) h
In-depth study of one of the classical composers to show culmination of generic efforts and inter-arts relationships. (Prerequisites: Mus. 123 or 124, or permission of instructor. Next offered: 1985-86.)

Hum. 411 3 Credits — Alternate Fall
Dimensions of Literature (3+0) h
Systematic discussion of the medium of literary creation, of the organization of literary texts and the functions of literature. (Prerequisites: 6 credits in literature courses, or permission of the instructor. Next offered: 1985-86.)

Hum. 492 3 Credits — Alternate Spring
Senior Seminar (3+0) h
Report by the instructor on the state of the humanities at the University of Alaska and on alternate approaches elsewhere. Oral presentation and defense by the student, of their humanities project paper. (Prerequisites: Open requirements, or by permission of the instructor. Next offered 1986-87.)

Japanese

(For UAF program in Japan, see p. 54)

Jpn. 101 3 Credits — Fall
Jpn. 102 3 Credits — Spring
Elementary Japanese I and II (3+0) h
Introduction to the language and culture: development of competence and performance in the language through understanding, recognition and use of linguistic structures; increasing emphasis on listening comprehension and speaking, basic vocabulary of approximately 500 words, exploration of the cultural dimension, implicitly through language, and explicitly through texts and audio-visual materials use of Foreign Language Learning Center.

Jpn. 201 3 Credits — Fall
Jpn. 202 3 Credits — Spring
Intermediate Japanese I and II (3+0) h
Continuation of Jpn. 102 with increasing emphasis on reading ability and cultural material. Standard Japanese texts for reading including selections from modern Japanese literature. (Prerequisite: Jpn. 102 or equivalent.)

Jpn. 301 3 Credits — Fall
Advanced Japanese (3+0) h
Develops advanced conversational proficiency and cultural understanding, and introduces more complex syntactical structures. Student may take course for credit more than once if materials and grammatical contents vary. (Prerequisite: Jpn. 202 or equivalent.)

Jpn. 302 3 Credits — Spring
Reading and Writing Kanji (3+0) h
Develops advanced reading and writing proficiency through working with Kanji. Emphasis is placed on modern literary and documentary texts, on character analysis and on the relationships between Kanji and general culture. (Prerequisite: Jpn. 301 or equivalent.)

Journalism — Broadcasting

J-B 101 3 Credits — Fall and Spring
Introduction to Mass Communications (3+0) h
A survey of the history and principles of mass communications and the role of the information media in American society. An introduction to various professional aspects of mass communications, including both print and broadcast media.

J-B 102 3 Credits — Fall
Broadcasting and Society (3+0) h
A study of the principles of broadcasting as it relates to the people of the United States, including history, government involvement, and the ever-changing technologies of radio, television, cable, and satellites.

J-B 203 3 Credits — Fall and Spring
Basic Photography (2+3)
Fundamentals of photography, including use of an adjustable camera, film and exposure techniques, filters, flash techniques, and an introduction to color. Practical black and white darkroom procedures including film processing and printing. Use of design and composition as it applies to photography. Students who enroll must have use of an adjustable camera. Laboratory fee: $30.00. (Course may not be used to meet major or minor requirements in journalism - broadcasting).

J-B 204 3 Credits — Fall and Spring
Basic Photojournalism (2+3)
Theory and practice of photographic communications including use of an adjustable camera, basic film developing and printmaking, flash and design elements applied to visual communications. Students will practice making candid-type photos of people involved in news events and will learn how to objectively document visual news. Course emphasizes preparation of pictures for publication. Students who enroll must have the use of an adjustable camera. Laboratory fee: $30.00.

J-B 215 3 Credits — Fall
Audio Production (2+3)
Basics of sound production for radio, television, film, and stage amplifications. Emphasis on writing, recording, control room techniques, and editing. Laboratory fee: $10.00.

J-B 301 4 Credits — Fall and Spring
Basic Newsgathering and Processing (2+4) h
Fundamentals of news reporting, writing, and editing, including news evaluation and news story structure, editing copy, writing headlines and captions, and cropping and sizing of pictures. Laboratory fee: $10.00. (Prerequisites: Engl. 111 and Engl. 211, 213, or 311, junior standing, or permission of the instructor.)

J-B 303 3 Credits — Fall and Spring
Intermediate Photography (2+3)
Continuation of J-B 204 with emphasis on the picture story and freelance photography. Laboratory fee: $30.00. (Prerequisite: J-B 204 or permission of instructor.)

J-B 311 3 Credits — Fall and Spring
Magazine Article Writing (2+1)
Study and practice in writing articles for publication in national media. Students repeating the course limited to a total of six credits. (Prerequisites: J-B 301 or permission of instructor.)

J-B 316 3 Credits — Spring
Television Productions (2+4)
Basic aspects of television production, floor directing, audio, camera, film chain, staging, lighting, and switching. (Prerequisites: J-B 215 or permission of the instructor.)

J-B 317 3 Credits — Fall
Broadcast Journalism (3+0)
Preparation of announcements, commercials, interviews, music continuity, special events programs, documentaries, commentaries, news, and other basic broadcast continuity. Administrative aspects of production are included. (Prerequisite: J-B 301, or permission of instructor.)

J-B 320 3 Credits — Spring
Journalism in Perspective (3+0) h
Examination of present problems and trends in mass communication with emphasis on their historical development, including survey of world press coverage and problems. (Prerequisite: Junior standing.)

J-B 323 3 Credits — Fall
Magazine Editing (3+0)
Principles and problems of magazine management and editing: content selection, design, editorial responsibility, and economics of publishing. (Prerequisite: Junior standing.)

J-B 324 3 Credits — Spring
Typography and Publication Design (2+2)
Theory and practice of typography, layout, and design, coupled with a study of the methods of printing production. (Prerequisite: Permission of instructor.)

J-B 326 3 Credits **Spring**
Principles of Advertising (3 + 0)
(Same as B.A. 326)
Theory and practice of advertising: including strategy, media use, creation and production of advertisements and measurement of advertising effectiveness. (Prerequisite: Junior standing.)

J-B 372 3 Credits **Alternate Fall**
Methods of Instructional Broadcasting (3 + 0)
Studio practices and procedures for the production of instructional programs. Underlying educational philosophy and actual in-studio practice. (Prerequisite: J-B 215 or permission of the instructor. Next offered: 1986-87.)

J-B 400 3 Credits **Fall and Spring**
Advanced Media Practicum (1 + 6)
Practical training in print or electronic communication. Participation at an approved publication or broadcast station required. (Prerequisite: Permission of instructor.)

J-B 402 3 Credits **Fall and Spring**
Advanced Photography (2 + 3)
Special techniques in a variety of areas of publications photography. Each student will concentrate on one or more of the following areas: special lighting, special effects, freelance photography, studio photography, sports, color photography, etc. Laboratory fee: $30.00. (Prerequisite: J-B 303.)

J-B 407 3 Credits **Spring**
Programming and Production (3 + 0)
The study of programming practices at radio and TV stations and networks and cable companies and the relationship of these practices with sales, audience, and government. (Prerequisites: J-B 215 and J-B 316 or permission of instructor.)

J-B 411 3 Credits **Fall and Spring**
Advanced Magazine Article Writing (3 + 0)
Study and practice in writing advanced articles for publication in national and international media. May be repeated for credit with permission of instructor. (Prerequisite: J-B 311, or permission of instructor.)

J-B 413 3 Credits **Fall**
Mass Media Law and Regulation (3 + 0)
Study of the common law, statutory law and administrative law that affects the mass media, including libel, slander, censorship, copyright, access to the media, constitutional problems, invasion of privacy, shield laws, and broadcast regulations. (Prerequisite: J-B 301, or permission of the instructor.)

J-B 415 3 Credits **Spring**
Videography (2 + 2)
The study and practice of ENG (Electronic News Gathering) and EFP (Electronic Field Production) using remote videotape equipment and videotape editing. (Prerequisites: J-B 204 and J-B 215.)

J-B 416 3 Credits **Alternate Fall**
Advanced Broadcast Production (1 + 6)
An advanced course in broadcast production where the student can choose either TV or radio production projects. Each student will be responsible for producing, directing, and writing productions in either or both media. The productions must be of a quality to air on either KUAC-TV or KUAC-FM. Students repeating the course limited to a total of six credits. (Prerequisites: J-B 215, 316, or permission of instructor. Next offered: 1985-86.)

J-B 420 3 Credits **Spring**
Book Writing (3 + 0)
Research and writing of biography, autobiography, and other books. May be repeated for credit with permission of instructor. (Prerequisites: J-B 311, 411, or permission of instructor.)

J-B 424 3 Credits **Spring**
Magazine Production (2 + 3)
Practical experience in all phases of magazine publication, including writing, photography, editing, design, layout, advertising, and circulation. Students edit and produce the magazine, *Alaska Today*, under the supervision of journalism faculty members. (Admission by arrangement; editorial positions open to students who have completed J-B 323.)

J-B 433 3 Credits **Fall**
Public Relations (3 + 0) h
Insights into the techniques, causes and consequences of influencing public opinion; propaganda, mass communication and public relations as instruments of economic, political, and social change. (Prerequisites: J-B 301, or permission of instructor.)

J-B 444 4 Credits **Fall and Spring**
Advanced Newsgathering and Processing (2 + 4)
Advanced reporting, writing and editing of news with emphasis on public affairs at all levels, local to national, including government, police and the courts, labor and political organizations, and editorial and critical writing. Development of sophisticated skills in copy editing, headline writing, news judgment and positioning, page layout and use of pictures. Laboratory fee: $10.00. (Prerequisites: J-B 301, junior standing, or permission of the instructor.)

Justice

Just. 110 3 Credits **Fall and Spring**
Introduction to Justice (3 + 0) s
Survey of various philosophies, functions, and methods of social control with emphasis on role of law and those involved in its administration — police, courts, and corrections organizations. Includes study of history, organization, processes, and problems related to law and justice agencies in a heterogeneous, democratic society.

Just. 221 3 Credits **Spring**
Justice Organization and Management (3 + 0)
Survey of organization and management of police, court, correctional and legal institutions, justice agency roles, goals, structured arrangements and administrative practices, applicability of theory and research, techniques and instruments of organization and management, and principles of change.

Just. 250 3 Credits **Fall**
Development of Law (3 + 0) s
Study of underlying philosophy, development and structure of law with emphasis on law system of United States and Alaska. Includes "civil" precedents of such constitutional provisions as "due process" and "equal protection" in the United States Bill of Rights, criticisms of law, review of native law ways, and procedures for changing law.

Just. 251 3 Credits **Spring**
Criminology (3 + 0) s
The study of the major areas of deviant behavior and its relationship to society, law, and law enforcement, including the theories of crime causation. (Prerequisites: Soc. 101.)

Just. 258 3 Credits **Alternate Fall**
Juveniles and the Law (3 + 0) s
The role of agencies under the law in regard to the juvenile, with special attention to the role of law enforcement. Both theoretical and practical aspects will be studied. (Next offered: 1986-87.)

Just. 259 3 Credits **Alternate Spring**
(Same as P.S. 212)
Introduction to Public Administration (3 + 0) s
Theory, principles, and practices of public administration, especially as applied to municipal agencies. Study of planning and organization, decision making, and the formation and administration of public policy. (Next offered: 1986-87.)

Just. 310 3 Credits **Spring**
Principles of Corrections (3 + 0) s
An introduction to the basic concepts of probation and parole: the use of authority in corrective services, institutional treatment methods, and a study of popular and professional concepts in corrections. (Prerequisite: Just. 251 or permission of instructor.)

Just. 320 Variable Credit **Spring**
Practicum
A research oriented course directed at the resolution of a specific problem within an agency of the criminal justice system. (May be repeated to a maximum of 6 credits.)

Just. 330 3 Credits Fall and Spring
Justice and Society (3+0) s
The role and operation of justice institutions from the perspective of their utility to groups and societal interests. Justice institutions under stress such as during the Third Reich, McCarthy Era, Watergate, Vietnam War, Environmental Revolution, and War on Crime. Relationships between community and justice organizations.

Just. 352 3 Credits Fall
Criminal Law (3+0)
A study of the elements, purposes, and functions of the substantive criminal law with emphasis upon historical and philosophical concepts. (Prerequisite: Just. 110.)

Just. 354 3 Credits Spring
Procedural Law (3+0)
(Criminal Procedure)
Emphasis upon the legal limitations of the police and the right of the people to be secure from the government under the protections of the Constitution and the Rules of Evidence. (Prerequisite: Just. 110.)

Just. 451 3 Credits Fall
Research, Planning, and Policy Analysis (3+0)
Application of social science research methods and analytical tools to justice planning and policy problems, political and rational planning with such tools as modeling, sampling theory, queuing theory, Delphi, PERT/CPM, scenarios, and paradigms.

Just. 452 3 Credits Spring
Comparative Criminal Justice (3+0) s
Structure and processes of criminal justice operations in selected countries. Police systems, court operations, and correctional facilities are all examined and compared to similar institutions in the U.S. (Prerequisites: Just. 110, senior standing or permission of instructor.)

Just. 460 3 Credits Fall
Justice Processes (3+0) s
Study of processes and issues in police, court, and correctional agency operations. Definition of goals, organizational design and development, organizing and managing financial, personnel and management processes, budget, union, communication, record, community-based programs, inspection, and program assessment. Contemporary administrative process problems. (Prerequisite: Just. 110, Just. 251, or senior standing.)

Just. 475 3 Credits Fall and Spring
Internship
On site experience in a criminal justice agency. Graded pass/fail. (Prerequisite: Senior standing or permission of instructor.)

Just. 492 Variable Credit Fall and Spring
Seminar
Various topics of current interest and importance to the justice major will be presented. Topics will be announced prior to each offering. (Prerequisites: Just. 110, senior standing or permission of instructor.)

Library Science

L.S. 101 1 Credit Fall and Spring
Library Skills (0+0)
An independent study course in college library skills and some resources and facilities common to academic libraries in general and to the Rasmuson Library in particular. No class sessions are held; the student works at his individual rate and on his own time schedule.

L.S. 201 3 Credits Spring
Information Resources and Strategies (3+0)
Introduces elements and principles of information organization, finding and reporting in the humanities, sciences, and social sciences, including surveys of major reference sources in these disciplines. Requires preparation of an annotated bibliography, and should be taken in conjunction with a course requiring an upperdivision term paper. (Prerequisite: L.S. 101 or permission of instructor.)

Linguistics

Ling. 101 3 Credits Alternate Fall
Nature of Language (3+0) h
A beginning course in the study of language: systematic analysis of human language and description of its grammatical structure, distribution, and diversity. (Next offered: 1986-87.)

Ling. 216 3 Credits Alternate Fall
Languages of the World (3+0) h
A comprehensive survey of the world's languages — both past and present. Topics to be covered include genetic relationships among languages, linguistic change, language universals, language classification, and language families, as well as the interaction of culture and language. (Next offered: 1985-86.)

Ling. 318 3 Credits Alternate Spring
Phonetics and Phonemics (3+0)
An introduction to scientific study of human speech sounds, the mechanism of their production, and the sound systems of languages. (Prerequisites: Upper division standing or permission of instructor. Next offered: 1985-86.)

Ling. 432 3 Credits Alternate Spring
Intro. to Syntactic Theory (3+0) h
An introduction to the study of the principles and processes of sentence construction in language. (Prerequisites: Ling. 101 or its equivalent, at least junior standing or permission of the instructor. Next offered: 1986-87.)

Ling. 488 3 Credits As Demand Warrants
Individual Study: Senior Project (3+0)
Designed to permit the student to demonstrate ability to work on a problem of linguistics chosen by the student in consultation with the department. The student must apply for senior project and submit a project outline by the end of the 6th week of the semester preceding the student's graduation. (Prerequisite: Senior standing in Linguistics major.)

Mathematics

No student will be permitted to enroll in a course having prerequisites if a grade lower than C is received in the prerequisite course.

Math. 103 3 Credits Fall
Math. 104 3 Credits Spring
Concepts of Mathematics 3(3+0)
A study of mathematical thought and history designed for students with a limited mathematical background. Mathematical reasoning rather then formal manipulation is emphasized. Topics may be chosen from number theory, topology, set theory, geometry, algebra and analysis. (Prerequisite for Math 104: Math 103 or consent of instructor.)

Math. 107 3 Credits Fall and Spring
Elementary Functions (3+0)
A study of algebraic, logarithmic, and exponential functions, together with selected topics from algebra. (Prerequisite: Two years of high school algebra and Math. 107 placement or higher.)

Math. 108 2 Credits Fall and Spring
Trigonometry (2+0)
A study of the trigonometric functions. (Prerequisite: Math. 107 or concurrent registration in Math. 107.)

Math. 109 3 Credits As Demand Warrants
Analytic Geometry (3+0)
Rectangular coordinate system, the straight line, conic sections, transcendental curves, polar coordinates, parametric equations, and solid analytic geometry.

Math. 110 3 Credits Fall and Spring
Mathematics of Finance (3+0)
Simple and compound interest, discount, annuities, amortization, sinking funds, depreciation, and capitalization. (Prerequisite: One year high school algebra or its equivalent.)

Math. 161 3 Credits Fall and Spring
Algebra for Business and Economics (3+0)
Functions of one and several variables studied with special attention given to linear, polynomial, rational, logarithmic, and exponential relationships. Geometric progressions as applied to compound interest and present value. Linear systems of equations and inequalities. All applications are from the fields of economics and business. (Prerequisites: Two years of high school algebra and Math. 161 placement or higher.)

Math. 162 4 Credits Fall and Spring
Calculus for Business and Economics (4+0)
Ordinary and partial derivatives. Maxima and minima problems, including the use of Lagrange multipliers. A brief introduction to the integral of a function of one variable. Applications include marginal cost, productivity, revenue, point elasticity of demand, competitive/complementary products, consumer's surplus, etc. (Prerequisites: Math. 161.)

Math. 171 3 Credits Spring
Mathematics for Life Sciences (3+0)
Algebraic, trigonometric, exponential, and logarithmic functions with applications to problems arising in the life sciences. (Prerequisite: Two years of high school algebra and Math. 171 placement or higher.)

Math. 200 4 Credits Fall and Spring
Math. 201 4 Credits Fall and Spring
Math. 202 4 Credits Fall and Spring
Calculus (4+0)
Techniques and application of differential and integral calculus, vector analysis, partial derivatives, multiple integrals, and infinite series. (Prerequisites: Math. 107-108.)

Math. 203 4 Credits Fall
Finite Math. (4+0)
Topics covered include: symbolic logic, partitions, binomial and multinomial theorems, probability, finite stochastic processes, linear algebra, Markov chains, linear programming, and game theory. (Prerequisite: Math. 162, or 272, or 200.)

Math. 205 3 Credits Fall
Mathematics for Elementary School Teachers I (3+1)
Elementary set theory, numeration systems, and algorithms of arithmetic, divisors, multiples, integers, introduction to rational numbers. (Prerequisites: one year high school algebra or its equivalent.)

Math. 206 3 Credits Spring
Mathematics for Elementary School Teachers II (3+1)
A continuation of Math. 205. Real number systems and sub-systems, logic, informal geometry, metric system, probability, and statistics. (Prerequisite: Math. 205.)

Math. 210 1 Credit Fall and Spring
Calculus and the Computer (1+0)
Computer implementation of numerical methods of elementary calculus. Functions, limits, roots, differentiation, maxmin, integration, and differential equations. Emphasis is on problem analysis and interpretation of results. (Prerequisite: Concurrent registration in Math. 162 or 200 or 272 or completion of one of these courses.)

Math. 211 1 Credit Spring and Fall
Linear Algebra and the Computer (1+0)
Computer implementation of numerical methods of elementary linear algebra. Solution of systems of linear equations, matrix inversion, determinants, characteristic roots, linear optimization, and iterative methods. (Prerequisite: Math. 210.)

Math. 272 3 Credits Fall
Calculus for Life Sciences (3+0)
Differentiation and integration with applications to the life sciences. (Prerequisites: Math. 171 or Math. 107 and Math. 108.)

Math. 273 3 Credits Spring
Calculus for Life Sciences (3+0)
Applications of integration. Differential and difference equations as models of real life processes. Partial differentiation. (Prerequisite: Math. 272.)

Math. 302 3 Credits Fall and Spring
Differential Equations (3+0)
Nature and origin of differential equations, first order equations, and solutions, linear differential equations with constant coefficients, systems of equations, power series solutions, operational methods, and applications. (Prerequisite: Math. 202.)

Math. 305 3 Credits As Demand Warrants
Geometry (3+0)
Topics selected from such fields as Euclidean and non-Euclidean plane geometry, affine geometry, projective geometry, and topology. (Prerequisite: Math. 202 or permission of instructor.)

Math. 307 3 Credits Fall
Discrete Mathematical Structures (3+0)
A study of finite algebraic systems and their applications. Sets, graphs, finite state machines, semigroups, and groups. Boolean algebra. Additional topics may be chosen from combinatorics, language theory, coding, computability, lattices, rings, and fields. (Prerequisites: Math. 201 or 203, or permission of instructor.)

Math. 308 3 Credits Spring
Abstract Algebra (3+0)
Theory of groups, rings, and fields. (Prerequisites: Math. 307 or 314 or permission of instructor.)

Math. 310 3 Credits As Demand Warrants
Numerical Analysis (3+0)
Direct and iterative solutions of systems of equations, interpolation, numerical differentiation and integration, numerical solutions of ordinary differential equations, and error analysis. (Prerequisite: Math. 302 or permission of instructor. A knowledge of FORTRAN or BASIC is desirable.)

Math. 314 3 Credits Spring
Linear Algebra (3+0)
Linear equations, finite dimensional vector spaces, matrices, determinants, linear transformations, and characteristic values. Inner product spaces. (Prerequisite: Math. 202 or Math. 211.)

Math. 371 3 Credits As Demand Warrants
Probability (3+0)
Probability spaces, conditional probability, random variables, continuous and discrete distributions, expectation, moments, moment generating functions, and characteristic functions. (Prerequisite: Math. 202.)

Math. 401 3 Credits Fall
Math. 402 3 Credits Spring
Advanced Calculus (3+0)
A rigorous treatment of one and several dimensional calculus. Includes the study of mappings from n-space and their continuity, differentiability and integrability properties as well as sequences and series. (Prerequisites: Math. 314 or 421 for Math. 401; Math. 401 for Math. 402.)

Math. 404 3 Credits As Demand Warrants
Topology (3+0)
Introduction to topology, set theory, open sets, compactness, connectedness, product spaces, metric spaces, and continua. (Prerequisite: Math. 308 or Math. 314.)

Math. 408 3 Credits As Demand Warrants
Mathematical Statistics (3+0)
Distribution of random variables and functions of random variables, interval estimation, point estimation, sufficient statistics, order statistics, and test of hypotheses including various criteria for tests. (Prerequisites: Math. 371 and A.S. 301.)

Math. 421 4 Credits Fall
Applied Analysis I (4+0)
Vector calculus, including gradient, divergence, and curl in orthogonal curvilinear coordinates, ordinary and partial differential equations and boundary value problems, and Fourier series and integrals. (Prerequisites: Math. 302 or concurrent enrollment in Math. 302.)

Math. 422 4 Credits Spring
Applied Analysis II (4+0)
Topics in multi-variate calculus, including boundary value problems and partial differential equations of mathematical physics complex functions, including series, integrals, residues, conformal mapping, and potential theory. (Prerequisite: Math. 421.)

Math. 423 3 Credits As Demand Warrants
Applied Mathematics (3+0)
Topics to be determined at the time of registration to fit the needs of the students. (Prerequisite: Senior standing or permission of instructor.)

Math. 460 3 Credits Spring
Mathematical Modeling (3+0)
Analysis, construction, and interpretation of mathematical models. Applications to the physical, biological, and social sciences. Topics will be selected from combinatorics, probability, statistics, perturbation, numerical analysis, and differential equations. Students will develop a modeling project. (Prerequisites: A.S. 301, Math. 201, Math. 211.)

Math. 603 3 Credits Alternate Fall
Real and Complex Analysis I (3+0)
General theory of measure and integration for real and complex-valued functions, convergence theorems, product measures and Fubini's Theorem, and Radon Nikodym Theorem. Metric and Banach spaces and the Riesz Representation Theorem for the real line. (Prerequisites: Math 401-402 or permission of instructor. Next offered: 1985-86.)

Math. 604 3 Credits Alternate Spring
Real and Complex Analysis II (3+0)
Analytic functions, power series, Cauchy integral theory. Basic topology of the complex plane and structure of analytic functions. Applications to illustrate the interplay between real and complex analysis, e.g., the Poisson integral of complex Borel measures on the circle, analytic measures and the F. and M. Riesz Theorem. Applications and special topics to be selected on the basis of instructors' interests and students' interests and may vary each time course is offered. (Prerequisite: Math. 603. Next offered: 1985-86.)

Math. 608 3 Credits As Demand Warrants
Partial Differential Equations (3+0)
First and second order differential equations, boundary value problems, and existence and uniqueness theorems. Green's functions, and principal equations of mathematical physics. (Prerequisite: Math. 422 or permission of instructor.)

Math. 611 3 Credits Alternate Fall
Math. 612 3 Credits Alternate Spring
Mathematical Physics (3+0)
(Same as Phys. 611, 612)
Advanced consideration of such topics as transform methods, asymptotic methods, Green's function, Sturm-Liouville theory, conformal mapping, and calculus of variations with applications to problems arising in physics. (Prerequisite: Math. 422 or consent of instructor. Next offered: 1985-86.)

Math. 621 3 Credits Alternate Fall
Advanced Applied Analysis I (3+0)
Introduction to complex analysis and its applications. Series expansions, contour integration, generating functions, conformal mapping, and Fourier and related transform methods. Special functions. Asymptotic methods. (Prerequisites: Math 421-422 or Math. 401-402 or permission of instructor. Next offered: 1986-87.)

Math. 622 3 Credits Alternate Spring
Advanced Applied Analysis II (3+0)
Topics in applied analysis to be determined at the time of registration to fit the needs of the students. (Prerequisites: Math. 421-422 or Math. 401-402 or permission of instructor. Next offered: 1986-87.)

Math. 630 3 Credits Alternate Fall
Advanced Linear Algebra and Its Applications (3+0)
Selected topics from matrix theory and matrix inequalities, canonical forms, finite dimensional vector spaces, eigenvalue problems, non-negative matrices and quadratic forms. (Prerequisites: Math. 314 and graduate standing or permission of instructor. Next offered: 1985-86.)

Math. 631 3 Credits Alternate Spring
Theory of Modern Algebra (3+0)
The Sylow Theorems, normal series and other topics from group theory. The theory of rings and fields including polynomial rings, unique factorization domains and Galois Theory. (Prerequisites: Math. 308 and graduate standing or permission of instructor. Next offered: 1985-86.)

Math. 660 3 Credits As Demand Warrants
Advanced Mathematical Modeling (3+0)
An examination of models and procedures reflecting problems arising in the physical and social sciences. Derivation of model equations and methods for solution. Heat conduction problems, random walk processes, simplification of equations, dimensional analysis and scaling, perturbation theory, and a discussion of self-contained modules that will illustrate the principal modeling ideas. Students will normally be expected to develop a modeling project as part of the course requirements. (Prerequisites: Consent of CS graduate advisor.)

Math. 661 3 Credits As Demand Warrants
Optimization (3+0)
(Same as CS 661)
Linear and nonlinear programming, simplex method, duality and dual simplex method, post-optimal analysis, constrained and unconstrained nonlinear programming, Kuhn-Tucker condition. Applications to management, physical, and life sciences. Computational work with the computer. (Prerequisites: Knowledge of calculus, linear algebra, and computer programming.)

Math. 663 3 Credits As Demand Warrants
Applied Combinatorics and Graph Theory (3+0)
A study of combinatorial and graphical techniques for complexity analysis including generating functions, recurrence relations, theory of counting, planar directed and undirected graphs, and applications to NP complete problems. (Prerequisites: Consent of CS graduate advisor.)

Mechanical Engineering

M.E. 150 1 Credit Fall
Aerodynamics for Pilots (1+1)
Nature of the atmosphere, elementary airfoil theory, drag and power requirements, performance computations, and introduction to stability. For those who desire a basic understanding of flight with minimum mathematical background. (Prerequisite: High school algebra and general science.)

M.E. 302 4 Credits Spring
Mechanical Design (3+3)
Kinematics and dynamics of mechanisms. Analysis and design of displacements, velocities, accelerations, and forces in linkages, cams, and gear systems by analytical, experimental, and computer methods. (Prerequisites: E.S. 208 and E.S. 201.)

M.E. 313 3 Credits Spring
Mechanical Engineering Thermodynamics (3+0)
Continuation of E.S. 346 including power and refrigeration cycles (Rankine, Brayton, Otto, and Diesel), compressible flow (isentropic, shock waves, and flow in ducts with friction), combustion and gas vapor mixtures. (Prerequisites: E.S. 341 and E.S. 346).

M.E. 321 3 Credits Fall
Industrial Processes (2+3)
Introductory course covering a wide spectrum of manufacturing processes used in modern industry, primary and secondary manufacturing processes, casting, hot and cold forming, machining, welding, and mass production tools and techniques as related to economic and efficient product design.

M.E. 403 4 Credits Fall
Mechanical Design II (3+2)
Design and analysis of machines by analytical, experimental and computer methods. Identification of requirements and conceptual design of mechanical systems, detailed design of components, strength, life, reliability, and cost analysis. (Prerequisites: M.E. 302 and E.S. 331.)

M.E. 404 3 Credits Spring
Stress Analysis (3+0)
Analysis of the strength, stability and rigidity of machine components by analytical and computer methods. (Prerequisites: E.S. 331, Math. 302, E.S. 201.)

M.E. 408 3 Credits **Spring**
Dynamics of Systems (2+2)
Response of mechanical, fluid, and thermal systems to internal, external, and control forces. Free and forced vibration, random vibration, self-excited vibration, control systems, and stability criteria. Non-linear systems. (Prerequisites: E.S. 201 and E.S. 301.)

M.E. 409 3 Credits **Spring**
Controls (2+2)
Analysis and design of mechanical, electrical, and human control systems. (E.S. 201, E.S. 301.)

M.E. 414 3 Credits **Fall**
Thermal Systems Design (3+0)
Introduction to the design of power and space conditioning systems, energy conversion, heating, ventilating, air conditioning, total energy systems, and introduction to thermal system simulation and optimization. (Prerequisite: E.S. 346.)

M.E. 415 2 Credits **Fall**
Thermal Systems Laboratory (1+3)
Testing and evaluation of components and energy systems such as pumps, fans, engines, heat exchangers, refrigerators, and heating/power plants. (Prerequisites: E.S. 341 and M.E. 313.)

M.E. 416 3 Credits **Fall**
Design of Mechanical Equipment for the Petroleum Industry (3+0)
Design, selection, and operation of mechanical equipment used in the production and processing of crude oil and gas. Instrumentation and control systems used with the mechanical equipment. (Prerequisites: E.S. 341 and E.S. 346.)

M.E. 441 3 Credits **Spring**
Heat and Mass Transfer (3+0)
Fundamental concepts of heat and mass transfer including steady state and transient conduction, laminar and turbulent free and forced convection, evaporation, condensation, ice and frost formation, black body and real surface radiation, and heat exchangers. (Prerequisite: E.S. 346.)

M.E. 450 3 Credits **As Demand Warrants**
Theory of Flight (3+0)
Airfoil theory in subsonic and supersonic flow. Propulsion systems, stability and performance of aircraft. (Prerequisite: Consent of instructor.)

M.E. 464 3 Credits **Spring**
Corrosion Engineering (3+0)
Principles and forms of corrosion and factors that affect it. Methods of testing and measurement, control and prevention are examined. (Prerequisite: Senior standing in engineering.)

M.E. 487 3 Credits **Spring**
Design Project
A real or simulated engineering design project selected jointly by student and instructor. Emphasis on design of practical mechanical engineering systems and/or components which integrate students' engineering knowledge and skills. (Prerequisite: Senior standing.)

M.E. 601 3 Credits **Alternate Fall**
Finite Element Analysis in Engineering (3 + 0)
Formulation of the finite element method. Applications to problems of engineering in solid mechanics, fluid mechanics, and heat transfer. Use and development of codes for computer solution of problems. (Prerequisites: Graduate standing in engineering, ES 201 and Math. 302 or equivalent. Next offered: 1985-86.)

M.E. 604 3 Credits **Alternate Spring**
Experimental Mechanics (2+3)
Theory and application of the methods of experimental mechanics. Primary emphasis on photoelasticity, strain gages and brittle coating. Methods of collecting and processing data, and calculation of stresses and strains from such data. (Prerequisites: Graduate standing in engineering. Next offered: 1985-86.)

M.E. 617 4 Credits **As Demand Warrants**
Power Analysis (3+3)
Fundamentals of power generation including piping, pumps, fuels and combustion, steam generators, condensers, deareators, evaporators, feedwater treatment and heating, regeneration, fuel handling, heat balance, equipment, economics, and plant layout. (Prerequisite: M.E. 313.)

M.E. 631 3 Credits **Alternate Fall**
Advanced Mechanics of Materials (3+0)
Theories of elasticity and plasticity for small and large deformations. Applications to engineering problems. (Prerequisites: Graduate standing in engineering, ES 331 or equivalent. Next offered: 1985-86.)

M.E. 634 3 Credits **Alternate Spring**
Advanced Materials Engineering (3+0)
Atomic bonding, crystal structure, crystal imperfections, phases and interfaces, micro-structures, phase diagrams, phase transformation, transport and diffusion, metal deformation, fracture of materials, deterioration of materials, electronic and physical properties of materials. (Prerequisites: Graduate standing in engineering, ES 334, Math. 302 or equivalent. Next offered: 1985-86.)

M.E. 641 3 Credits **Alternate Spring**
Advanced Fluid Mechanics (3+0)
Introduction to viscous flows, laminar boundary layers, turbulent boundary layers, turbulent jets and wakes, applications to heat transfer and drag. (Prerequisites: Graduate standing in engineering. Next offered: 1985-86.)

M.E. 642 3 Credits **Alternate Spring**
Advanced Heat Transfer (3+0)
Heat conduction in two and three dimensions under steady and transient conditions. Free and forced convection in internal and external flows. Radiation from black and gray surfaces and gas-filled enclosures. Both analytical and numerical methods are covered. (Prerequisites: Graduate standing in engineering. Next offered: 1986-87.)

M.E. 685 3 Credits **Alternate Spring**
Arctic Heat and Mass Transfer (3+0)
An introduction to the principles of heat and mass transfer with special emphasis on application to problems encountered in the Arctic such as ice and frost formation, permafrost, condensation, and heat loss in structures. (Prerequisite: C.E. 603. Next offered: 1985-86.)

M.E. 687 3 Credits **Alternate Spring**
Arctic Materials Engineering (3+0)
A study of engineering material performance at low temperatures. (Prerequisites: Senior or graduate standing in science or engineering and C.E. 603 or equivalent. Next offered 1985-86.)

Medical Science

All medical science courses are graded pass/fail with the exception of Med.S. 201, Factors in Health and Disease.
A refundable $75 equipment security fee is collected from the WAMI medical students at registration.

Med.S. 201 3 Credits **Fall**
Factors in Health and Disease (3+0)
This course is offered to any interested student as an introduction to the phenomenon of human disease. Cases will be presented to demonstrate the manner by which the normal healthy state may be disrupted by either external or internal influences. The natural histories of major types of disease will be reviewed including bacterial, viral and parasitic infection, cancer, degenerative processes, mental illness, congenital disorders, and environmental health factors. There will be a review of the social mechanisms which have been developed to maintain health and to care for the ill.

Med.S. 510 1 Credit **Fall**
Medical Preceptorship (0+4)
Students will spend one morning each week with a preceptor (practicing physician). During the preceptorship, each student will become acquainted with the clinical application of basic science data, observe response of patients to disease and health care delivery system, experience some of the practical problems in medical practice and develop a rapport with practicing physicians and some of their patients. The objective of the preceptorship is to allow each student to gain insight into the role of the practicing physician, to further kindle his/her enthusiasm for medical practice and to provide him/her with information which will be helpful in making decisions relative to his/her future career in medicine. (Prerequisite: Medical student status or special graduate student with permission of course chairman.)

Med.S. 513 2 Credits Fall
Clinical Medicine (2+0)
This course is designed to teach general interviewing skills, point out common sources of error in verbal communication and inquiry as well as sources of bias peculiar to medical interviewing, and enable the student to take and record selected portions of the medical history. Weekly practice sessions are held at Fairbanks Memorial Hospital. (Prerequisite: Medical student status or special graduate student with permission of course chairman.)

Med.S. 515 2 Credits Fall
Ages of Man (2+0)
In presenting the progression of the individual from conception to senescence and death, this course provides a conceptual framework which relates many areas of medical study. Included are selected aspects of normal somatic and psychologic development, as well as review of the stress peculiar to each age group, and the clinical abnormalities most prevalent at each stage of development. Field trips to specific institutions and interviews with patients and families provide clinical correlations with classroom concepts. (Prerequisite: Medical student status or Biol. 210; non-medical student status may be admitted with permission by the instructor.)

Med.S. 519 2 Credits Fall
Human Embryology (2+0)
Fertilization through parturition, with emphasis on development of systems pertaining to the understanding of gross anatomy and congenital malformations. Companion course to Med.S. 611. (Prerequisite: Medical school freshman status or concurrent enrollment in Med.S. 611 and consent of instructor.)

Med.S. 520 4 Credits Spring
Pathobiology (3+2)
Fundamental principles of pathobiology with special emphasis on pertinent clinical problems. Biochemistry, structural alterations, and pathophysiologic mechanisms will be interrelated with specific coverage of cell injury, inflammation, tissue repair, neoplasia, and immunopathology. Laboratory sessions will include microscopic and gross examination of normal and abnormal specimens as well as attendance at selected autopsy demonstrations. (Prerequisites: Medical student status or graduate student who has completed Med.S. 614, 616 or equivalent and with permission of course chairman.)

Med.S. 523 2 Credits Spring
Behavioral Systems (2+0)
Introductory course designed to familiarize freshman medical students with concepts and data derived from behavioral sciences which are relevant to the work of a general physician. Organic, intrapsychic, interpersonal, social, and cultural determinants of human behavior are discussed within the context of the life cycle. Through lectures, audio visual presentations, assigned readings, and clinical illustrations utilizing material from various areas of the behavioral sciences an attempt will be made to enhance the students' appreciation of human behavior as a multidimensional testing. (Prerequisite: Medical student status or graduate student with permission of course chairman.)

Med.S. 533 2 Credits Spring
Rural Health (1+3)
This course is designed to permit future medical practitioners to explore their potential for rural practice. The Alaskan situation is used to exemplify factors which affect health and the delivery of health services in rural areas. The structures of health care delivery systems in Alaska are described and the advantages and disadvantages or rural practice are explored. A field trip to rural areas of Alaska is the laboratory credit for the course. (Prerequisites: Medical student status or permission of course chairman.)

Med.S. 535 2 Credits Spring
Clinical Medicine (2+0)
Continuation of Med.S. 413, Clinical Medicine offered fall semester. Upon completion of this course, student should be able to conduct the complete medical historical interview, perform the general physical examination, and record this data in the form of the "problem oriented medical record." Course will use both classroom work and practical exercises at Fairbanks Memorial Hospital. Patients will be examined by individual students in this course. (Prerequisite: Med.S. 513.)

Med.S. 553 1 Credit Spring
Nutrition in Medicine (1+0)
Nutritional aspects of medicine are presented through consideration of basic foodstuffs, their sources and preparation, deficiency states and malnutrition, diets for prevention and control of diseases, fad diets, and food taboos. The physiology, physiologic chemistry and clinical aspects of nutrition will be stressed. (Prerequisite: Medical student status or Biol. 210; non-medical student status may be admitted with permission by the instructor.)

Med.S. 611 3 Credits Fall
Anatomy of the Trunk (2+2)
Gross anatomy and embryology of the thorax, abdomen, and pelvis, with special reference to commonly encountered anomalies, pathology, physical diagnosis, clinical correlation, and approach. Laboratories will involve dissection of human material, supplemented by prosection material and oral presentations by both faculty and students. (Prerequisite: Medical school freshman status or graduate student with consent of course chairman. Concurrent enrollment in Med.S. 612 and Med.S. 616 recommended because a knowledge of organ structure and function will be assumed.)

Med.S. 612 4 Credits Fall
Physiological Mechanisms (4+0)
Presentation of a number of physiologic mechanisms applicable to various organ systems: Excitability of membranes, muscle contraction, epithelial transport, the action of neurotransmitters, hormones, and drugs on target organs. The principles of homeostasis and control of these basic mechanisms are illustrated in the discussions of reflexes, temperature regulation, and gastrointestinal physiology. Pathophysiology of these mechanisms is presented to illustrate relevance to clinical medicine. This course presents concepts and examines mechanisms prerequisite to the detailed study of the physiology of various organ systems conducted in subsequent courses in the WAMI curriculum. It is not useful to students who would not be taking any of the subsequent courses (Med.S. 632 and 634). (Prerequisites: Medical student status or some undergraduate premedical courses plus permission of the instructor.)

Med.S. 614 4 Credits Fall
Medical Biochemistry (4+0)
An in-depth consideration of that portion of biochemistry dealing with molecular structure, special chemistry and physiological function of various classes of biomolecules such as carbohydrates, proteins, lipids, nucleic acids, and vitamins. Enzymatic and hormonal control of metabolic pathways, coupling of oxidative metabolism to production of ATP and metabolism of specific tissues such as nerve and muscle is discussed. Certain diseases of man are included as examples of abnormal metabolic function. In addition, fundamentals of nitrogen metabolism are presented and related to other metabolic pathways upon a framework of basic information on the four major classes of biomolecules: proteins, lipids, carbohydrates, and nucleic acids. Concepts describing replication and transcription and translation of genetic information are presented. The relation of these current ideas to cellular biology and the enzymatic control of metabolic pathways are emphasized throughout. (Prerequisites: Medical school freshman status; one year of organic chemistry or equivalent; permission of instructor.)

Med.S. 616 3 Credits Fall
Histology (2+3)
Light and electron microscopic structure and basic functional relationships of cells, tissues, and organs. Pathological alteration will be employed to emphasize the structural and functional properties of normal components. The course will fulfill the need for a descriptive histology course. Elementary pathologic processes will be referred to for emphasis of normal structures and to acquaint students with the fundamental aspects of cellular response to injury. (Prerequisite: Medical school freshman status or consent of instructor. Basic knowledge of biological chemistry is highly recommended. Consent of instructor required because the student will be expected to know or concurrently acquire more knowledge of organic molecules and their arrangement in cells and tissues.)

Med.S. 621 5 Credits Spring
Infectious Disease (5+0)
The biology of medically important organisms will be presented. Properties of viral, bacterial, fungal, Rickettsial, and protozoan and helminth agents of disease will be related to the characteristics, diagnosis, treatment and sequelae of the morbidity. Immunological principles will be elucidated. Prevention of infection and action of antimicrobial agents will be considered. (Prerequisite: Medical student status or graduate student with consent of course chairman, broad knowledge of biology and organic chemistry will be assumed.)

Med.S. 626 2 Credits Fall
Medical Cell Biology (2+0) n
A multidisciplinary approach to the study of the function, structure and regulation of cells and cell parts. Emphasis is on the plasma membrane, cytoplasmic components and nucleus. Dynamic principles of cellular activities, such as turnover, shape and motility, secretion, growth and differentiation is stressed. Interactions of cells with other cells and with substrate is discussed. (Prerequisite: Medical student status or permission of instructor.)

Med.S. 630 1 Credit Spring
Epidemiology (1+0)
The study of disease propagation through human populations is presented by first describing the language of classical epidemiology and then coupling that language to modern mathematical modeling. Emphasis is placed on the multi-factorial courses of disease and on the problem of critically evaluating not only these causes themselves, but scientific reports of same. (Prerequisite: Medical student status or consent of course chairman.)

Med.S. 631 3 Credits Spring
Anatomy of Head and Neck (2+3)
Anatomy and pathology of structures in the head and neck, excluding brain. Laboratories will include human dissection, study of sterioscopic atlases of anatomy and study of pathology slides. Clinical cases, problem solving and physical examinations will be presented to illustrate anatomic principles. (Prerequisite: Medical student status or graduate student permission of instructor. This course will be integrated with Med.S. 632, Neural Sciences, and is designed to complement it, but the latter is not a prerequisite. Knowledge of general anatomic terms is required.)

Med.S. 632 5 Credits May and June
Neural Sciences (4+2)
A multidisciplinary approach to the control of behavior by the central nervous system. Initial discussions present the embryologic development of the nervous system and the anatomical organization and physiological operation of the spinal cord. Supraspinal sensory and motor functions are approached as longitudinally organized systems which exert a hierarchical control over spinal mechanisms. Analyses of certain basic behaviors, such as the regulation of metabolism, sleep/wakefulness cycles, defense/attack behavior and reproduction, emphasize the integrated action of somatomotor, visceromotor, vicerosecretory, and endocrinologic mechanisms. Cortical lesions provide a basis for an understanding of such intellectural functions as learning, memory, and speech. All seminar topics and laboratory exercises encompass neurophysiological, neuropathological, and neurological material. Videotapes of patients offer an opportunity to solve relevant clinical problems which illustrate lesions pertinent to the course material. This course employs a seminar format, and therefore emphasizes student initiative and instructor-student interaction. This course is offered as a block, five hours per semester. (Prerequisite: Medical student status or graduate student with permission of course chairman.)

Military Science

Mils. 100, 200 1 Credit Fall and Spring
Outdoor Skills Laboratory (0+2)
Introduction to the fundamentals of various outdoor skills such as mountaineering, orienteering, marksmanship, arctic survival, skiing, and snowshoeing. Emphasis is on practical work. The same skills are not taught both semesters. (Corequisite: Concurrent registration in another basic military science course [111, 112, 201 or 202])

Mils. 111 2 Credits Fall
U.S. Army and Society I (2+0)
Survey and analysis of the origin, development, organization and function of the American military. Focus is on the structure and purpose of the U.S. Army and ROTC program and the civilian-military relationship. An introduction to chain of command and small unit organization is provided to include characteristics of officers and their relation to subordinate leaders and enlisted men and women.

Mils. 112 2 Credits Spring
U.S. Army and Society II (2+0)
Survey of human behavior and leadership in the organizational context of the army and military environment. The role of the soldier, military training, discipline, ethics, and professionalism are presented. Students are introduced to behavioral dimensions and management techniques used by successful officer-leaders.

Mils. 113 2 Credits Spring
Map Reading and Orienteering (2+0)
Introduction to military and civilian topographical maps and their related informational content, use of the lensatic compass and map as navigational instruments. Practical exercises in orienteering complement academic instruction.

Mils. 201 2 Credits Fall
U.S. Defense and World Affairs (2+0) s
A study of current world events and how they affect the military leader and defense structure. Historical as well as political events are studied to learn their relationships to the decision making processes. Geography is considered as an influential factor affecting the economic base of a nation, and both are considered in terms of socio-political influence on military thought. Current military strengths and weaknesses of power groups are discussed and analyzed. The course is team taught with the university faculty.

Mils. 202 2 Credits Spring
Communications Arts for the Military Leader (2+0)
A study of the principles of public speaking and instructional techniques. Emphasis is upon the development of functional skills through rehearsed and unrehearsed presentations. Instructional techniques, to include the use of audio-visual aids, provides intensive practice in developing lesson plans and skill in presentation.

Mils. 250 3 Credits Summer
Basic Camp
Six week practical field work to prepare students who did not take basic course for entrance into the advanced course. Camp prepares student in basic military skills and leadership experience. (Prerequisite: At least two years of schooling remaining upon completion of camp. Admission by arrangement with professor of military science.)

Mils. 300, 400 1 Credit Fall and Spring
Outdoor Skills Laboratory (0+2)
Advanced training in mountaineering, orienteering, marksmanship, arctic survival, skiing and snowshoeing. Students assist in giving instruction and in organizing and managing the lab. Emphasis is on practical work. May be repeated for a maximum of two credits at each level. (Prerequisite: Junior or senior standing in military science.)

Mils. 301 3 Credits Spring
Theory and Dynamics of Tactical Operations (3+1)
Detailed examination of the concepts, principles, and techniques applicable to the current doctrine of tactical operations. The course emphasizes the role of the small unit leader in planning, directing, and controlling the efforts of individuals and small units to accomplish offensive, defensive, and specialized combat operations. Practical application of performance objectives and the integration of support functions are emphasized. Laboratory consists of practical leadership development. (Prerequisites: Junior standing in Mils. or permission of instructor.)

Mils. 303 3 Credits Fall
Advanced Leadership (3+1)
(Same as B.A. 303)
An interdisciplinary approach to the study of effective leadership in the contemporary environment. Analysis of individual skills, emphasizing a behavioral approach to effective decision making. For ROTC cadets, class and laboratory includes preparation for advanced camp (Mils. 350). (Prerequisites: Junior standing in Mils. or permission of instructor.)

Mils. 350 3 Credits Summer
Advanced Camp
Six week practical field work for students enrolled in the advanced course. Camp is structured as a leadership workshop allowing students to utilize leadership skills in a variety of situations in a military environment. (Prerequisite: Must be enrolled as an advanced course cadet and have completed MS III.)

Mils. 351 2 Credits Summer
Cadet Troop Leadership Training
Three week full-time leadership training and development. Serving in leadership positions with the Active Army. Applying leadership and management principles in real life junior officer situations/positions in a military environment. (Prerequisite: Must be enrolled as an advanced course cadet and completed MS III and Advanced Camp, Mils. 350.)

Mils. 401 3 Credits Fall
Seminar on Tactical Operations (3+1) s
A study of the conduct of tactical operations from the time of Hannibal to the present. The course is designed to introduce the student to a wide variety of historical examples where application or violation of sound tactical principles, or various styles and types of leadership have produced success or failure. Laboratory consists of practical leadership roles and seminars. (Prerequisites: Senior standing in Mils. or permission of instructor.)

Mils. 402 3 Credits Spring
Seminar in Leadership and Management (3+0)
A study and overview of management principles, management practices, and military justice. Emphasis is on the review of management principles and skills through advanced readings and case studies. Students will receive an orientation on the various administrative, training, logistical, and maintenance tools used in the military. Class includes preparation for commissioning. (Prerequisites: Senior standing in Mils. or permission of instructor.)

Mineral Preparation Engineering

M.Pr. 304 3 Credits Alternate Fall
Introduction to Metallurgy (3+0)
Definitions and principles of basic science and engineering principles as applied to process and adaptive metallurgy. (Prerequisites: Chem. 211, Phys. 212. Next offered: 1985-86.)

M.Pr. 313 3 Credits Fall
Introduction to Mineral Preparation (2+3)
Elementary theory and principles of unit processes of liberation, concentration, and solid-fluid separation as applied to mineral beneficiations. (Prerequisite: Junior standing or permission of the instructor.)

M.Pr. 314 3 Credits Alternate Spring
Unit Preparation Processes (1+6)
Principles and practices involved in liberation and concentration by gravity, electro-magnetic, 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: M.Pr. 313. Next offered: 1986-87.)

M.Pr. 410 3 Credits Alternate Fall
Surface Materials Handling Systems (2+3)
The techniques and design of systems to move ore, concentrates, and waste materials in mining and milling operation. (Prerequisite: Senior standing or permission of the instructor. Next offered: 1986-87.)

M.Pr. 418 3 Credits Spring
Emission Spectroscopy, X-Ray Spectroscopy, and Atomic Absorption (2+3)
Can be taken for any combination of parts A, B, C as demand warrants. (Admission by special arrangement.)

M.Pr. 418A — Theory and application of emission spectrography: two one-hour classes and one three-hour lab per week for five weeks. One credit.

M.Pr. 418B — Theory and application of x-ray spectography and diffractometer: two one-hour classes and one three-hour lab per week for five weeks. One credit.

M.Pr. 418C — Theory and application of atomic absorption spectrophotometry: two one-hour classes and one three-hour lab per week for five weeks. One credit.

M.Pr. 433 3 Credits Alternate Fall
Coal Preparation (2+3)
Units operations, flowsheets, washability characteristics, and control by sink-float methods for coal preparation plants. Market requirements and economics of preparation. (Prerequisite: M.Pr. 313. Next offered: 1985-86.)

M.Pr. 601 3 Credits Fall
Froth Flotation (2+3)
Theory and application of bulk and differential froth flotation to metallic minerals, non-metallic minerals, and coal. (Admission by arrangement.)

M.Pr. 606 3 Credits Spring
Plant Design (1+6)
Selection, design and layout of equipment for erection and operation of mineral and coal beneficiation plants for specific custom and milling problems. (Admission by arrangement.)

M.Pr. 684 3 Credits Fall
Mineral Preparation Research (1+6)
Familiarizes students with the concept of basic research and its needs in the field of mineral beneficiation, including such research subjects as magnetic susceptibility, dielectric constants, and electrical conductivity of minerals; chemical theory and mechanism of bubble contact in flotation, and the effect of ultrasonic vibration in unit processes. (Admission by arrangement.)

M.Pr. 688 1 Credit Fall
Graduate Seminar I (1+0)
(Same as Min. 688)
Preparation and presentation of research outlines by graduate students and participation in regularly organized Mineral Engineering Department seminars. (Prerequisite: Admission to graduate program.)

Mining Engineering

Min. 101 3 Credits Fall
Minerals, Man and the Environment (3+0)
A general survey of the impact of the mineral industries on man's economic, political, and environmental systems.

Min. 102 1 Credit Spring
Introduction to Minerals Industry (1+0)
Fundamentals of the mineral industry.

Min. 103 3 Credits Fall
Introduction to Mining Safety and Engineering (1+6)
Concepts and methods utilized in mining engineering. Practical training in safety and mining unit operations.

Min. 202 3 Credits Spring
Mine Surveying (2+3)
Surveying principles for surface and underground control of mining properties. Field and office procedures for preparation of maps and engineering data. (Prerequisites: Math. 107-108.)

Min. 301 3 Credits Spring
Mine Plant Design (3+0)
Quantitative study and design of various systems and equipment used in haulage, hoisting, drainage, pumping and power (compressed air and electricity). The importance of the natural conditions and production level in the equipment selection procedure is emphasized. (Prerequisites: E.S. 208, E.S. 307, E.S. 341.)

Min. 302 3 Credits Spring
Underground Mine Environmental Engineering (2+3)
Analysis of underground mine ventilation systems, ventilation requirements and systems structure, ventilation planning, design and engineering control, mine ventilation network, gas dust, explosion rescue and recovery. (Prerequisite: Min. 103.)

Min. 400 1 Credit As Demand Warrants
Practical Engineering Report
Twelve weeks of 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.

Min. 407 2 Credits Spring
Mineral Industry and the Environment (2+0)
Principles and practices with the origin and disposal of solid, liquid, and gaseous wastes generated in the production of mineral commodities and the impact of regulations designed for their reduction or elimination. (Prerequisite: Permission of instructor.)

Min. 408 3 Credits Spring
Mineral Valuation and Economics (3+0)
Theory of sampling techniques, deposit and reserve calculations, and analysis of mineral economic problems. (Prerequisite: Permission of the instructor.)

Min. 409 3 Credits Spring
Operations Research and Computer Applications in Mineral Industry (3+0)
Introduction of the concept of a mine as a system, structuring of real life situations into a mathematical model, and use of operations research and computer techniques for understanding, analysis, forecasting and optimization of mining operations and systems. (Prerequisites: Min. 301 or concurrent registration, E.S. 201, and A.S. 451 or A.S. 301.)

Min. 433 3 Credits Alternate Fall
Mining Access, Safety, and Environmental Law (3+0)
History of the development of mining law as it pertains to access to property, safety and environmental laws as they pertain to mining. The essentials of federal and Alaskan laws along with discussion and interpretation of important court decisions on mining litigation including land access, mine safety, and environmental concerns will be presented. (Prerequisite: Senior standing or permission of instructor. Next offered: 1986-87.)

Min. 443 3 Credits Fall
Rock Fragmentation (3+0)
Selection and design of modern mining rock disintegrating techniques. In particular, cutting, drilling, blasting, water jets, hydrometallurgy and other methods are covered. (Prerequisite: Min. 370.)

Min. 445 3 Credits Fall
Design of Surface Mines for Conventional and Arctic Conditions (3+0)
An integrated view of unit and support operations in surface mines, and in-depth treatment of various surface mining methods. Principles and reclamation techniques, design of surface mine infrastructure. (Prerequisites: Min. 443 or concurrent registration.)

Min. 446 3 Credits Fall
Underground Mining Methods and Their Design (3+0)
Design of main development openings; mining methods such as room and pillar, open stoping, supported stopes and caving systems; selection of mining method and mine planning processes will be covered. (Prerequisites: Min. 301, Min. 302, and Min. 370.)

Min. 447 3 Credits Fall
Mining Methods for Placer and Offshore Deposits (3+0)
The design of placer and offshore mining methods. Normal class is supplemented by guest lecturers. Field trips as appropriate are taken. (Prerequisites: Min. 301, senior standing or permission of the instructor.)

Min. 472 3 Credits Fall
Design, Construction and Stability of Mining Openings (3+0)
Stability and design of excavating methods, reinforcement and monitoring systems for openings constructed in rock mass. Construction in swelling rock and frozen ground, underground hazards (bursts and water inflow) as well as monitoring of deformation and stresses associated with the opening's presence are covered. (Prerequisites: Min. 370, Min. 443.)

Min. 490 2 Credits Spring
Mining Design Project (1+3)
Each student in the course will be required to complete a major project which will demonstrate the student's mastery of the concepts leading to site selection, acquisition of necessary permits, design of mine layout including extraction and beneficiation, economic aspects of the specific mine being designed and economic evaluation of the complete mining cycle. (Prerequisites: Min 408, Min. 445, Min. 446, and Min. 447; Min. 408 can be taken concurrently.)

Min. 621 3 Credits Alternate Spring
Advanced Mineral Economics (3+0)
Economics of mineral exploitation and utilization. International trade, state and federal policies; financial control, and research methods. (Admission by arrangement. Next offered: 1986-87.)

Min. 631 4 Credits Alternate Fall
Research Methods in Mineral Engineering (3+3)
Research methods including problem definition and statement, designing experiments, collecting data and interpreting them. Methods of theoretical and experimental analysis will be reviewed and examples given. (Prerequisites: Math. 302 or equivalent, Min. 370 or C.E. 435 or permission of instructor. Next offered: 1986-87.)

Min. 635 3 Credits Alternate Fall
Geostatistical Ore Reserve Estimation (2+3)
Introduction to the theory and application of geostatistics in the mining industry. Review of conventional methods of ore reserve estimation, sampling design and computer applications. Review of classical statistics, log normal distributions and global estimation. Presentation of fundamental geostatistical concepts including: variogram, estimation variance, block variance, kriging, geostatistical simulation. Emphasis on the practical application to mining. (Prerequisites: Min. 408 or equivalent, A.S. 451 or equivalent. Next offered: 1986-87.)

Min. 637 3 Credits Alternate Fall
Mine Systems Simulation (2+3)
Application of computer simulation to the analysis of static and dynamic mine systems and the development of useful programs for mine operators. Design of simulation experiments in mining engineering. (Prerequisites: Min. 409; or ESM 621 and a course in computer programming; or equivalent. Next offered: 1986-87.)

Min. 646 3 Credits Alternate Spring
Mining Engineering in the Arctic (3+0)
An in-depth treatment of mining engineering problems encountered in arctic conditions. Design and construction of mine openings in frozen ground, mechanical and thermal properties of rocks at subfreezing temperatures, fragmentation and excavation of frozen ground, surface mining problems in the arctic climate, equipment maintenance, mined land reclamation and economic evaluation of mineral properties in arctic regions. Case studies also are presented. (Prerequisites: Min. 301, Min. 302, Min. 370, Min. 445 or equivalent or permission of instructor. Next offered: 1985-86.)

Min. 647 2 Credits Alternate Fall
Advanced Underground Mine Design (1+3)
Design of underground mining methods based upon the geological and physical descriptions of mineral deposits. Design and layout of underground mines. Design of room and pillar, sublevel caving, block caving and open stoping systems. Equipment selection, production scheduling, ventilation design and mining costs. Engineering drawings. (Prerequisites: Min. 301 or equivalent, Min. 302 or equivalent, Min. 370 or equivalent. Next offered: 1985-86.)

Min. 652 3 Credits Alternate Spring
Numerical Methods in Mine Ventilation (2+3)
Differencing schemes for the partial differential equations of flow in mine networks, typical boundary conditions for mine ventilation systems, computer-aided solution techniques. Application to flow of fluids through porous media is covered. (Prerequisites: Min. 302 or equivalent, a course in computer science and a course in differential equations. Next offered: 1986-87.)

Min. 673 3 Credits — Alternate Fall
Theoretical and Experimental Methods in Rock Mechanics (2+3)
The study of theoretical and experimental methods in rock mechanics. State of stress and potential failure zone around two and three dimensional structures in rock based on theoretical, numerical, experimental techniques, and failure criteria are presented. (Prerequisite: Min. 370 or equivalent. Next offered: 1986-87.)

Min. 674 3 Credits — Alternate Spring
Selected Topics in Rock Mechanics (2+3)
A study of current rock mechanic problems which are related to advances in mining and construction technologies, with particular emphasis on the importance of rock and frozen ground properties and stress evaluation in designing and monitoring stability of structures for gas, oil and radioactive materials storage, geothermal energy recovery, colution mining, and those exposed to rock outbursts and earthquakes. Rock and frozen ground properties related to other dynamic loading conditions, such as in blasting, are also discussed. (Prerequisites: Min. 370 or equivalent, Min. 673 or equivalent, or permission of instructor. Next offered 1986-87.)

Min. 688 1 Credit — Fall
Graduate Seminar I (1+0)
(Same as M.Pr. 688)
Preparation and presentation of research outlines by graduate students and participation in regularly organized Mineral Engineering Department seminars. (Prerequisite: Admission to graduate program.)

Min. 689 1 Credit — Spring
Graduate Seminar II (1+0)
Presentation of graduate research by graduate students and participation in regularly organized Mineral Engineering Department seminars. (Prerequisite: Admission to graduate program.)

Music

Music Ensembles And Class Lessons

Mus. 101 1 Credit — Fall and Spring
Choral Society (0+3) h

Mus. 151 1 Credit — Fall and Spring
Class Lesson (0+3) h
Class instruction in piano, voice, orchestral instrument, or guitar. Class lesson fee: $60.00 (Mus. 151 may be repeated for credit. Course may not be audited.)

Mus. 153 1 Credit — Fall and Spring
Functional Piano (1+0) h
Piano laboratory: instruction designed to help music majors obtain the performance, sight-reading, and harmonization-transposition skills needed to pass the Piano Proficiency Examination. It also provides non-music majors with an opportunity to study basic piano skills on a space-available basis. Lesson fee: $60.00 (Prerequisites: Music majors — Mus. 131 or equivalent or concurrent enrollment in Mus. 131; non-music majors: permission of instructor. Course may not be audited.)

Mus. 203 1 Credit — Fall and Spring
Orchestra (0+3) h
(Admission by audition.)

Mus. 205 1 Credit — Fall and Spring
Concert Band (0+3) h
(Admission by audition.)

Mus. 211 1 Credit — Fall and Spring
"Choir of the North" (0+3) h
(Admission by audition.)

Mus. 253 0 Credit — Fall and Spring
Piano Proficiency (0+1)
Final phase of completion of piano proficiency examination. (Prerequisite: Mus. 153 and permission of instructor.)

Mus. 307 1 Credit — Fall and Spring
Chamber Music (0+3) h
String, brass, or woodwind chamber music; piano chamber music and accompanying; stage band, and Madrigal singers. (Prerequisite: Permission of instructor.)

Mus. 313 1, 2, 3 Credits — Fall and Spring
Opera Workshop (0+3, 6 or 9) h

Mus. 317 1 Credit — Fall and Spring
Arctic Chamber Orchestra (0+3) h
Chamber Music. (Admission by audition.)

Mus. 606 2 Credits — As Demand Warrants
Advanced Chamber Music (2+0)
Advanced string, woodwind, brass, vocal chamber music, piano chamber music and accompanying. (Prerequisite: Mus. 307 or permission of instructor.)

Applied Music

Mus. 161, 162 2 or 4 Credits — Fall and Spring
Mus. 261, 262 2 or 4 Credits — Fall and Spring
Mus. 361, 362 2 or 4 Credits — Fall and Spring
Mus. 461, 462 2 or 4 Credits — Fall and Spring
Private Lessons h
Private instruction in piano, voice, orchestral instruments, or guitar. Private instruction shall consist of one private lesson and one master class per week. Music performance majors may enroll for four credits. All others will normally enroll for two credits. Private lesson fee: $125.00 (Prerequisite: Admission by audition. Course may not be audited.)

Mus. 190 0 Credit — Fall and Spring
Recital Attendance (1+0)
Recital and concert attendance.

Mus. 661 2 or 4 Credits — Fall and Spring
Advanced Private Lessons
Private instruction in piano, voice, or orchestral instrument consisting of one private lesson and one master class per week. Repeatable for credit. Private lesson fee: $125.00 (Prerequisites: Mus. 462 or equivalent and by audition.)

Music Theory, Music History, and Music Education

Mus. 103 3 Credits — Fall and Spring
Music Fundamentals (3+0) h
An introductory study of the language of music. Includes basic notation, melodic and rhythmic writing, scales, bass and treble clefs, and basic harmony.

Mus. 123 3 Credits — Spring
Appreciation of Music (3+0) h
A guide to the richer enjoyment of classical music through a study of the main periods, styles, and composers from the time of the Gregorian chant to the present.

Mus. 124 3 Credits — Fall
Music in World Cultures (3+0) h
A survey of traditional and folk music around the world, with an emphasis on Oriental and African music. The course examines the different uses of music in various societies, and includes demonstration of ethnic musical instruments.

Mus. 131 2 Credits — Fall
Mus. 132 2 Credits — Spring
Basic Theory (1+2) h
First semester: Intensive training in fundamentals of music, pitch and rhythm notation, scales, modes, triads, and techniques of harmonization. Second semester: Concentration upon acquisition of skills in harmonization and techniques of formal and harmonic analysis.

Mus. 133 2 Credits — Fall
Mus. 134 2 Credits — Spring
Basic Ear Training (2+0) h
Intensive training in ear training skills including sight reading, sight singing, error detection, and dictation. Use will be made of programmed materials in a laboratory situation in addition to classroom instruction. Concurrent enrollment in Music 131 or 132 required unless exempted by music theory placement examination.

Mus. 221 3 Credits — Fall
Mus. 222 3 Credits — Spring
History of Music (3+0) h
Fall semester: Music before 1750. Spring semester: Music since 1750. (Prerequisite: Mus. 131-132 or permission of the instructor.)

Mus. 223 3 Credits — Spring
Native Alaskan Music (3+0) h
A course to acquaint the student with the variety of Eskimo and Indian dance and song styles in Alaska. Emphasis on the sound, effect, and purpose unique to each. The course covers collection methods, analysis, and the development of a broad musical perspective.

Mus. 231 3 Credits — Fall
Mus. 232 3 Credits — Spring
Advanced Theory (2+3) h
Continued study, in depth, of harmony and musical form through analysis of representative works from the standard repertoire. The second semester will be devoted to study and synthesis of 20th century stylistic and harmonic idioms. (Prerequisites: Mus. 131, 132 or permission of instructor.)

Mus. 309 3 Credits — Fall
Elementary School Music Methods (3+0)
(Same as Ed. 309)
Principles, procedures, and materials for teaching music to children at the elementary level. (Prerequisite: Ed. 314.)

Mus. 315 2 Credits — Fall and Spring
Music Methods and Techniques (1+2)
Instruction in voice and the basic instruments of band and orchestra. Emphasis on teaching methods in these areas. This course number is repeatable for credit. See Music Department Handbook. (Prerequisite: Permission of instructor.)

Mus. 331 3 Credits — Alternate Spring
Form and Analysis (3+0) h
A detailed survey of formal and stylistic musical elements in historical context with special application to problems of proper stylistic performance. (Prerequisite: Mus. 232 or permission of the instructor. Next offered: 1985-86.)

Mus. 351 3 Credits — Fall
Conducting (3+0) h
Principles of conducting; interpretation of vocal and instrumental ensemble music. (Prerequisite: Mus. 232.)

Mus. 405 3 Credits — Spring
Secondary School Music Methods (2+3)
Principles and methods of teaching music in junior and senior high school with emphasis on philosophies, management, objectives, teaching techniques, choral, and general music programs. Includes the implementation of teaching plans in classroom and rehearsal settings. (Prerequisite: Permission of instructor. Should be taken prior to Ed. 453 — Secondary Student Teaching.)

Mus. 421 3 Credits — Alternate Fall
Music before 1620 (3+0) h
Study of music from its origins in Greek antiquity through the Middle Ages and the Renaissance up to and including the emergence of opera at the turn of the seventeenth century. Includes study of prominent composers, early musical forms, original sources in translation, development of musical notation, and development of early musical instruments. (Prerequisites: Mus. 221 and 222 or permission of instructor. Next offered: 1986-87.)

Mus. 422 3 Credits — Alternate Spring
Music in the Seventeenth and Eighteenth Centuries (3+0) h
Study of music from the turn of the seventeenth century through Beethoven. Examination of style and performance practices relating to opera, oratorio, cantata, sonata, and concerto, as well as chamber music. Development of keyboard instruments as well as other instrumental genres: strings, winds, and brasses. Intensive music listening as well as reading contemporary sources in translation. Style study of representative works from early Baroque composers through Bach, Handel, Bach's sons, Haydn, Mozart, Beethoven, and others. Musical developments in Italy, England, France, Germany, Austria, and cross-cultural influences. (Prerequisites: Mus. 221 and 222 or permission of instructor. Next offered: 1986-87.)

Mus. 423 3 Credits — Alternate Fall
Music of the Nineteenth Century (3+0) h
Study of musical trends in the 19th century. Romanticism, Nationalism, Italian Opera, and Wagnerian Music Drama, as exemplified by representative works, chosen from the music of Weber, Berlioz, Mendelssohn, Schumann, Brahms, Wagner, Chopin, Tchaikowsky, and others. Related readings in other aspects of the Romantic movement. (Prerequisite: Mus. 221 or 222 or permission of the instructor. Next offered: 1985-86.)

Mus. 424 3 Credits — Fall
Music in the Twentieth Century (3+0) h
Trends in music since 1900. Style studies of significant works from the modern repertoire. Hindemith, Bartok, Schoenberg, Stravinsky, the avant-garde, and others. (Prerequisite: Mus. 221 or 222 or permission of the instructor. Next offered: 1986-87.)

Mus. 431 3 Credits — Alternate Spring
Counterpoint (3+0) h
Study of contrapuntal techniques by means of analysis and synthesis of pieces in contrapuntal idioms. (Next offered: 1984-85.)

Mus. 432 3 Credits — Alternate Fall
Orchestration and Arranging (3+0) h
Principles and practices of instrumentation and arranging for vocal and instrumental ensembles. (Next offered: 1985-86.)

Mus. 433 2-3 Credits — Alternate Fall
Seminar in Musical Composition (2+0, 3+0) h
Study of the development of compositional skills based upon the works of predominately twentieth-century composers. Repeatable for credit. (Prerequisites: Mus. 232 or equivalent and/or permission of instructor. Next offered: 1986-87.)

Mus. 441 3 Credits — Alternate Fall
Alaska Native Music and Social Change (3+0) h
A consideration of cultural persistence and of differential change in musical form and function. (Prerequisites: Mus. 232 or equivalent and/or permission of instructor. Next offered: 1984-85.)

Mus. 601 2 Credits — Summer
Introduction to Graduate Study (2+0)
Materials, techniques, and procedures for research in music. Examination of bibliographic sources. Required of all graduate students in Music. (Prerequisites: Provisional admission to graduate study and permission of instructor.)

Mus. 607 3 Credits — As Demand Warrants
Seminar in Elementary and Secondary General Classroom Music (3+0)
Discussion of the theoretical bases for developing objectives for general and classroom music in the elementary and secondary schools. Evaluation of current curricula, methods, and materials with respect to stated objectives. Evaluative methods in music. (Prerequisite: Permission of instructor.)

Mus. 608 2 Credits — As Demand Warrants
Seminar in Secondary Music Ed. (2+0)
An examination of current trends and problems in all aspects of secondary music education. Emphasis will be placed on curriculum development, philosophy and goals, instrumental and choral program administration, and aspects of music learning and evaluation. (Prerequisite: Permission of instructor.)

Mus. 625 1-3 Credits As Demand Warrants
Topics in Music History (1-3+0)
Detailed study of selected topic in music history and/or literature. Specific topic and number of credits to be announced in advance of course offering.

Mus. 631 3 Credits Alternate Fall
Seminar in Music Theory: History and Pedagogy (3+0)
Study of 1) historical development of music theory, and 2) music theory pedagogy (current teaching practices, and survey of available teaching materials). (Prerequisite: Permission of instructor. Next offered: 1985-86.)

Mus. 641 3 Credits Alternate Fall
Methods of Ethnomusicological Research (3+0)
Bibliography and research methods in non-Western musics. New ethnomusicological research and approaches. (Prerequisites: Mus. 441 and/or permission of instructor. Next offered: 1985-86.)

Mus. 651 2-3 Credits As Demand Warrants
Advanced Conducting and Rehearsal Techniques (2-3+0)
Study of conducting style and techniques and their application to representative compositions for different instrumental and vocal mediums. Repeatable for credit. (Prerequisites: Mus. 351 or equivalent and/or permission of instructor.)

Mus. 671 3 Credits As Demand Warrants
Psychology of Music (3+0)
Study of the relationship of music to the human mind emphasizing such factors as musical perception, pattern recognition, psychoacoustics, and related topics. (Prerequisites: Mus. 232 or equivalent and/or permission of instructor.)

Oceanography

OCN 111 3 Credits Spring
The Oceans (3+0) n
This course examines in an introductory way the classic disciplines of ocean science beginning with important definitions and a general history of oceanography. Emphasis is on descriptive biological, physical, chemical, and geological marine science. Additional topics of special interest including scuba, demonstrations of marine research instrumentation, and films of current oceanographic topics such as coastal upwelling and polar oceanography will supplement the lecture.

OCN 610 3 Credits Alternate Spring
Marine Biology (3+0)
A study of the biology of the major plant and animal groups in the sea and their roles in pelagic and benthic systems. Physical, chemical, and geological features affecting marine organisms. The role of bacteria in the sea. Zooplankton and nekton—basic biology and adaptations of selected species. The benthos—shore biota, shelf and deepsea organisms: basic biology, trophic roles, and adaptations of selected species. (Prerequisites: Degree in biology or permission of instructor. Highly recommended: courses in invertebrate zoology, ichthyology, vertebrate zoology. Next offered: 1986-87.)

OCN 615 2 Credits Alternate Fall
Physiology of Marine Organisms (2+0)
A study of the physiological adaptation of the marine environment. intertidal, pelagic, and deep benthos environment and energy flows will be discussed. (Prerequisite: Graduate standing or permission of the instructor.)

OCN 620 4 Credits Fall
Physical Oceanography (3+3)
Physical description of the sea, physical properties of sea water, methods and measurements, boundary processes, currents, tides and waves, and regional oceanography. (Prerequisite: Science or engineering degree, or permission of the instructor.)

OCN 625 2 Credits Spring
Shipboard Techniques (1+3)
A comprehensive introduction to modern oceanographic shipboard sampling and analysis techniques. (Prerequisites: Graduate standing and permission of instructor.)

OCN 629 3 Credits Alternate Fall
Methods of Numerical Simulation in Fluids and Plasma (3+0)
(Same as SPAS 629)
The fundamentals of computer simulation including time and spatial differencing and stability theory applied to partial differential equations describing convective and diffusive transport in fluids. The second part of the course will be separated into two tracks: One specializing in ocean and atmospheric dynamics and the other in the plasma state of matter. (Prerequisites: Math. 310, 421, 422 or equivalent; baccalaureate degree in physics, engineering or mathematics or equivalent; for plasma physics track: baccalaureate degree in physics including Phys. 311, 312, 331, 332 or equivalent; experience with FORTRAN.)

OCN 630 3 Credits Spring
Geological Oceanography (3+0)
History of ocean exploration and development of methods and instrumentation for exploration of ocean floors. Sample retrieving and geophysical techniques. The topography of the ocean floor. The origin of ocean basins in relation to continental drift, plate tectonics, and polar wandering. Age of the ocean basins. Major subdivisions of the ocean basins: nearshore, shelf, slope, and deep basin. Definition and classification of shorelines and coasts. Beach characteristics and cycle. Continental Shelves: their topography and sediments. Shelf origin: history interrelation with coast and beach. Slope characteristics and its origin. Deep sea floor features: marine valleys, deep channels, canyons, trenches, mounts, hills, range, fractures, and faults. Deep ocean floors: the Atlantic, the Pacific, and the Indian Oceans. The inland seas: Mediterranean etc. Ocean sediments: their characteristics and distributions. The sources and the distribution of pelagic sediments. Formation and distribution of biogenic sediments including reefs. Major types of sediments in the oceans: characteristic properties and distributions. Sediment transport systems in the oceans: waves, currents, tsunamies, submarine earthquakes, and turbidity flows. (Prerequisite: Introductory college geology or permission of instructor.)

OCN 635 3 Credits Fall
Acoustical Oceanography (3+0)
Principles and applications of underwater sound in solving oceanographic problems. The development of theory and basic concepts with emphasis on special topics such as arctic acoustics phenomena, bioacoustic and fisheries sonar. (Prerequisites: College physics and calculus and graduate standing or permission of instructor.)

OCN 640 3 Credits Alternate Spring
Fisheries Oceanography (3+0)
A description of marine processes supporting commercially important higher trophic levels (fishes and shellfish) including details of food webs and rates of organic matter transfer, natural mortality and recruitment schedules, competition, and prey-predator relationships during early life history, and distribution and abundance related to specific physical, chemical, biological, geological, and meteorological conditions in the sea. Examples taken from many of the world's commercial fisheries. (Prerequisite: OCN 650 or permission of instructor. Next offered: 1986-87.)

OCN 650 3 Credits Fall
Biological Oceanography (3+0)
A survey of biological processes emphasizing organic matter synthesis and transfer including topics essential to a basic understanding of contemporary biological oceanography. Primary and secondary production, standing stocks, distribution, and structure and dynamics of phytoplankton and zooplankton populations. The transfer of organic matter to higher trophic levels, food webs, nutrient cycling, especially but not exclusively nitrogen, phosphorus and silicon, microbiological process relevant to nutrient cycling, and heterotrophic production, benthic communities coastal ecosystems, the influence of organisms on the composition of seawater, particularly with reference to oxygen and carbon dioxide regimes. Aspects of regional oceanography. (Prerequisites: Introductory college biology and chemistry.)

OCN 660 3 Credits — **Spring**
Chemical Oceanography (3 + 0)
(Same as Chem 660)
An integrated study of the chemical, biological, and physical processes that determine the distribution of chemical variables in the sea. The distribution of stable and radio-isotopes are used to follow complex chemical cycles, with particular emphasis on the cycles of nutrient elements. The chemistry of carbon is considered in detail. The implications of the recently explored mid-ocean ridge vent system to ocean chemistry are examined. (Prerequisites: Graduate standing or permission of instructor.)

OCN 665 3 Credits — **Alternate Spring**
Microbial Biochemistry (2 + 3)
Quantitative and mechanistic aspects of the biochemical processes that micro-organisms effect in the aquatic environment. Processes will be formulated in terms of biochemical structures and specified in terms of equations derived. Although intended for students of aquatic processes, the level is appropriate to follow the first semester course in biochemistry. Modern techniques for analysis of enzyme kinetics will provide the foundation for consideration of the processes of membrane transport. (Prerequisites: Chem. 425 or equivalent; permission of instructor.)

OCN 670 2 Credits — **Alternate Fall**
Nutrient Dynamics (2 + 0)
The dynamics of nitrogen, phosphorus and silicon cycles of the world oceans and the specific processes which transfer nutrients between ecosystmes compartments will be studied. Analytical techniques employed in measurement of nutrient transfer rates will also be studied. (Prerequisite: OCN 660 and 650 or permission of instructor.)

OCN 680 3 Credits — **Alternate Spring**
Physical-Chemical Limnology (3 + 0)
A comprehensive course in physical and chemical limnology covering the basic processes and cycles in freshwater systems, including a consideration of arctic and subarctic lakes. (Prerequisites: Graduate standing, calculus, quantitative analysis or permission of instructor. Next offered: 1985-86.)

Petroleum Engineering

Pet.E. 103 2 Credits — **Fall**
Survey of the Energy Industries (2 + 0)
A comprehensive non-technical overview of global energy resources, current technology for development of energy resources, and the impact of world politics on resource distribution.

Pet.E. 205 3 Credits — **Fall**
Introduction to Petroleum Drilling and Production (3 + 0)
Fundamental principles of oil and gas well drilling, well completions, production engineering; includes field trips to Alaskan oil fields whenever possible. (Prerequisite: Math. 200.)

Pet.E. 211 1-2 Credits — **Spring**
Drilling Laboratory (0 + 3 or 6)
Measurement of physical properties of drilling mud; optional BOP certification and drilling rig operation experience during spring break. (Prerequisite: Pet.E. 205 or permission of instructor.)

Pet.E. 301 3 Credits — **Fall**
Reservoir Rock Properties (2 + 3)
Definition and measurement of the physical properties of reservior rocks; porosity, permeability, lithology, fluid saturations, relative permeability.

Pet.E. 302 3 Credits — **Spring**
Well Logging (3 + 0)
Comprehensive treatment of modern well logging methods including formation and production logging tools and techniques and basic concepts of log interpertation. (Prerequisite: Junior standing in engineering or geoscience.)

Pet.E. 305 4 Credits (old 405 - no petition) — **Spring**
Underground Fluids Behavior (3 + 3)
Chemical, physical, and thermodynamic properties of water, oil, and gas in petroleum formations; classification of petroleum reservoirs by fluid phase contents, and interpretation of PVT reports for reservoir fluid samples. (Prerequisites: Pet.E. 301, E.S. 346.)

Pet.E. 321 3 Credits — **Fall**
Advanced Thermodynamics for Petroleum Engineers (3 + 0)
A thorough study of the thermodynamics involved in the transport of petroleum fluids from the formation to the surface with an emphasis on multi-phase, multi-component equilibrium processes. (Prerequisites: Math. 302, Chem. 321 and E.S. 346 and concurrent registration in E.S. 341.)

Pet.E. 400 1 Credit — **Fall**
Practical Engineering Report (0 + 3)
Report on practical experience from petroleum engineering summer job. (Prerequisite: Senior standing in engineering or geoscience, or permission of instructor.)

Pet.E. 407 4 Credits (old 306 and petition) — **Fall**
Petroleum Production Engineering (3 + 3)
Well completion practices, workovers, surface facilities, tubulars design, sucker-rod pumping, gas lift, stimulation techniques, sand control. Laboratory includes measurement of gas and oil streams. (Prerequisite: E.S. 346 and concurrent enrollment in E.S. 341.)

Pet.E. 421 3 Credits — **Fall**
Subsurface Engineering (3 + 0)
Application of well logs to delineate reservior rock properties and its spatial variations. Estimation of petroleum in place. Impact of facies variation and depositional models for the design of production policies. Impact of formation structure on enhanced oil recovery methods. Reservoir surveillance. (Prerequisites: Pet.E. 301, 302, and Geos. 370)

Pet.E. 426 4 Credits — **Spring**
Drilling Engineering and Laboratory (3 + 3)
Principles of oil gas well drilling, drilling fluids, drilling mud, drilling problems, mud logging, drill stem testing, rig types, rig design and selection. Drilling optimization. Well blowout control. (Prerequisites: E.S. 331 and E.S. 341.)

Pet.E. 431 2 Credits — **Fall**
Natural Gas Engineering (2 + 0)
The production of natural gas and condensate reservoirs. Design of processing, transportation, distribution and flow measurement systems. (Prerequisite: Pet.E. 301 and 401.)

Pet.E. 456 3 Credits — **Spring**
Petroleum Evaluation and Economic Decisions (3 + 0)
Economic appraisal methods for oil field developmental project evaluations including risk analysis, probability, and statistics in decision making and evaluations. Case studies will be employed. (Prerequisites: Math. 202 and Pet.E. 476.)

Pet.E. 466 3 Credits — **Spring**
Petroleum Recovery Methods (3 + 0)
Discussion of flow and physiochemical principles of oil recovery by water, chemical, thermal and miscible floods. Prediction of recovery for each of these methods. (Prerequisites: Pet.E. 476 and M.E. 441.)

Pet.E. 476 3 Credits — **Fall/Spring**
Petroleum Reservoir Engineering (3 + 0)
Quantitative study and prediction of the behavior of oil and gas reservoirs under primary, secondary, and tertiary recovery mechanisms. (Prerequisites: Pet.E. 301 and Pet.E. 405.)

Pet.E. 478 2 Credits — **Spring**
Well Test Analysis (2 + 0)
Introduction to transient flow of fluids through porous media, application of solutions of the diffusivity equation of single-well and multi-well flow, pressure buildup and drawdown analysis, interference testing and log-log type curve analysis and effect of reservoir heterogeneities on pressure behavior. (Prerequisites: Pet.E. 476 and Math. 302)

Pet.E. 489 2 Credits — **Fall/Spring**
Reservoir Simulation (2 + 0)
The theory and use of computer reservoir simulation in petroleum reservoir and production engineering and incorporation detailed reservoir studies using the BOSS (Black Oil Simulation System) model from Scientific Software Corporation. (Prerequisites: Math. 310 and Pet.E. 476.)

Pet.E. 610 3 Credits Fall
Advanced Reservoir Engineering (3+0)
Advanced treatment of topics in reservoir engineering including derivation and solution of the diffusivity equation, the real gas pseudo potential, and applications of materials balance equations to water influx calculations. (Prerequisite: Pet.E. 476 or permission of instructor.)

Pet.E. 620 1 Credit Fall
Graduate Research Seminar (1+0)
Introduction to research methodology including topics on structuring research proposals, methods of experimental design, and technical report writing; will include lectures by faculty in petroleum engineering outlining their research interests. (Prerequisite: Graduate standing in petroleum engineering.)

Pet.E. 650 2 Credits Spring
Advanced Topics in Petroleum Engineering (2+0)
A series of lectures by the faculty and outside speakers covering "state of the art" technology in selected topics of interest to petroleum engineers. Among others, topics will include the subject matter of graduate courses not offered during the semester at hand. (Prerequisite: Graduate standing in petroleum engineering or permission of instructor.)

Pet.E. 661 3 Credits Spring
Advanced Well Testing (3+0)
Equations for transient flow of single phase fluids through porous media, extension to sample multiphase flow, isolated and developed multi-well flow, conventional drawdown and buildup analysis, log-log type curve analysis, interference testing, fractured wells, pulse tests, and drill stem tests. (Prerequisite: Pet.E. 476 or Pet.E. 610.)

Pet.E. 662 3 Credits Every Third Semester
Enhanced Oil Recovery (3+0)
Secondary and tertiary oil recovery processes, including waterflooding and chemical and thermal recovery methods. (Prerequisite: Pet.E. 476 or Pet.E. 610. Next offered: Spring 1986)

Pet.E. 663 3 Credits Every Third Semester
Advanced Reservoir Simulation (3+0)
Mathematical description of the reservoir, history matching, and prediction for several published case studies of reservoir simulations, class project application to simulation of an Alaskan reservoir. (Prerequisites: Advanced engineering mathematics elective and Pet.E. 610. Next offered: Fall 1986.)

Pet.E. 664 3 Credits Every Third Semester
Geothermal Reservoir Engineering (3+0)
Quantitative treatment of broad problems associated with development of a geothermal fluid reservoir system. (Prerequisite: Graduate standing in engineering discipline or approval of the instructor. Next offered: Fall 1986.)

Pet.E. 665 3 Credits Every Third Semester
Advanced Phase Behavior (3+0)
The application of molecular physics, and chemistry to the interpretation, correlation, and prediction of thermodynamic properties used in phase-equilibrium calculations. Theoretical and empirical approaches are used. (Prerequisite: Pet.E. 321 or permission of instructor. Next offered: Fall 1985.)

Pet.E. 666 3 Credits Every Third Semester
Arctic Drilling and Well Completions (3+0)
Offshore and onshore methods for drilling and completing oil and gas wells in the Arctic; problems of permafrost and ice flow, environmental considerations. (Prerequisite: Graduate standing in engineering discipline or permission of instructor. Next offered: Fall 1985.)

Philosophy

Phil. 201 3 Credits Fall and Spring
Introduction to Philosophy (3+0) h
Terms, concepts, and problems as reflected in writings of great philosophers. (Prerequisite: Sophomore standing or permission of the instructor.)

Phil. 202 3 Credits Spring
Introduction to Eastern Philosophy (3+0) h
Basic assumptions, problems and conclusions of the major philosophical traditions of the Far East. (Prerequisite: Phil. 201 or permission of the instructor.)

Phil. 204 3 Credits Fall and Spring
Introduction to Logic (3+0) h
Principles of deductive and inductive logic and application of these laws in science and other fields; brief introduction to symbolic logic and its application. (Prerequisite: Sophomore standing.)

Phil. 321 3 Credits Alternate Fall
Aesthetics (3+0) h
The nature of aesthetic experience in poetry, music, painting, sculpture and architecture; studies in relation to artistic production and the role of art in society. (Prerequisite: Phil. 201. Next offered: 1985-86.)

Phil. 322 3 Credits Alternate Spring
Ethics (3+0) h
Examination of ethical theories and basic issues of moral thought. Prerequisite: Phi. 201. Next offered: 1985-86.)

Phil. 341 3 Credits Alternate Fall
Epistemology (3+0) h
The nature of knowledge, truth and certainty. (Prerequisite: Phil. 201. Next offered: 1986-87.)

Phil. 342 3 Credits Alternate Spring
Metaphysics (3+0) h
The nature of reality comprising both ontology and cosmology. (Prerequisite: Phil. 201. Next offered: 1986-87.)

Phil. 351 3 Credits Fall
History of Philosophy and Science (3+0) h
Ancient and medieval periods. (Prerequisite: Six credits in philosophy or social science.)

Phil. 352 3 Credits Spring
History of Philosophy and Science (3+0) h
Renaissance, modern, and recent periods. (Prerequisite: Six credits in philosophy or social science.)

Phil. 471 3 Credits Alternate Fall
Contemporary Philosophical Problems (3+0) h
Ideological issues facing the modern world. (Prerequisite: Nine credits philosophy or permission of the instructor. Next offered: 1986-87.)

Phil. 481 3 Credits Alternate Spring
Philosophy of Science (3+0) h
Comparison and discussion of various contemporary methodological positions. (Prerequisite: Junior standing. Next offered: 1986-87.)

Phil. 482 3 Credits Alternate Fall
Comparative Religion (3+0) h
Seven world faiths represent answers to questions of man's duty, his destiny and his nature. (Prerequisite: Permission of the instructor. Next offered: 1985-86.)

Phil. 483 3 Credits Alternate Spring
Philosophy of Social Science (3+0) h
Comparison and analysis of various contemporary methodological positions in the social sciences. (Prerequisite: Junior standing. Next offered: 1985-86.)

Phil. 484 3 Credits Alternate Spring
Philosophy of History (3+0) h
Critical examination of the nature of history and historical inquiry. (Prerequisite: Nine credits in philosophy or social science. Next offered: 1985-86.)

Physical Education

P.E. 100 1 Credit **Fall and Spring**
Physical Activities and Instruction (0+3)
Instruction, practice, and activity in a variety of physical activities, sports, and dance in separate sections. Additional course fee required for all P.E. 100 activity classes except Varsity Athletics. General laboratory fees are $10.00, except Pistol and Rifle Marksmanship and Bowling are $35.00 each semester.

P.E. 201 2 Credits **Fall and Spring**
Concepts and Activities in Physical Fitness (2+0)
Development of knowledge of the problems, methods of achievement, and maintenance of physical fitness in the modern world. Assessment of personal fitness status, participation in selected fitness activities, and acquisition of skills in basic physical fitness activity.

P.E. 208 1 Credit (2 credits) **Fall**
Advanced Life Saving (0+3)
American Red Cross course, successful completion leading to certification by A.R.C. in Advanced Life Saving. (Prerequisite: P.E. 100, Fundamentals of Swimming or American Red Cross Basic Rescue Certification.)

P.E. 210 2 Credits delete – add 211, 213, 219 **Alternate Fall**
Fundamentals of Softball, Aquatics and Ice Sports (1+3)
An introduction to the fundamental skills, techniques, rules, strategies, safety practices, methods of class organization, drills, testing techniques, and skill analysis for softball, aquatics and snow sports. (Prerequisite: American Red Cross Basic Rescue Card. Next offered: 1984-85.)

P.E. 220 2 Credits delete - add 212, 220, 222 **Alternate Spring**
Fundamentals of Wrestling, Basketball and Track & Field (1+3)
An introduction to the fundamental skills, techniques, rules, strategies, safety practices, methods of class organization, drills, testing techniques, and skill analysis for wrestling, basketball and track. (Next offered: 1984-85.)

P.E. 230 2 Credits delete - add 216, 217, 218 **Alternate Fall**
Fundamentals of Soccer, Rhythms and Recreational Activities (1+3)
An introduction to the fundamental skills, techniques, rules, strategies, safety practices, methods of class organization, drills, testing techniques, and skill analysis for soccer, rhythms and recreational activities. (Next offered: 1985-86.)

P.E. 240 2 Credits delete - add 214, 215, 221 **Alternate Spring**
Fundamentals of Gymnastics, Snow Sports and Volleyball (1+3)
An introduction to the fundamental skills, techniques, rules, strategies, safety practices, methods of class organization, drills, testing techniques, and skill analysis for gymnastics, ice sports and volleyball. (Next offered 1985-86.)

P.E. 246 3 Credits **Fall and Spring**
Advanced First Aid (3+0)
Knowledge and skills necessary to provide efficient aid and treatment in emergencies. Progresses through the Basic, Standard, and Advanced First Aid packages of the American Red Cross. Successful completion of requirements leads to certification by the American Red Cross in Advanced First Aid. Materials Fee: $5.00

P.E. 300 1 Credit **Alternate Fall**
Advanced Theory and Techniques for Teaching Gymnastics (½+1½)
This class provides indepth study of advanced skills, strategies, and analysis in gymnastics. The course meets for 7 weeks, 4 hours per week. (Prerequisite: P.E. 240. Next offered: 1986-87)

P.E. 302 1 Credit **Alternate Fall**
Advanced Theory and Techniques for Teaching Basketball (½+1½)
This class provides indepth study of advanced skills, strategies, and analysis in basketball. The course meets for 7 weeks, 4 hours per week. (Prerequisite: P.E. 220 Next offered: 1985-86.)

P.E. 303 1 Credit **Alternate Fall**
Advanced Theory and Techniques for Teaching Ice Sports (½+1½)
This class provides indepth study of advanced skills, strategies, and analysis in teaching ice sports. The course meets for 7 weeks, 4 hours per week. (Prerequisite: P.E. 210. Next offered 1985-86.)

P.E. 304 1 Credit **Alternate Spring**
Advanced Theory and Techniques for Teaching Snow Sports (½+1½)
This class provides indepth study of advanced skills, strategies, and analysis in teaching snow sports. The course meets for 7 weeks, 4 hours per week. (Prerequisite: P.E. 240. Next offered 1986-87.)

P.E. 305 1 Credit **Alternate Fall**
Advanced Theory and Techniques for Teaching Volleyball (½+1½)
This class provides in-depth study of advanced skills, strategies, and analysis in volleyball. The course meets for 7 weeks, 4 hours per week. (Prerequisite: P.E. 240. Next offered: 1986-87.)

P.E. 306 1 Credit **Alternate Fall**
Techniques in Teaching Creative Dance (½+1½)
Designed to provide skill and practice in organizing creative dance experiences for all age groups. The emphasis is on learning techniques which will free people to create from their own movement vocabularies. There will be some emphasis on correct body alignment and techniques of moving. (Prerequisite: P.E. 230. Next offered: 1986-87.)

P.E. 307 1 Credit **Alternate Spring**
Techniques in Camping and Outdoor Recreation (½+1½)
This class provides in-depth study of advanced skills and organizational techniques in camping and outdoor recreation. The course meets for 7 weeks, 4 hours per week, and one weekend campout will be required. (Prerequisite: P.E. 230. Next offered: 1986-87.)

P.E. 308 1 Credit **Alternate Fall**
Techniques in Track and Field (½+1½)
This class provides in-depth study of advanced skills and analysis of track and field. The course meets for 7 weeks, 4 hours per week. (Prerequisite: P.E. 220. Next offered: 1985-86.)

P.E. 309 1 Credit (2 credits) **Spring**
Aquatic Instructor (½+1½)
Completion of course satisfies requirements for American Red Cross Certification in Basic Rescue and Water Safety, and certification as a Basic Swim Instructor (BSI) or Water Safety Instructor (WSI). (Prerequisites: Students must have Basic Swim Instructor, be over seventeen years of age and sophomore standing.)

P.E. 310 1 Credit **Alternate Spring**
Techniques in Teaching Folk and Square Dance (½+1½)
Techniques and practical application in organizing and teaching varying age and ability levels in folk and square dance. Dances will include partner and non-partner folk dances, some fad dances and traditional square dance, and some practice in cueing and calling will be provided. (Prerequisite: P.E. 230. Next offered: 1986-87.)

P.E. 318 3 Credits **Alternate Spring**
Motor Development and Learning (3+0)
Motor skill and behavior development from prenatal life, infancy, early childhood, later childhood, adolescence, adulthood, and through old age; issues, programs, applications, curricula, and evaluation of motor development. Differences in motor development and motor learning according to sex, body type, age, and other individual differences. Principles of motor skills learning processes related to performance and teaching models. Content intended for use by anyone involved in the care, growth, development, education, or recreation of children or adults. (Prerequisite: PSY 101 or permission of instructor. Next offered: 1985-86.)

P.E. 321 1 Credit **Fall/Spring**
Practicum in Physical Education (0+3)
Practicum course in which students will be assigned to apprentice a class at the university or with a competent supervisor within the community. The student will gradually assume increasing responsibility for organization, planning, and conducting activities under supervision. The course will be required of physical education majors in either their junior or senior year. Class may be repeated. A maximum of 2 credits may count toward departmental requirements. (Prerequisites: Appropriate P.E. 210-240, junior standing or equivalent background.)

P.E. 327 2 Credits Spring
Movement Activities for Children (2+0)
A practical background of sports, games, and fundamental movement activities appropriate for the child in the environment of the home, playground, or elementary school classroom or gymnasium. For parents, teachers, or others who work with children up to age 12. Course includes progressions in activities and participation in selected activities. (Prerequisites: Psy. 101, sophomore standing.)

P.E. 400 2 Credits Alternate Fall
Judging and Coaching Gymnastics (1+3)
Techniques for teaching, coaching, judging, and administering men's and women's gymnastics, including apparatus, tumbling, and floor exercise. (Prerequisite: Junior standing or previous gymnastic experience. Next offered: 1985-86.)

P.E. 401 2 Credits Alternate Fall
Theory of Basketball (2+0)
Techniques of playing and coaching men's and women's basketball, including theories of offense and defense, contest stragegies and psychology of individual and team play. (Prerequisites: P.E. 302 and junior standing. Next offered: 1986-87.)

P.E. 406 3 Credits Alternate Fall
Methods of Teaching Physical Education (2+3)
Philosophy, curriculum development, methods for facilitating learning and controlling behavior, measurement and evaluation, observations, and teaching laboratories in elementary and secondary school physical education. (Prerequisites: Psy. 101, Ed. 312, Ed. 314. Next offered: 1985-86.)

P.E. 408 2 Credits Alternate Spring
Aquatics Program Management (2+0)
Aquatic program planning and implementation, competitive swim team coaching and administration, and management of swimming pools. (Prerequisite: P.E. 109 or 309. Next offered: 1986-87.)

P.E. 411 3 Credits Every Third Semester
Sport and Physical Activity in American Society (3+0)
Role of sport and physical activity in society from ancient to contemporary times, development of school programs, overview of scientific bases for physical performance, vocational opportunities in related fields, and current issues in sport and physical education. (Prerequisite: junior standing. Next offered Fall 1986.)

P.E. 412 3 Credits Alternate Fall
Principles and Problems in Athletic Coaching (3+0)
Philosophy and objectives of athletic competition at various age levels. The roles and responsibilities of the athletic coach. Problems of athletic coaching and management of athletes and their training. Content appropriate for those who plan to take leadership or coaching roles in any athletic programs, in schools, or in community recreation. (Prerequisite: Junior standing. Next offered: 1986-87.)

P.E. 421 3 Credits Alternate Fall
Physiology of Exercise (3+0)
Physiological adaptations of the human body to muscular activity in exercise and sports, practical applications of physiological principles to training programs for fitness, competitive sports, and physical education. (Prerequisite: Biol. 111-112. Next offered: 1986-87.)

P.E. 425 3 Credits Alternate Fall
Administration in Physical Education and Athletics (3+0)
Principles and problems of planning, organizing, directing, and evaluating school programs in physical education, intramural sports, and interschool athletics. (Prerequisite: Junior standing. Next offered: 1985-86.)

P.E. 432 3 Credits Alternate Fall
Biomechanics of Physical Performance (3+0)
Mechanical and muscular analysis of human movement patterns, especially in sport and physical education, anatomical concepts, and physical laws applied to joint and muscular action. (Prerequisites: Biol. 111-112, Math. 107. Next offered: 1985-86.)

P.E. 437 3 Credits Alternate Spring
Adapted Programs of Physical Activity (3+0)
Theory and practical guidelines for developing adapted movement activities and programs for persons who are impaired, disabled, or handicapped; "mainstreaming" such individuals in to regular programs in physical education and recreation. (Prerequisite: Psy. 101 or permission of instructor. Next offered: 1986-87.)

P.E. 440 3 Credits Spring
Care and Prevention of Athletic Injuries (3+0)
Scientific bases for the care and prevention of injuries, related to participation in sports and physical activity, rationale and strategies for taping and wrapping for injury prevention and rehabilitation, techniques in pre-activity conditioning and post-injury reconditioning, and equipment safety. (Prerequisites: Biol. 111 and 112, P.E. 201 or permission of instructor.)

P.E. 442 3 Credits Alternate Spring
Measurements and Evaluation in Physical Education (3+0)
Theory and application of the evaluation process in Physical Education including basic statistics, formation of measureable behavorial objectives, written test construction, survey of fitness and skill tests, their selection, administration and interpretation of results, and the use of basic computer programs to calculate various statistical values. (Prerequisites: P.E. 210, 220, 230, 240, and junior standing. Next offered: 1986-87.)

Physics

Phys. 103 4 Credits Fall
Phys. 104 4 Credits Spring
College Physics (3+3) n
Unified classical and modern physics. Laboratory Fee: $5.00 (Prerequisite: High school algebra and geometry.)

Phys. 201 3 Credits Fall
Physical Science for Education Majors (3+0) n
Preparation of education majors for teaching physical science concepts and the use of science materials (primarily grades one through six) that are presently being introduced in the Alaskan school systems. Subjects covered are astronomy, chemistry, and physics.

Phys. 211 4 Credits Fall and Spring
Phys. 212 4 Credits Fall and Spring
General Physics (3+3) n
Classical physics using calculus and requiring at least concurrent registration in Math. 201. Intended for majors in mathematics, physical sciences, and engineering. Laboratory Fee: $5.00

Phys. 213 3 Credits Spring
Elementary Modern Physics (3+0) n
Elementary-level modern physics, including special relativity, atomic physics, nuclear physics, solid-state physics, elementary particles, simple transport theory, kinetic theory, and concepts of wave mechanics. (Prerequisites: Phys. 211 and 212 or the equivalent.)

Phys. 275 3 Credits Alternate Fall
Phys. 276 3 Credits Alternate Spring
Astronomy (3+0) n
Science elective for the general student. Fall semester: The solar system, laws of motion, nature of radiation, astronomical instruments, the earth, the moon, planets, comets and meteors, and cosmogony. Spring semester: Stellar astronomy, physical properties and distribution of stars, interstellar matter, evolution of stars, galactic structure, and cosmology. Evening demonstrations both semesters. (Prerequisites: Sophomore standing, high school algebra and trigonometry, Physics 275 for Physics 276 or permission of instructor. Next offered: 1985-86.)

Phys. 311 4 Credits Alternate Fall
Mechanics I (4+0) n
Newtonian mechanics, motion of systems of particles, rigid body statics and dynamics, moving and accelerated coordinate systems, and introduction to Lagrangian mechanics. (Prerequisite: Phys. 211 or permission of instructor. Next offered: 1985-86.)

Phys. 312 4 Credits Alternate Spring
Mechanics II (4+0) n
Mechanics of deformable media, wave motion, acoustics, introduction to tensors, rigid body dynamics, and theory of small vibrations. (Prerequisite: Phys. 311 or permission of instructor. Next offered: 1985-86.)

Phys. 313 4 Credits Alternate Fall
Thermodynamics and Statistical Physics (4+0) n
Thermodynamic systems, equations of state, the laws of thermodynamics, changes of phase, thermodynamics of reactions, kinetic theory, and introduction to statistical mechanics. (Prerequisite: Phys. 212 or permission of instructor. Next offered: 1986-87.)

Phys. 331 3 Credits Fall
Phys. 332 3 Credits Spring
Electricity and Magnetism (3+0) n
Electrostatics, dielectrics, magnetostatics, magnetic materials, and electromagnetism. Maxwell's equations, electromagnetic waves, radiation, physical optics, and selected topics from electronics. (Prerequisites: Phys. 212 and Math. 202.)

Phys. 381 2 Credits Alternate Fall
Phys. 382 2 Credits Alternate Spring
Physics Laboratory (0+6) n
Laboratory experiments in classical and modern physics. (Prerequisite: Phys. 213 or permission of instructor. Next offered: 1986-87.)

Phys. 411 4 Credits Alternate Fall
Phys. 412 4 Credits Alternate Spring
Modern Physics (4+0) n
Relativity, elementary particles, quantum theory, atomic and molecular physics, x-rays, and nuclear physics. (Prerequisites: Phys. 213, Math. 302 and Math. 314, or permission of instructor. Next offered: 1985-86.)

Phys. 445 3 Credits Alternate Spring
Solid State Physics and Physical Electronics (3+0) n
Theory of matter in the solid state and the interaction of matter with particles and waves. (Prerequisites: Phys. 213, Math. 302 and Math 314, or permission of the instructor. Next offered: 1986-87.)

Phys. 462 4 Credits Alternate Fall
Geometrical and Physical Optics (3+3) n
Geometrical optics, interference and diffraction theory, non-linear optics, Fourier optics, and coherent wave theory. (Prerequisites: Phys. 104 or Phys. 212, Math. 202 and at least concurrent registration in Math. 302. Next offered: 1986-87.)

Phys. 611 3 Credits Alternate Fall
Phys. 612 3 Credits Alternate Spring
Mathematical Physics (3+0)
(Same as Math. 611-612)
Advanced consideration of such topics as transform methods, asymptotic methods, Green's function, Sturm-Liouville Theory, conformal mapping, and calculus of variations with applications to problems arising in physics. (Prerequisites: Math. 422 and permission of the instructor. Next offered: 1985-86.)

Phys. 621 3 Credits Alternate Fall
Classical Mechanics (3+0)
Lagrange's equations, two-body problem, rigid body motion, special relativity, canonical equations, transformation theory, and Hamilton-Jacobi method. (Admission by arrangement. Next offered: 1986-87.)

Phys. 622 3 Credits Alternate Spring
Statistical Mechanics (3+0)
Classical and quantum statistics of independent particles, ensemble theory, and applications. (Admission by arrangement. Next offered: 1986-87.)

Phys. 631 3 Credits Alternate Fall
Phys. 632 3 Credits Alternate Spring
Electromagnetic Theory (3+0)
Electrostatics, magnetostatics, Maxwell's equations, and potentials. Lorentz equations, field energy, gauge conditions, retarded potentials, waves, radiation, tensor formulations, and non-Maxwellian electrodynamics. (Admission by arrangement. Next offered: 1986-87.)

Phys. 651 3 Credits Alternate Fall
Phys. 652 3 Credits Alternate Spring
Quantum Mechanics (3+0)
Schrodinger's equations, operator formalism, correspondence principle, central force problems, perturbation theory, quantumstatistical mechanics and applications of quantum mechanics to collision problems, radiation, and spectroscopy. (Admission by arrangement. Next offered: 1986-87.)

Phys. 677 Credits Arr. As Demand Warrants
Phys. 678 Credits Arr. As Demand Warrants
Atomic and Molecular Processes
Selected topics in collision theory, radiation theory, atomic and molecular structure and reactions, and experimental techniques of atomic and molecular physics. (Admission by arrangement.)

Political Science

P.S. 101 3 Credits Fall and Spring
Introduction to American Government and Politics (3+0) s
A survey of the principles, institutions, and practices of American national government. The Constitution and federalism, interest groups, parties, public opinion, and elections; the powers and functions of the three branches of national government.

P.S. 102 3 Credits Fall and Spring
Introduction to American Government and Politics (3+0) s
A survey of outstanding problems confronting government in areas of defense, energy, economic policy, civil rights, technology, social welfare, business regulation, pollution, and education. Analysis of how policy is made and implemented by government agencies.

P.S. 201 3 Credits Fall
Comparative Politics: Methods of Political Analysis (3+0) s
Modern methods of analyzing political behavior and processes on a cross-national basis; emphasis is placed on the roles of executive, legislative and judicial systems, political parties, and pressure groups, and current concepts of political development. Specific topics to be covered in different semesters include: A) Liberal democratic regimes of Western Europe and North America, including discussion of the preconditions for liberal societies. B) Authoritarian regimes of Europe, Latin America, and the Middle East, including totalitarianism and autocracy. C) The politics of development and the theories of development, modernization and dependency, with focus on the countries of the Third World. (This course may be repeated for a maximum of 6 credits.)

P.S. 202 3 Credits Spring
Comparative Politics: Contemporary Doctrines and Structures (3+0) s
Analysis of conflicting approaches to the solution of social and political problems with emphasis on nations employing various forms of ideological systems, including socialism, fascism, and controlled or tutelary democracy. Specific topics to be covered in different semesters include: A) Authoritarian regimes of Europe, Latin America, and Africa, including military and civilian dictatorships and tyrannies. B) Totalitarian regimes including Eastern Europe under communism and fascism, the U.S.S.R., Nazi Germany, and revolutionary systems. C) Less developed countries of the Third World and the ideological underpinnings of modernization, mobilization, and development. (This course may be repeated for a maximum of 6 credits.)

P.S. 210 3 Credits Spring
Alaska Government and Politics (3+0) s
A comprehensive introduction to government and politics in Alaska. Topics include: Alaska's political history as a territory and state, the Alaska Constitution, Alaska political parties, interest groups, elections, public opinion, the Governor, Legislature, Judiciary and state administration; local government in Alaska, and Alaska public policy issues.

P.S. 211 3 Credits Alternate Fall
State and Local Government (3+0) s
Organization, functions, and policies of state and local governments in the United States; Federalism and intergovernmental relations, and comparative analysis of the politics of the 50 states. (Next offered: 1985-86.)

P.S. 212 3 Credits Alternate Spring
Introduction to Public Administration (3+0) s
(Same as Just. 259)
Theory, principles, and practices of public administration, especially as applied to municipal agencies. Study of planning and organization: decision making and the formation and administration of public policy. (Next offered: 1986-87.)

P.S. 263 3 Credits Fall and Spring
Alaska Native Politics (3+0) s
An introduction to the political development, organization, interests and activities of Alaska Natives; treatment of the history of white-Native contact, the evolution of Native leadership, village and regional government, and the role of Native brotherhoods culminating in the Alaska Federation of Natives.

P.S. 301 3 Credits Alternate Fall
American Presidency (3+0) s
A study of the institution of the presidency: the gradual growth of formal and informal means of presidential power, the influence that different presidents have brought to the office, the significance of presidential style and character, presidential elections, and suggestions to reform the institution of the presidency. (Prerequisite: P.S. 101 or consent of instructor. Next offered: 1986-87.)

P.S. 302 3 Credits Alternate Spring
Congress and Public Policy (3+0) s
A study of the American Congress with attention given to the historical setting of the institution: the process of decision-making election and training of Congressmen, influences on legislative policymaking by other branches and interest groups, and monitoring by Congress of national policies. (Prerequisite: P.S. 101. Next offered: 1985-86.)

P.S. 310 3 Credits Alternate Fall
The Politics of Post-Industrial States (3+0) s
Comparative study of the political systems of societies which have completed their industrial revolutions. Topics include: The problem of the welfare state, the no-growth society, the end of ideology, the loss of the work ethic, identity in homogeneous societies, war and peace in an industrialized context, etc. Countries included: The U.S., Great Britain, Soviet Union, Germany, Japan. (Prerequisite: P.S. 101 or 102 or consent of instructor. P.S. 201 strongly recommended. Next offered: 1985-86.)

PS 311 3 Credits Alternate Spring
Government and Politics of the Soviet Union (3+0) s
A survey of Soviet institutions and political processes, viewed in both an historical and a comparative perspective. (Prerequisites: PS 201 or permission of instructor. Next offered: 1985-86.)

PS 312 3 Credits Alternate Fall
Government and Politics of China (3+0) s
A survey of modern Chinese politics and society. Examination of government institutions, political processes, and foreign relations, including U.S.-China relations (Prerequisites: PS 201 or consent of instructor. Next offered: 1986-87.)

P.S. 315 3 Credits Alternate Spring
American Political Thought (3+0) s
Political ideas and major political movements in the United States from the 17th century to the present: Puritanism, revolutionary thought, Constitutionalism, nature of the Union, utopianism, the Progressive movement, pragmatism, socialism, and conservatism. (Prerequisite: P.S. 101 or consent of instructor. Hist. 131 and 132 strongly recommended. Next offered: 1986-87.)

P.S. 321 3 Credits Fall
International Politics (3+0) s
Introduction to the international political system; evolution, process, concepts, dynamics, problems, and techniques for resolving conflicts. A survey of international political theory, including classical, geopolitical and behavioral approaches. (Prerequisites: P.S. 101 and 102 or permission of instructor.)

P.S. 322 3 Credits Spring
International Law and Organizations (3+0) s
Introduction to international law, regional and international organizations, non-state actors in the global community, arms control and disarmament, and international political integration. (Prerequisites: P.S. 101 and 102 or permission of instructor.)

P.S. 325 3 Credits Spring
Native Self Government (3+0) s
(Same as ANS 325)
Comparative study of indigenous political systems, customary law and justice in Native Alaska with emphasis on the organization of Native self-government under Federal Indian Law and under Alaska state chartered local government options and on comparisons between Alaska Native political developments and those of tribes in the contiguous 48 states. (Prerequisites: Hist. 100, P.S. 263.)

P.S. 400 3 Credits Fall
Political Science Research Methods (3+0) s
A survey of the methods, techniques, applications, and concerns important in political science and policy research. Focus on research design, and planning; sampling, survey research methods, content analysis, observation, and field research, aggregate data analysis, and description of data. (Prerequisites: P.S. 101, 102 or permission of instructor.)

P.S. 401 3 Credits Alternate Spring
Political Behavior: Organizations (3+0) s
The behavior of organizations and groups in the American political process, focusing on political parties, labor unions, business, and ethnic associations. Development and change, characteristics, and policies of non-governmental organizations. Class research project on the impact of organizations in modern political life. (Prerequisites: P.S. 101, 102 and 400 or permission of instructor. Next offered: 1986-87.)

P.S. 402 3 Credits Alternate Spring
Political Behavior: Individuals (3+0) s
An examination of attitudes and behavior patterns relevant to politics and the nature of political activity in the electorate. Topics include the learning and transmission of political attitudes, beliefs and values, public opinion in the U.S., the dynamics of the decision whether, and for whom to vote. Class research project on the impact of political opinions, attitudes, beliefs, and values in modern political life. (Prerequisites: P.S. 101 and 102 or permission of instructor; P.S. 400 strongly recommended. Next offered: 1986-87.)

PS 403 3 Credits Alternate Spring
Public Policy (3+0) s
An examination of the nature of public policy with discussion of the way in which the policy process works and how policy analysis is carried out. Illustrations of policy issues and analyses will be drawn from recent cases including recent Alaska cases. (Prerequisites: PS 101 and junior standing. Next offered: 1985-86.)

P.S. 411 3 Credits Alternate Fall
Classical Political Theory (3+0) h
Political ideas from ancient Greece, Rome, and the Judaeo-Christian tradition, focusing on the role of the individual and the state, political ideals, and actual forms of government, religious ideas, and movements as they bear on political thought. Analysis of the theories of Plato, Aristotle, Cicero, Augustine, and Thomas Aquinas. (Prerequisites: P.S. 101 and 102 or consent of instructor. Next offered: 1985-86.)

P.S. 412 3 Credits Alternate Spring
Modern Political Theory (3+0) s
Political ideas from Machiavelli to Marx and Lenin. Analysis of the problems of the development and change of the modern nation state system through the writings of the following theorists: Machiavelli, Hobbes, Locke, Rousseau, Burke, J. S. Mill, Marx, and Lenin. (Prerequisites: P.S. 101 and 102 or consent of instructor; P.S. 411 strongly recommended. Next offered: 1985-86.)

P.S. 415 3 Credits Alternate Fall
Contemporary Political Theory (3+0) s
A study of contemporary democratic theory. Theories of liberal democracy, radical critiques of liberal democracy and theories of participatory democracy will be analyzed. Evidence from contemporary political and social research will be brought to bear on these theories. (Prerequisites: P.S. 101 and 102 or permission of instructor; P.S. 412 strongly recommended. Next offered: 1986-87.)

P.S. 435 3 Credits Alternate Fall
The Supreme Court and the American Legal System (3 + 0) s
The role of the Supreme Court in the development of American law with particular emphasis on the social, political, and economic factors which influence the behavior of courts. Focus on the evolution of the federal system over time. Some use of case analysis in a limited introduction to Constitutional law. (Prerequisites: P.S. 101 and 102 or permission of instructor. Next offered: 1986-87.)

P.S. 436 3 Credits Alternate Spring
The Courts and Civil Liberties (3 + 0) s
Origin and development of civil and political liberties; responsibility of the branches of government and the people for their maintenance. Cases and literature bearing on protection of constitutionally guaranteed rights with particular reference to the period since 1868. (Prerequisite: P.S. 101. Next offered: 1986-87.)

P.S. 437 3 Credits Alternate Spring
Foreign Policy (3 + 0) s
Study of the principles and practices of U.S. foreign policy in the post-war world. Focus on development of policy (including domestic as well as foreign influences), administration of political and military policies, policy coordination and evaluation of policy effectiveness in the nuclear age. (Prerequisites: P.S. 101 and 102 or permission of instructor. Next offered: 1985-86.)

P.S. 475 3 Credits Fall and Spring
Internship in Public Affairs (3 + 0)
Designed to give carefully selected undergraduates and/or graduates the opportunity to do practical and meaningful work with governmental agencies or civic action groups. Admission by permission of the instructor.

P.S. 480 1-3 Credits Fall and Spring
Model United Nations (1-3 + 0) s
The history, organization, function, and procedures of the United Nations. An introduction to the UN through research on member country's behavior, simulation, and training in the policies and procedures of international administration. Can be taken for any combination of parts A, B, C. The assignment of credits can be variable, from one to three, dependent on requirements undertaken by the student. This assignment is to be made at the time of registration for the course.

P.S. 480A Model U.N.: Member Nations Fall
Introduction to United Nations organization and procedures; background research on a member nation of the UN. 1 credit (may be repeated for a maximum of 2 credits).

P.S. 480B Model U.N.: Simulation Spring
Introduction to simulation in international policymaking and administration, application of simulation exercises, focusing on a UN member nation — development of policy positions, training in committee rules, procedures, and formulation of strategy. 1 credit (may be repeated for a maximum of 2 credits).

P.S. 480C Model U.N.: Conference Participation Spring
Participation in the annual session of the Model United Nations of the Far West. 1 credit (may be repeated for a maximum of 2 credits). (Prerequisite: P.S. 321 or permission of instructor.)

P.S. 481 3 Credits As Demand Warrants
Geopolitics and the International Environment (3 + 0) s
A study of the environment and the influences of geopolitics in the global system. An assessment of topography, demography, natural resources, technology, economic development, and their impact on the international environment. An evaluation of cooperative efforts, needs for reform, with an outlook for the future. (Prerequisites: P.S. 101 and 102 or permission of instructor; P.S. 321 strongly recommended.)

Psychology

Psy. 101 3 Credits Fall and Spring
Introduction to Psychology (3 + 0) s
Fundamentals and basic principles of general psychology emphasizing both the natural science orientation and the social science orientation including the cultural, environment, heredity, and psychological basis for integrated behavior; visual perception and its sensory basis; audition and the other senses; motivation and emotion; basic processes in learning, problem solving, and thinking; personality; psychological disorders; and the prevention, treatment, and therapeutic strategies.

Psy. 210 3 Credits Spring
Cross-Cultural Psychology (3 + 0) s
A survey of the concepts, premises, and methods of cross-cultural psychology emphasizing its use in testing, extending, and refining psychological theories developed in Western settings. Topics include perceptions, cognition, social behavior, psychopathology, and social change as they relate to cultural variation. (Prerequisite: Psy. 101.)

Psy. 230 3 Credits Alternate Fall
Psychology of Adjustment (3 + 0) s
Study of the psychology of adjustment, growth, and creativity, including advances in personal psychology, understanding personality patterning, and an exploration of burgeoning techniques and methods for furthering creative potential. (Prerequisite: Psy. 101. Next offered: 1985-86.)

Psy. 240 3 Credits Fall and Spring
Developmental Psychology in Cross-Cultural Perspective (3 + 0) s
The development of persons is examined from both a psychological and cross-cultural perspective. Key topics will be the development of cognition, personality, and social behavior with attention to relevant research on those cultures found in Alaska. (Prerequisite: Psy. 101.)

Psy. 250 3 Credits Fall and Spring
Introductory Statistics for Behavioral Sciences (3 + 0)
(Same as Soc. 250)
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. (Prerequisite: Psy. 101.)

Psy. 304 3 Credits Fall
Personality (3 + 0) s
(Same as Soc. 304)
Psychological and social/cultural determinants of personality formation including appropriate theories in both areas. (Prerequisite: Psy. 101.)

Psy. 330 3 Credits Spring
Social Psychology (3 + 0) s
(Same as Soc. 330)
An analysis of inter-group relationships in terms of process and value orientation, their influences on the personality, and the various aspects of collective behavior on group and person. Of special concern are those aspects of social interaction that have cultural and intercultural variation. (Prerequisite: Psy. 101 or Soc. 101 or junior standing.)

Psy. 340 3 Credits Fall
Abnormal and Deviant Behavior (3 + 0)
(Same as Soc. 340)
Psychological and sociological factors are combined in the study of the causes and consequences of abnormal and deviant behavior, focusing on awareness of the diverse forms and patterns of abnormal and deviant behavior, investigation of causes, consideration of types of intervention or treatment, and application in rural and cross-cultural setting. (Prerequisite: Psy. 101.)

Psy. 350 3 Credits Alternate Spring
Comparative Psychology (3 + 0) s
An integrated multidisciplinary behavioral approach to the study of comparative psychology emphasizing the basic premises, causal factors, functional consequences and interrelationships, and synthesis of animal behavior and ethology in the development and maintenance of behavioral patterns extant within both individual organisms and social groups. (Prerequisites: Biol. 105-106, Psy. 101, or permission of instructor. Next offered: 1986-87.)

Psy. 370 3 Credits Alternate Fall
Drugs and Drug Dependence (3+0) s
(Same as Soc. 370.)
A multidisciplinary approach to the study of drugs and drug abuse emphasizing acute and chronic alcoholism, commonly abused drugs, law enforcement and legal aspects of drug abuse, medical uses of drugs, physiological aspects of drug abuse, psychological and sociological causes and manifestations of drug abuse, recommended drug education alternatives and plans, and the treatment and rehabilitation of acute and chronic drug users. (Prerequisite: Psy. 101 or Soc. 101 or permission of instructor. Next offered: 1985-86.)

Psy. 380 3 Credits Alternate Fall
Human Behavior in the Arctic (3+0) s
A study of human behavior as it relates to cold climates. Emphasis will be placed on living systems in Alaska and behavioral characteristics that have to do with stress and isolation. Material will include structural design as related to behavioral research. (Prerequisite: Psy. 101. Next offered: 1986-87.)

Psy. 440 3 Credits Alternate Spring
Learning (3+0) s
Survey of theory and research on the fundamentals of learning. Topics to be covered include: animal learning, classical conditioning, instrumental learning, discrimination learning, biological constraints on learning, and cross-cultural differences in learning styles. (Prerequisite: Psy. 101. Next offered: 1985-86.)

Psy. 445 3 Credits Fall
Community Psychology (3+0) s
Community psychology foundations to include community assessment and consultation with regard to areas for study, surveys, evaluation of services, and use of results for programming. During the community consultation portion, education, prevention, and service issues are covered with particular attention given to rural and small community assessment and change, especially as it applied to Alaska. (Prerequisites: Psy. 101, Soc. 101, SWK 201.)

Psy. 450 4 Credits Spring
Experimental Psychology (2+6) s
An integrated approach to the study of experimental psychology. Emphasis will be placed on the research methodologies and techniques extant in the diverse areas of experimental psychology. Students will engage in the design, execution, and analysis of individual projects involving both animal and human subjects, which relate to fields of current research interest in psychology. (Prerequisites: Psy. 101, Psy. 250 or A.S. 301, and C.S. course(s) strongly recommended and/or permission of instructor.)

Psy. 460 4 Credits Alternate Fall
Physiological Psychology (3+3) s
An integrated multidisciplinary approach to the study of physiological psychology — neuroanatomy and neurophysiology — emphasizing the basic principles, cortical and subcortical organization, functional mechanisms, and the physical-chemical foundations extant in the physiological bases of behavior with special reference to such disciplines as neuroanatomy, neurochemistry, and electrophysiological measures employed in the study of behavior and brain activity; research methods and techniques, and extensive exploration into areas of current research interest, including brain dynamics, the neural bases of learning, the neural substrates of emotion and motivation, states of consciousness, and stress and psychosomatic relationships. (Prerequisite: Psy. 101, or permission of instructor. Next offered: 1985-86.)

Psy. 470 3 Credits Alternate Fall
Sensation and Perception (3+0) s
An integrated psychophysiological inquiry into the study of sensation and perception emphasizing the essential principles, functions and organization, fundamental mechanisms, and the structural complexity extant in the sensory physiology of the special sensory processes — audition, gustation, kinethesis, olfaction, proprioception, somesthesis, and vision — as well as an examination of the theoretical models and systems of perception with special reference to the biological, cultural, developmental, hereditary, physiological, psychological, and social effects on the interpretation of perceptual and sensory phenomena. (Prerequisite: Psy. 101, Psy. 460, and Biol. 105-106 or Biol. 111-112 strongly recommended; and/or permission of instructor. Next offered: 1986-87.)

Psy. 473 3 Credits Fall
Social Science Research Methods (3+0) s
(Same as Soc. 473)
Techniques of social research: sampling, questionnaire construction, interviewing and data analysis in surveys; field and laboratory experiments, and attitude scaling. (Prerequisite: Psy. 250 or Soc. 250).

PSY 610 3 Credits Fall
Alcohol: Pharmacology and Behavior (3+0)
A multidisciplinary approach to the study of alcohol abuse and alcoholism which incorporated the biomedical, epidemiological, genetic, pharmacological, psychological, social, andd cultural bases. (Prerequisite: Permission of Instructor)

PSY 615 3 Credits Fall
Drug Action: Physiology and Behavior (3+0)
A multidisciplinary approach to the study of drugs and drug abuse which emphasizes the biomedical, epidemiological, genetic, pharmacological, psychological, and sociological factors extant in drug use and misuse. (Prerequisite: Permission of Instructor)

PSY 618 3 Credits Spring
Community Treatment Alternatives (3+0)
An examination of the role of community in the treatment of mental health problems among indigenous or ethnic groups. It will focus on bringing to bear the resources of the community on the healing process. (Prerequisite: Permission of Instructor)

PSY 620 3 Credits Spring
Treatment of Drug and Alcohol Dependency (3+0)
An examination of the treatments available for drug and alcohol abuse. Both medical and psychological treatments will be studied. Medical treatments will include abrupt, gradual, and substituting techniques. Psychological techniques will include traditional Western therapies as well as other less traditional approaches. (Prerequisite: PSY 610 or 615)

PSY 625 3 Credits Spring
Prevention of Alcohol and Drug Dependency (3+0)
A study of the various ways to prevent alcohol dependency, especially among indigenous peoples or in ethnic groups. There will be an emphasis on cross-cultural approaches to the prevention of dependency. (Prerequisite: Permission of Instructor)

PSY 630 3 Credits Fall
Community Psychology (3+0)
The current status of community psychology with an analysis of what synergistic community is, its diverse forms across cultures, and delineates the most common approaches to the theory, research, and practice of community psychology. The course finishes with an analysis of prevention, theory and interventions in communities. (Prerequisite: Permission of Instructor)

PSY 635 3 Credits Spring
Field-Based Research Methods (3+0)
A presentation of methods used in doing cross-cultural social research in community settings. The emphasis is on the formal description of the interaction between persons and their environments. The course will present a wide variety of designs, analyses, and conceptual approaches appropriate to improving our general understanding of behavior in communities. Both quantitative and qualitative methods will be presented in the context of carrying out individual research projects. (Prerequisite: Permission of Instructor)

PSY 646 3 Credits Fall
Consultation (3+3)
(Same as SOC 646)
Experiences and training in consultation skills as a professional who can be looked to for expert help in specific areas related to their preparation in community psychology and related disciplines. Consultation as problem solving, as indirect service and as a colleague relationship in behavior dynamics, personal and interpersonal relationships, communication skills and community network support services is emphasized. (Prerequisite: Permission of Instructor)

PSY 650 3 Credits Fall
Cross-Cultural Psychopathology (3+0)
The etiology and treatment of different forms of major and minor mental illnesses across a specific group of cultures: Western, Native, American, Oriental, and African. Students will learn to conceptualize madness and its diagnosis using a variety of cultural formats. (Prerequisite: PSY/SOC 340 and/or permission of instructor)

PSY 655 3 Credits Spring
Healing: Implications for Clinical/Community Practice (3+0)
A presentation of healing across a variety of cultures: Native American, Western, African, Polynesian, and Oriental. The course will emphasize the preparation and education of healers, their roles and work, and integration within a community. Analyses and implications for the practice of preparation for community psychology roles will be stressed. (Prerequisite: Permission of Instructor)

PSY 660 3 Credits Fall
Principles of Individual Counseling (3+0)
Counseling techniques and procedures in education, social work, and on a limited basic, clinical psychology; their applications by the classroom teacher and guidance specialist in assisting students with adjustment problems within a normal range. (Permission of Instructor)

PSY 661 3 Credits Spring
Cross-Cultural Counseling (3+0)
An examination of the ethnic and cultural issues that affect the counseling setting, interaction, and outcome. There will be a review of the literature dealing with intercultural counseling, discussions of workable methods that have been used in such counseling, and examinations of target populations with whom the counselor may be involved, especially in Alaska. (Prerequisite: Permission of Instructor)

PSY 663 4 Credits Fall
Assessment and Practicum (3+3)
Designed to survey the most common methods of individual, family, couples, and community assessment. Cross-cultural issues of test fairness and design, content, and administration will be examined. This course also includes a practicum for students to have contact with professionals doing assessments in each of the surveyed areas. (Prerequisite: Permission of Instructor)

PSY 664 3 Credits Spring
Behavior Therapy (3+0)
A comprehensive examination of behavior therapy and its associated techniques. The philosophical and scientific basis for behavior therapy will be studied as well as specified procedures such as systematic desensitization, assertive training, behavior modification, and others. Students will practice such techniques so as to gain facility with the skills involved. (Prerequisite: Permission of Instructor)

PSY 665 3 Credits Alternate Fall
Psychoanalytic Theory and Clinical Method (3+0)
Psychoanalytic theory and the study of lives are presented to acquaint the student with the analysis of life histories or psychoanalytic perspective. Students study the therapeutic procedures of Freud, Jung, Searles, Sullivan, Lacan, and object relations theorists. (Prerequisite: Permission of Instructor)

PSY 666 3 Credits Fall
Family and Network Therapy (3+0)
Survey of concepts and theories of function and dysfunction in the area of couples and families as social networks. In addition, it provides an introduction to the skills necessary for one who would intervene in these systems. (Prerequisite: Permission of Instructor)

PSY 667 3 Credits Alternate Fall
Existential Psychotherapy (3+0)
An in-depth examination of the methods of humanistic and existential therapeutic approaches. The major theorists examined are: Carl Rogers, Edmund Husserl and associated therapeutic methods; R.D. Laing, and cultural forms of therapy; Buddist, native cultural revitalization. (Prerequisite: Permission of Instructor)

PSY 668 3 Credits Spring
Crisis Intervention (3+0)
An overview of the development of crisis theory that examines major assumptions, characteristics, and stages of a crisis situation. Counselor training issues and descriptive intervention techniques with respect to assessing individuals in crisis will be discussed. Examining specific types of crises encountered within the community and strategies for handling those crises situations will be focused upon in depth. Class activities will include utilizing skills in brief treatment through role-playing of crises situations. (Prerequisite: Permission of Instructor)

PSY 670 3 Credits Spring
Advanced Cross-Cultural Psychology (3+0)
Culture's impact on the basic psychological processes and human behavior in general. Topics covered include perception, cognition, personality, abnormal behavior, and social psychology. This course emphasizes that no culture exists in isolation and considers that fact when looking at traditional topics in psychology. As such the course draws heavily on data from sociology and anthropology. Also, as much evidence as is available from those ethnic groups and subcultures in Alaska will be the basic material for the course. (Prerequisite: Permission of Instructor)

PSY 674 3 Credits Spring
Group Counseling (3+0)
Kinds and types of groups with emphasis on methods, problems and needed skills in working with groups in a counseling situation. (Prerequisite: Permission of Instructor)

PSY 677 3 Credits Spring
Psychological Assessment - Intelligence (3+0)
A focus on methods of psychological assessment concerning intelligence. Initially the concept of intelligence will be surveyed as well as its many multicultural implications. The latter part of the course will enable students to gain familiarity with some of the more widely-used intelligence assessment procedures and be particularly concerned with minority issues and the concept of intelligence. (Prerequisite: Permission of Instructor)

PSY 678 3 Credits Spring
Psychological Assessment - Personality (3+0)
An examination of current practices, issues, and problems in the rapidly developing field of personality assessment. Particular emphases will be paid to problems of multicultural personality concepts and evaluations. On-hands experience will be required. (Prerequisite: Permission of Instructor)

PSY 683 3 Credits Spring
Biological Bases of Behavior and Behavioral Change (3+0)
A review and extension of neuroanatomy and neurophysiology which emphasizes the basic function and structure of both the central and peripheral nervous systems. Systematic examination includes advanced topics in clinical neuropsychology, clinical neurology, psychopharmacology, psychoneuroendocrinology, and the biochemical processes underlying dysfunction, as well as treatment approaches to the various neuropsychological and psychological disorders. (Prerequisite: Permission of Instructor)

PSY 688 3 Credits Spring
Practicum in Community Psychology (2+7)
Practicums provide for supervised experiences and weekly seminars with course instructor. The supervised experience is at an agency that will provide direct and/or participant observation and interactions for the beginning counselor along with immediate feedback concerning the experience. The weekly seminars will cover actual and role-playing situations and skills appropriate to the specific practicum, i.e. alcohol or drug abuse, community, or clinical. (Prerequisite: Permission of Instructor)

PSY 690 12 credits Semester
Internship in Community Psychology (0+40)
Usually one semester. The intership would not occur until after the first year. However, it can be two summers or one-half time over a year or so or full-time for one semester in order to get 600 hours. The internship must be in one setting and adequately supervised. (Prerequisite: Completion of required coursework)

Russian

Russ. 101 5 Credits — **Fall**
Russ. 102 5 Credits — **Spring**
Elementary Russian I and II (5+0) h
Introduction to the language and culture: development of competence and performance in the language through understanding, recognition and use of linguistic structures, increasing emphasis on listening comprehension and speaking, basic vocabulary of approximately 750 words, exploration of the cultural dimension, implicitly through language, and explicitly through texts and audio-visual materials; use of Foreign Language Learning Center.

Russ. 201 4 Credits — **Fall**
Russ. 202 4 Credits — **Spring**
Intermediate Russian I and II (4+0) h
Continuation of Russ. 102. Increasing emphasis on reading ability and cultural materials. Conducted in Russian. (Prerequisite: Russ. 102 or two years of high school Russian.)

Russ. 288 2 Credits — **Alternate Spring**
Individual Study: Reading Russian h
Emphasis on expanding passive vocabulary and recognizing basic grammatical structures; modern Soviet texts. (Prerequisites: Russ. 201, equivalent training or permission of instructor. Recommended to be taken concurrently with Russ. 202. Next offered: 1985-86.)

Russ. 301 3 Credits — **Alternate Fall**
Russ. 303 3 Credits — **Alternate Fall**
Advanced Russian (3+0) h
Discussions and essays on more difficult subjects or texts: translations, stylistic exercises, and special grammatical problems. Conducted in Russian. (Prerequisite: Russ. 202 or instructor's permission. Next offered: Russ. 301, 1985-86; Russ. 303, 1984-85.)

Russ. 387 2 Credits — **Alternate Fall**
Individual Study: Semantics h
Systematic expansion of passive and active vocabulary through analysis of word fields, series of synonyms and antonyms, principles of word formation, derivation, composition, etc. (Prerequisite: Two years of Russian or permission of instructor. Next offered: 1985-86.)

Russ. 432 3 Credits — **Spring**
Studies in Russian Literature and Civilization (3+0) h
Intensive study of authors, literary movements, periods, and/or genres. Analysis of cultural material other than texts. Conducted in Russian. Student may repeat course for credit when topics vary. (Prerequisites: Russ. 301 or 303 or equivalent, and at least sophomore standing, or permission of instructor.)

Russ. 487 2 Credits — **Alternate Fall**
Individual Study: Translation (2+0) h
Expansion of vocabulary and grammatical knowledge, emphasis on understanding precise shades of meaning, stylistic, artistic expression and cultural values in language; literary and non-literary tests. Conducted in Russian. Student may repeat course for credit if materials vary. (Prerequisites: Russ. 301 or 303 or equivalent and at least sophomore standing, or permission of instructor. Next offered: 1984-85.)

Rural Development

R.D. 300 3 Credits — **As Demand Warrants**
Rural Development and Rural Communities (3+0)
A comparative and theoretical approach to the process of change and development, particularly in relation to their effects on rural communities. Cross-national and cross-cultural case studies are extensively utilized. (Prerequisite: junior standing or permission of instructor.)

R.D. 325 3 Credits — **As Demand Warrants**
Community Organization and Development Strategies (3+0)
The relationships among communication, problem-solving and decision-making in institutional and community development frameworks. Particular emphasis will be placed on students gaining insights into the community development organizational strategies that are appropriate for the student's social, economic and cultural environment.

R.D. 350 3 Credits — **As Demand Warrants**
Community Research and Planning Techniques (3+0)
Basic techniques and concepts associated with long range community level research, planning and evaluation; data gathering techniques related to the planning needs of native corporations, rural communities and the rural school districts, and evaluation techniques for assessing the long range impact of on-going programs. Students also will gain practical experience in grant writing.

R.D. 400 3 Credits (Ed 360) — **As Demand Warrants**
Rural Development Internship
Structured experience in an appropriate educational, agency or corporate setting. The student will be required to complete an approved project. Enrollment only by prior arrangement with the instructor.

R.D. 450 3 Credits — **As Demand Warrants**
Managing Community Development Projects and Programs (3+0)
An examination of appropriate management and accountability approaches for small-scale, community-based programs and projects, particularly those found in rural and/or cross-cultural contexts. (Prerequisite: R.D. 325 or permission of instructor.)

R.D. 475 3 Credits — **As Demand Warrants**
Rural Development Senior Project
Under faculty supervision, the student will be required to complete a major theoretical, research and/or applied project which relates the student's applied emphasis area to rural development considerations. (Prerequisite: Senior standing or permission of instructor.)

Social Work

SWK. 103 3 Credits (Soc 103) — **Fall**
Introduction to Social Work (3+0)
Introduction to the profession of social work and the social service delivery system. Examines the historical development of social work with emphasis on the knowledge, values, and skills utilized by the social worker. Designed to help the student test social work as a possible career choice. (Prerequisites: Psy. 101 and Soc. 101)

SWK. 201 3 Credits (Soc 305) — **Spring**
Introduction to Human Services (3+0)
A study of the various social programs and human services which constitute society's organized response to social problems. Federal programs authorized by the Social Security Act and other legislation are presented and various community services are described, including those directed at child welfare, alcohol and drug abuse, mental health, juvenile delinquency, and discrimination. Local human service agencies are discussed as well as regional offices located in the rural Alaskan areas. (Prerequisites: SWK. 103, Soc. 101 or Psy. 101.)

SWK. 306 3 Credits (Soc 306) — **Spring**
Social Welfare: Policies annd Issues (3+0)
Social policies and how they effect the delivery of social services. Factors that have influenced the development of the current social service system and its place in the total social structure. Analysis of the dilemmas which develop in a welfare system attempting to deal with rapid social change. Exploration of alternative approaches to the solution of social problems and possible future developments in the social service system. (Prerequisite: HMSV 201.)

SWK. 320 3 Credits — **Spring**
Rural Social Work (3+0)
Preparation for practice in rural areas where there is a need for more than one delivery system, an understanding of rural customs, and a scarcity of resources. Emphasis will be on preparation for practice nationally with unique features of Alaska incorporated at key points. (Prerequisites: SWK. 103, Soc. 101 or Psy. 101.)

SWK. 342 3 Credits (Soc 342) — **Fall**
Human Behavior in the Social Environment (3+0)
This course presents theoretical frameworks considered useful for organizing knowledge about the understanding of personality development and social behavior of individuals. The course will encompass the study of the life cycle, including the processes that shape the individual differences. (Prerequisites: SWK. 103, HMSV 201 or instructor's consent.)

SWK. 460 3 Credits Fall
Social Work Practice I (3 + 0)
Development of beginning skills in interviewing and helping processes with individuals, families and groups. Application of intervention strategies and techniques made to case materials, primarily in family and child welfare services. Contracting, case management and social brokerage are discussed. (Prerequisites: SWK. 306, social work major, senior standing; must be taken concurrently with SWK. 461.)

SWK. 461 6 Credits Fall
Practicum in Social Work I
Application of knowledge and skills to practice in agency setting as practitioners in problem-solving process, including problem assessment, planning and negotiating contracts, implementation and goal attainment and termination and evaluation. Beginning generic skills are practiced in work with individuals, groups annd families. Students complete 200 hours of direct practice in an approved agency under the supervision of a field instructor. (Prerequisites: SWK. 306, senior standing, social work major; must be taken concurrently with SWK. 460.)

SWK. 463 3 Credits Spring
Social Work Practice II
Further development of student's knowledge of direct practice with clients and development of beginning skills in community work including social planning. Heavy emphasis placed on aspects of rural practice such as utilization of community associations and the informal helping network. (Prerequisites: SWK. 460, SWK 461, senior standing, social work major; must be taken concurrently with SWK. 464.)

SWK. 464 6 Credits Spring
Practicum in Social Work II
Continuation of SWK. 461; further experience of direct practice with client groups, development and use of beginning skills in community work including social planning, indirect or macro-social work methods focus. Emphasis placed on social work methods adapted to rural and cross-cultural settings. Students complete 200 hours of practice in an approved agency under the supervision of a field instructor. (Prerequisites: SWK. 460, SWK. 461, senior standing, social work major; must be taken concurrently with SWK. 463.)

Sociology

Soc. 101 3 Credits Fall and Spring
Introduction to Sociology (3 + 0) s
An introduction to the science of man as a social animal, emphasizing the interactional, structural, and normative aspects of social behavior which give rise to and shape man's language, experiences, perception, meaning and behavior. An attempt is made to construct a cross-cultural framework to be used in understanding and predicting human behavior.

Soc. 102 3 Credits Spring
Social Institutions (3 + 0) s
A continuation of Soc. 101: application of the concepts learned by developing and carrying out short surveys of sociological phenomena. Institutions of society, such as family, political and economic order, are examined, including their operation in the Alaska rural and cross-cultural milieu. (Prerequisite: Soc. 101.)

Soc. 201 3 Credits Fall
Social Problems (3 + 0) s
A study of the major problems facing contemporary society, including analysis of factors giving rise to the problems. Emphasis is given to cross-cultural differences regarding the types and extent of problems that exist in the ethnic subcultures in Alaska.

Soc. 242 3 Credits Spring
The Family: A Cross-Cultural Perspective (3 + 0) s
The study of contemporary patterns of marriage and family relationships in America. Using a developmental approach, the family is followed through the stages of the family life cycle, including mate selection, marriage, early marital interaction and adjustment, parenthood, the middle and later years of marriage, and family dissolution. Emphasis is given to cross-cultural differences. Variations in the family life course are noted among Alaskan native populations.

Soc. 250 3 Credits Fall and Spring
Introductory Statistics for Behavioral Sciences (3 + 0)
(Same as Psy. 250.)
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. (Prerequisite: Soc. 101.)

Soc. 301 3 Credits Spring
Rural Sociology (3 + 0) s
Application of the principles of sociology to the study of rural social systems in the U. S. and abroad. Topics covered include: societal processes, changing values, economic development, demographic change, agrarian reforms, planned change, and rural community networks. Part of the focus will be on the rural communities of Alaska. (Prerequisites: Soc. 101, Soc. 103 or permission of instructor.)

Soc. 304 3 Credits Fall
Personality (3 + 0) s
(Same as Psy. 304)
Psychological and social/cultural determinants of personality formation including appropriate theories in both areas. (Prerequisite: Psy. 101.)

Soc. 307 3 Credits Spring
Demography (3 + 0) s
The study of formal demographic variables such as Fertility, Mortality, and Migration and their interaction with social demographic variables like social class, religion, race, residence, attitudes, and values. The course also focuses on the Alaskan population dynamics.

Soc. 309 3 Credits Alternate Fall
Urban Sociology (3 + 0) s
Origin and development of urban society as an industrial-ecological phenomenon; the trends of migration and metropolitanism with futuristic implications; and the rural-urban dichotomy in the Alaskan content.

Soc. 310 3 Credits Alternate Spring
Sociology of Later Life (3 + 0) s
An analysis of the social status and role of the aging in America, with comparisons with elderly in Alaska as well as those in other societies. (Prerequisite: Soc. 101. Next offered: 1986-87.)

Soc. 330 3 Credits Spring
Social Psychology (3 + 0) s
(Same as Psy. 330)
An analysis of inter-group relationships in terms of process and value orientation, their influences on the personality, and the various aspects of collective behavior on group and person. Of special concern are those aspects of social interaction that have cultural and intercultural variation. (Prerequisites: Soc. 101, Psy. 101.)

Soc. 340 3 Credits Fall
Abnormal and Deviant Behavior (3 + 0)
(Same as Psy. 340.)
Psychological and sociological factors are combined in the study of the causes and consequences of abnormal and deviant behavior, focusing on awareness of the diverse forms and patterns of abnormal and deviant behavior, investigation of causes, consideration of types of intervention or treatment, and application in rural and cross-cultural setting. (Prerequisite: Psy. 101.)

Soc. 345 3 Credits Fall
Sociology of Education (3 + 0)
(Same as Ed. 345)
Examination of the ways in which social, political, and economic forces influence what happens in schools with focus on how the oranization of schools affects what teachers can do in the classroom, how peer groups affect student learning, and how national political and economic concerns determine what becomes an educational issue. (Prerequisites: Soc. 101 and junior standing.)

Soc. 363 3 Credits Fall
Social Stratification (3 + 0) s
The study of the differential distribution of social power, privilege, and life chances in class and caste as the basis for social organization. Emphasis on occupational, educational, and other correlates which determine social structure. Also includes a comparative study of class and caste in India and the United States. (Prerequisites: Soc. 101, 102.)

Soc. 370 3 Credits Alternate Fall
Drugs and Drug Dependence (3+0) s
(Same as Psy. 370)
A multidisciplinary approach to the study of drugs and drug abuse emphasizing acute and chronic alcoholism, commonly abused drugs, law enforcement and legal aspects of drug abuse, medical uses of drugs, physiological aspects of drug abuse, psychological and sociological causes and manifestations of drug abuse, recommended drug education alternatives and plans, and the treatment and rehabilitation of acute and chronic drug users. (Prerequisite: Psy. 101 or Soc. 101 or permission of instructor. Next offered: 1985-86.)

Soc. 402 3 Credits Spring
Theories of Sociology (3+0) s
Major sociological theories and theorists of Western civilization. Review of important contributions and approaches of various "national schools" with emphasis on current American and European trends. (Prerequisite: Permission of instructor.)

Soc. 405 3 Credits Alternate Spring
Social Change (3+0) s
Philosophy of change and its affiliation to socio-cultural change in terms of history, technology, axiology, and social movement. (Prerequisites: Soc. 101, 102 or permission of instructor. Next offered: 1986-87.)

Soc. 406 3 Credits Alternate Spring
Environmental Sociology (3+0) s
The study of the interaction between society and physical environment including the ecological complex — population, organization, environment, and technology — which is used as the analytical framework to study the societal-environmental interaction. (Prerequisite: Soc. 101. Next offered: 1985-86.)

Soc. 407 3 Credits Alternate Spring
Formal Organization (3+0) s
Theoretical and analytical approaches to the study of contemporary complex formal organizations, including their coordination, status and role interrelationships, and their diverse publics. Formal organizations unique to Alaska's multicultural population will be considered. (Prerequisite: Soc. 101. Next offered: 1985-86.)

Soc. 408 3 Credits Alternate Spring
American Minority Groups (3+0) s
An examination of the status of minority groups annd intergroup relations in America, including changes in sociological, economic and political status. Theories and concepts of minority role behavior and intergroup relatives are applied to American and Alaskan racial and ethnic groups. (Prerequisite: Soc. 101. Next offered: 1985-86.)

Soc. 473 3 Credits Fall
Social Science Research Methods (3+0) s
(Same as Psy. 473.)
Techniques of social research: sampling, questionnaire construction, interviewing and data analysis in surveys; field and laboratory experiments, and attitude scaling. (Prerequisite: Psy. 250 or Soc. 250.)

SOC 638 3 Credits Fall
Social Policy and Social Change (3+0)
Analysis of social policy issues related to community health, empowerment, and change will lead to an understanding of how spontaneous and planned social change takes place. Particular attention will focus on issues in the development of new settings in cross-cultural and rural contexts. (Prerequisite: Permission of Instructor)

SOC 645 3 Credits Spring
Prevention Theories and Strategies (3+0)
Environmental and psychosocial approaches in the prevention of mental and emotional disturbances. Theories that focus on situational stress are examined, as well as methods and coping situations that can be used to reduce this stress. The unique environmental problems of rural areas and problems in cases of cultural conflict are particularly noted. (Prerequisite: Permission of Instructor)

SOC 646 3 Credits Fall
Consultation (3+3)
(Same as PSY 646)
Experiences and training in consultation skills as a professional who can be looked to for expert help in specific areas related to their preparation in Community Psychology and related disciplines. Consultation as problem solving, as indirect service and as a colleague relationship in behavior dynamics, personal and interpersonal relationships, communication skills and community network support services is emphasized. (Prerequisite: Permission of Instructor)

Spanish

(For studying in Mexico, see p. 63)

Span. 101 5 Credits Fall
Span. 102 5 Credits Spring
Elementary Spanish I and II (5+0) h
Introduction to the language and culture: development of competence and performance in the language through understanding, recognition and use of linguistic structures, increasing emphasis on listening comprehension and speaking, basic vocabulary of approximately 1000 words, exploration of the cultural dimension, implicitly through language and explicitly through texts and audio-visual materials; use of Foreign Language Learning Center.

Span. 201 3 Credits Fall
Span. 202 3 Credits Spring
Intermediate Spanish I and II (3+0) h
Continuation of Span. 102. Increasing emphasis on reading ability and culture material. Conducted in Spanish. (Prerequisite: Span. 102 or equivalent.)

Span. 288 2 Credits Spring
Individual Study: Reading Spanish h
Emphasis on rapid expansion of passive vocabulary and immediate recognition of frequent idiomatic expressions and grammatical structures, development of true reading skill, and modern literary and/or non-literary texts. (Prerequisites: Span. 201, equivalent training or permission of instructor. Recommended to be taken concurrently with Span. 202.)

Span. 301 3 Credits Alternate Fall
Span. 303 3 Credits Alternate Fall
Advanced Spanish (3+0) h
Discussions and essays on more difficult subjects or texts, translations, stylistic exercises, and special gramatical problems. Conducted in Spanish. (Prerequisite: Span. 202 or equivalent. Span. 301 next offered: 1985-86; Span. 303: 1985-86.)

Span. 387 2 Credits Alternate Fall
Individual Study: Semantics h
Systematic expansion of passive and active vocabulary through analysis of word fields, series of synonyms and antonyms, principles of word formation, derivation, composition, etc. Conducted in Spanish. (Prerequisite: Span. 202 or permission of instructor. Next offered: 1985-86.)

Span. 432 3 Credits Spring
Studies in Hispanic Literature and Culture (3+0) h
Intensive study of authors, literary movements, periods, and/or genres. Analysis of cultural material other than texts. Conducted in Spanish. Student may repeat course for credit when topics vary. (Prerequisite: Span. 301 or 303 or equivalent and at least sophomore standing, or permission of instructor.)

Span. 487 2 Credits Alternate Fall
Individual Study: Translation of Texts
Expansion of vocabulary and grammatical knowledge; emphasis on understanding precise shades of meaning, stylistics, artistic expression and cultural values in language, and literary and non-literary texts. Student may repeat course for credit if materials vary. Conducted in Spanish. (Prerequisite: Span. 301 or 303 or equivalent and at least sophomore standing, or permission of instructor. Next offered: 1986-87.)

Span. 488 3 Credits As Demand Warrants
Individual Study: Senior Project h
Designed to permit the student to demonstrate ability to work with the language and the culture through the analysis and presentation, in the language, of a problem chosen by the student in consultation with the department. The student must apply for senior project and submit a project outline by the end of the 6th week of the semester preceding the semester of graduation. Offered normally in the semester preceding the student's graduation. Conducted in Spanish. (Prerequisite: At least 10 credits in upper division Spanish or permission of instructor.)

Space Physics and Atmospheric Sciences

SPAS 103 3 or 4 Credits Spring
Introduction to Space Science (3+0 or 3+3) n
An exploration in non-mathematical terms of the discoveries of the space age for the general student. Topics include solar-terrestrial relations, the earth's upper atmosphere and magnetosphere (including the aurora), stratosphere, troposphere, and space communications, with emphasis on fundamental physical processes. Laboratory provides participation in a variety of space science activities unique to the Fairbanks campus.

SPAS 465 3 Credits As Demand Warrants
Meteorology (3+0) n
The basic physics and thermodynamics of atmospheric behavior. Topics include composition and thermodynamics of the atmosphere, clouds and storm systems, the global energy balance, atmospheric dynamics, and the general circulation of the atmosphere. (Prerequisite: Phys. 104 or 212, Math. 202.)

SPAS 625 3 Credits As Demand Warrants
Human Impacts on the Atmosphere (3+0)
The effects of anthropogenic additions of energy, molecules and particles to the troposphere and stratosphere. Topics will include the history of air pollution, modern urban heat islands and air pollution problems, arctic haze, acid precipitation, perturbations to the ozone layer, the CO_2 greenhouse warming, and the suggested "nuclear winter" scenario. (Prerequisites: Graduate standing in SPAS, geosciences, or environmental engineering, or permission of instructor.)

SPAS 626 3 Credits Alternate Fall
Fundamentals of Plasma Physics (3+0)
Single charge particle motion in the electromagnetic fields, plasma kinetic theory, Vlasov equations for collisionless plasmas, magnetohydrodynamic equations, linear plasma waves and instabilities, nonlinear plasma waves and instabilities. (Prerequisite: Graduate standing in SPAS. Next offered: 1985-86)

SPAS 627 3 Credits Alternate Spring
Advanced Plasma Physics (3+0)
Vlasov description of small amlitude waves in magetized plasmas, advanced particle orbit theory, fluctuation and incoherent scattering theory, plasma discontinuities and collisionless shocks, weak turbulent theory, statistical theory of turbulence. (Prerequisite: Graduate standing in SPAS. Next offered: 1985-86.)

SPAS 628 3 Credits Alternate Fall
Digital Time Series Analysis (3+0)
The use of methods of time series analysis, including correlation, convolution, filtering, and multivariate techniques. Material is of general application to disciplines that obtain multiparameter date suites as part of their research, such as seismology, oceanography, meteorology, geomagnetism, and space physics. Lectures will develop basic techniques and guide the student in designing working algorithms. The student will apply algorithms to various data suites from geophysics, using the Geophysical Institute's VAX 11/780 computer. (Prerequisites: Math 401 and 402, familiarity with FORTRAN or consent of instructor. Next offered: 1985-86.)

SPAS 629 3 Credits Alternate Fall
Methods of Numerical Simulation in Fluids and Plasma (3+0)
(Same as OCN 629)
The fundamentals of computer simulation including time and spatial differencing and stability theory applied to partial differential equations describing convective and diffusive transport in fluids. The second part of the course will be separated into two tracks: one specializing in ocean and atmospheric dynamics and the other in the plasma state of matter. (Prerequisites: Math. 310, 421, 422 or equivalent; baccalaureate degree in physics, engineering or mathematics or equivalent; for plasma physics track: baccalaureate degree in physics including Phys. 311, 312, 331, 332 or equivalent; experience with FORTRAN.)

SPAS 636 3 Credits Alternate Fall
Physics of the Lower Atmosphere (3+0)
Small-scale physical and chemical processes in the lower atmosphere, including micrometeorology, radiative transfer and cloud physics. Subjects to be covered include the transfer of solar and thermal radiation through the atmosphere, the radiation budget at the surface of the earth, the resulting energy, momentum, and mass fluxes near the ground, water vapor and its phase changes, and the nucleation and growth of cloud droplets and precipitation particles. (Prerequisite: Graduate standing in geosciences or permission of instructor. Next offered: 1986-87.)

SPAS 640 3 Credits Alternate Spring
Auroral Physics (3+0)
The physical and chemical processes that underlie the formation of the aurora. The interaction of energetic particles with the atmosphere in producing various aurorally associated phenomena, optical emissions, ionization, x-rays, and chemical-ionic changes. Effects of aurora on the thermoshere, mesosphere, and stratosphere. Effects of electric fields. The auroral energy budget. (Prerequisite: Graduate standing in geosciences or permission of instructor. Next offered: 1986-87.)

SPAS 645 3 Credits Alternate Fall
Fundamentals of Geophysical Fluid Dynamics (3+0)
An introduction to the mechanics of fluid systems, the fundamental processes and Navier-Stokes' equations in rotating and stratified fluids, boundary layer phenomena, turbulent flows and mixing, wave motions and applications. (Prerequisite: Graduate standing in SPAS. Next offered: 1986-87.)

SPAS 646 3 Credits Alternate Spring
Dynamics of the Atmosphere and Ocean (3+0)
The response of the atmosphere and ocean to mechnical and thermal forcing, mean circulation and thermal structure, the governing fluid equations and appropriate boundary conditions. Other topics include wave motions, cyclogenesis, frontogenesis, and heat, momentum and energy transport. (Prererequisite: Graduate standing in SPAS. Next offered 1986-87.)

SPAS 650 3 Credits Alternate Fall
Aeronomy (3+0)
The physical and chemical processes that govern the response of planetary atmospheres to solar radiation, surface phenomena. Composition of the neutral and ionized gases. Chemical and ionic reactions in the thermosphere, mesophere, and stratosphere. Dynamical processes and upper air winds. The airglow. Electrodynamic processes and ionospheric currents. (Prerequisite: Graduate standing in SPAS or permission of instructor. Next offered: 1986-87.)

SPAS 656 3 Credits Alternate Spring
Atmospheric Circulation, Weather, and Climate (3+0)
The circulation of the atmosphere and the weather and climate produced by that circulation. The general circulation of the atmosphere, weather systems, air-sea and air-snow interactions, circulation types and climatic anomalies, and climatic change. (Prerequisite: Graduate standing in geosciences or permission of instructor. Next offered: 1985-86.)

SPAS 672 3 Credits Alternate Fall
Magnetospheric Physics (3+0)
Mass, momentum and energy transfer in the solar wind-magnetosphere - ionsphere interaction, electrodynamics of the magnetosphere - ionosphere coupling, auroral acceleration process, auroral kilometric radiation, geomagnetic pulsations, magnetospheric substorm phenomena and theories, generation mechanism of field-aligned currents, structures and instabilities at the magnetopause. (Prerequisite: Graduate standing in SPAS. Next offered: 1985-86.)

SPAS 673 3 Credits Alternate Spring
Space Physics (3+0)
Sun spot formation, solar flare theories, solar wind, planetary bowshocks and interplanetary shocks, cosmic rays, pulsars, magnetic field reconnection concepts and theories, dynamo theories. (Prerequisite: Graduate standing in SPAS. Next offered: 1985-86.)

Speech Communication

Sp.C. 121 3 Credits Fall and Spring
Fundamentals of Oral Communication: Interpersonal Emphasis (3+0)
An introduction to the communication process. Focuses on the core concepts of listening, perception, verbal and non-verbal communication, and organizing materials. Emphasizes increased understanding of and effective performance in TWO-PERSON COMMUNICATION SITUATIONS.

Sp.C. 131 3 Credits Fall and Spring
Fundamentals of Oral Communication: Small Group Emphasis (3+0)
An introduction to the communication process. Focuses on the core concepts of listening, perception, verbal and non-verbal communication, and organizing material. Emphasizes increased understanding of and effective performance in SMALL GROUP COMMUNICATION SITUATIONS.

Sp.C. 141 3 Credits Fall and Spring
Fundamentals of Oral Communication: Public Speaking Emphasis (3+0)
An introduction to the communication process. Focuses on the core concepts of listening, perception, verbal and non-verbal communication, and organizing material. Emphasizes increased understanding of and effective performance in PUBLIC SPEAKING SITUATIONS.

Sp.C. 211 3 Credits Fall
Voice and Diction (2+2)
Development of fluency and clearness in the voice, study and practice to improve speech and eliminate faults of articulation and pronunciation, phrasing, inflection, and emphasis, including individual analysis and tape recording. (Prerequisite: Any 100 level oral communication course or permission of instructor.)

Sp.C. 221 3 Credits Alternate Fall
Interpersonal Communication (3+0) h
The study of humanistic approaches to interpersonal communication. Emphasis is on dialogic/transactive communication within two person situations. Indepth exploration of theoretical materials related to many types of relational interchanges. (Prerequisite: Any 100 level oral communication course or permission of instructor.)

Sp.C. 231 3 Credits Alternate Fall
Business and Professional Speaking (3+0) h
A pre-professional course designed to help business and professional students improve their oral communication skills, focusing on such topics as interviewing, meetings and conferences, manuscript speaking, selling, technical speaking, telephone techniques, and situational speeches. (Prerequisite: Any 100 level oral communication course or permission of instructor.)

Sp.C. 251 3 Credits Alternate Years
Argumentation and Debate (3+0) h
Principles and practices in contemporary debate. Review and analysis of relevant argumentation principles as applied to a debate situation. Practice in preparation, defense, and refutation of cases developed in reference to a given debate resolution. (Prerequisite: Any 100 level oral communication course or permission of instructor. Next offered: 1986-87.)

Sp.C. 261 3 Credits Alternate Years
Oral Interpretation (3+0) h
Interpretive reading of a variety of literary forms. Focuses on the development of (1) intellectual and emotional responsiveness to literature for increased understanding and appreciation, and (2) expressional skills of voice and body for effective oral interpretation of literature. (Prerequisites: Any 100 level oral communication course, Thr. 221, or permission of instructor. Next offered: Fall 1985.)

Sp.C. 320 3 Credits Alternate Years
Communication and Language (3+0) h
An examination of the role of language and meaning in human communication. (Prerequisite: Any lower division speech communication course or permission of instructor. Next offered: 1985-86.)

Sp.C. 321 3 Credits Alternate Years
Nonverbal Communication (3+0) s
An examination of the role of non-lexical behavior in human communication. Includes consideration of the roles of space, physical environment, physical appearance and dress, kinesics, facial expression, and non-lexical vocal behavior. (Prerequisite: Any lower division Speech Communication course or permission of instructor. Next offered: Spring 1986.)

Sp.C. 330 3 Credits Alternate Years
Intercultural Communication (3+0) s
An examination of both the nature and the sources of problems in communication that may arise when persons with different cultural backgrounds interact. Topics include both culture and communication as systems of human beahvior, as well as the verbal and non-verbal aspects of intercultural interaction. Special emphasis on problems in intercultural communication in Alaska. (Prerequisite: Any lower division Speech Communication course or permission of instructor. Next offered: 1986-87.)

Sp.C. 335 3 Credits Alternate Years
Organizational Communication (3+0) s
An exploration of the scope and nature of communication networks within and between organization, concentrating on message flow, interaction patterns, and environmental-structural interactions in organizational settings. (Prerequisite: Completion of one lower division Speech Communication course or permission of the instructor. Next offered: 1986-87.)

Sp.C. 341 3 Credits Alternate Years
Persuasion (3+0) s
An examination of communication situations which involve attempts to modify the beliefs, attitudes, values, intentions, or behaviors of another individual or group of individuals. Explores the process, methods, and ethics of attempts to affect change via persuasive communication. (Prerequisite: Any lower division Speech Communication course or permission of the instructor. Next offered: Fall 1985.)

Sp.C. 342 3 Credits Alternate Years
Advanced Public Speaking (3+0) h
Advanced opportunities to study and critique methods of speech preparation and delivery. Performance and criticism of original speeches to develop understanding of sophisticated techniques of public discourse in a variety of speech situations including hostile and opinionated audiences. (Prerequisite: Any lower division Speech Communication course or permission of the instructor. Next offered: 1986-87.)

Sp.C. 425 3 Credits Alternate Years
Communication Theory (3+0) s
Study of theories of human communication, as well as of the nature of inquiry into human communication phenomena. Issues covered include the nature of communication as a discipline, critical and scientific inquiry, and major paradigms or perspectives within which communication theories are created. (Prerequisite: Any 300 level Speech Communication course or permission of the instructor. Next offered: 1986-87.)

Sp.C. 443 3 Credits Alternate Years
Rhetorical Theory (3+0) h
Critical analysis of Plato, Aristotle and Sophists on rhetoric, tracing the development of rhetorical theory from inception in 500 B.C. to current practices. Significant contributions by important scholars of rhetoric will be studied to determine how various theories developed through the centuries. (Prerequisite: Any 300 level oral communication course or permission of the instructor. Next offered: Fall 1985.)

Sp.C. 475 3 Credits Alternate Years
Speech Communication Methods for the Classroom (3+0)
Methods for teaching speech communication on the K-12 level with a discussion of co-curricular responsibilities often associated with individuals from various disciplines whose position may involve oral communication instruction. (Prerequisite: Any 300 level Speech Communication course or permission of instructor. Next offered: 1986-87.)

Sp.C. 482 3 Credits **Alternate Years**
Seminar in Speech Communication (3+0) h
Current trends and theory in key-areas of the discipline of Speech Communication are examined. Students will concentrate their research in their speciality area while examining selected topics in all the areas. (Prerequisite: Any 300 level Speech Communication course or permission of instructor. Next offered: Spring 1986.)

Theater

Thr. 101, 201
Thr. 301, 401 1-3 Credits **Fall and Spring**
Theater Practicum (0+Var.) h
Participation in Drama Workshop or lab production as performer or technical staff member. Graded pass/fail only. (Credit in this course may not be applied to a major program in theater.)

Thr. 161 3 Credits **Fall**
Introduction to Tuma Theatre (3+0) h
(Same as ANS 161)
Introduction to the development and performance of original and traditional theatrical works derived from various Alaska Native cultural heritages and experiences. This course is a prerequisite for ANS/THR 361, Advanced Tuma Theatre and for membership in the Tuma Theatre touring company.

Thr. 211 3 Credits **Fall**
Introduction to the Theater (3+0) h
Understanding and appreciation of both the distinctive and collaborative contributions of playwright, actor, director and designer to the total work of dramatic art. Study of plays and theater forms from the major periods of theater.

Thr. 221 3 Credits **Fall**
Acting I (1+4) h
Principles of acting developed through pantomime, improvisation, and sense-memory.

Thr. 225 3 Credits **Alternate Spring**
Movement for the Actor (1+4) h
Principles of stage movement, body awareness, and control as explored through analysis, exercise, study of historical dance and scene work. (Next offered: 1985-86.)

Thr. 241 3 Credits **Fall**
Basic Stagecraft (2+2) h
Materials of scene construction and painting and their use.

Thr. 321 3 Credits **Alternate Spring**
Acting II (1+4) h
Building a character; role study and performance of small scenes. (Prerequisite: Thr. 221, or admission by arrangement. Next offered: 1984-85.)

Thr. 325 3 Credits **Alternate Fall**
Theater Speech (2+2) h
Vocal techniques for actors. Standard stage diction and foreign dialects. (Prerequisite: Thr. 221 or permission of instructor. Next offered: 1985-86.)

Thr. 331 3 Credits **Alternate Fall**
Directing (1+4) h
Direction of short plays for drama lab productions. (Prerequisite: Thr. 221 or admission by arrangement. Next offered: 1984-85.)

Thr. 341 3 Credits **Alternate Years**
Intermediate Stagecraft (2+2) h
An examination of the less common scenic materials with methods and techniques for their use. Particular attention will be given to the use of dye in painting backgrounds, projection slides, vacuum formed plastics, molded polyurethane foam, etc. (Students will spend approximately $40 for materials.) (Prerequisite: Thr. 241 or permission of instructor. Next offered: 1986-87.)

Thr. 343 3 Credits **Alternate Fall**
Scene Design (3+0) h
Principles and techniques of theatrical scene design. The student will design projects directed at solving particular scenic problems or working in a specific scenic style with specific physical limitations. (Prerequisite: Thr. 241 or permission of the instructor. Students will spend approximately $40 for materials. Next offered: 1986-87.)

Thr. 347 3 Credits **Alternate Spring**
Lighting Design (3+0) h
Principles and techniques of theatrical lighting design. The student will conduct practical experiments and design projects applying the experience gained from the experiments. (Prerequisite: Thr. 343 or permission of the instructor. May be taken concurrently with Thr. 343. Students will spend approximately $40 for materials. Next offered: 1986-87.)

Thr. 351 3 Credits **Spring**
Makeup for Theater (1+4) h
Theatrical makeup for actors, teachers, directors, and other theater workers; makeup materials and use, straight and character makeup, illusory and plastic relief, national types, and influence of lighting. (Students will spend approximately $85 for materials.) (Prerequisite: Any lower division theater course or permission of the instructor.)

Thr. 354 3 Credits **Fall**
Costume Construction and Design (3+0) h
An examination of the processes of research, design, and construction of period and modern clothing for the stage. The student will research and design projects representative of specific periods of dress, as well as be given practical experience in the areas of pattern drafting, theatrical construction methods, and drawing and rendering techniques. (Prerequisite: Thr. 211 or permission of the instructor.)

Thr. 355 3 Credits **Alternate Spring**
History of Stage Costume (3+0) h
Stage costume and contemporary dress of the major theatrical periods. Emphasis will be placed on the process of selection of costumes for representative plays of each period. (Prerequisite: Thr. 211 or permission of instructor. The student is expected to have basic knowledge of theater practice and the interpretation of dramatic literature. Next offered: 1986-87.)

Thr. 361 3 Credits **Fall**
Advanced Tuma Theatre (3+0) h
(Same as ANS 361)
Continuation of ANS/Thr. 161 with emphasis on performance of previously prepared materials. Rehearsals during the first half of the semester will be followed by local area performances. Upon successful completion of the course, students will be eligible for the Tuma Theatre Company's spring and summer tours (see Thr. 101-401). (Prerequisites: ANS/Thr. 161 and one of the folowing: Thr. 221, Thr. 241, Thr. 343, Thr. 347 or permission of instructor.)

Thr. 411 3 Credits **Alternate Years**
Theater History I (3+0) h
An intensive examination of theatrical form and practice from its origins in storytelling and ritual through the French Neo-classic Theater. (Prerequisites: Junior standing and Thr. 211 or permission of instructor. Next offered: 1986-87.)

Thr. 412 3 Credits **Alternate Years**
Theater History II (3+0) h
An intensive examination of theatrical form and practice from the English Restoration through the present. (Prerequisites: Junior standing and Thr. 211 or permission of instructor. Next offered: 1985-86.)

Thr. 421 3 Credits **Alternate Spring**
Period Styles of Acting (2+2) h
The acting techniques required for the performance of period plays ranging from Greek Drama through Absurdist Theater. (Prerequisites: Acting I plus Acting II or permission of instructor. Next offered: 1985-86.)

Thr. 435 3 Credits **As Demand Warrants**
Directing (3+0) h
Directorial analysis of a major dramatic work for public presentation. (Prerequisite: Senior majors with 3.00 G.P.A. in Theater.)

Wildlife and Fisheries

W.F. 301 3 Credits Spring
Principles of Animal Population Dynamics and Management (2+2)
History of wildlife and fisheries laws and regulations, role and wildlife management philosophies of state and federal wildlife management agencies, and population management of single species of fish and wildlife. Population growth potential, determination of survival, birth and death rates, life table construction, and determining levels of exploitation based on age and sex structure, previous harvest rates, habitat alteration, and predator manipulation. (Prerequisites: Biol. 271 and A.L.R. 101.)

W.F. 302 2 Credits Alternate Spring
Fish and Wildlife Ecology and Management (1+3)
History of attitudes, laws, and regulations affecting fish and wildlife, the role and management philosophies of state and federal wildlife and fisheries agencies, the components of breeding potential of populations, and the factors affecting populations (food, cover, water, diseases, predators and other.) Identification, life history and management of Alaskan birds, mammals, and commercial and sport caught fish and shellfish species. (Prerequisites: A.L.R. 101 or Biol. 104, 105, or 106 or permission of instructor. Next offered: 1985-86.)

W.F. 333 2 Credits Fall
Information Retrieval in Biology and Resource Management (1+2)
Standard and modern approaches to utilization of biological literature and introduction to information retrieval problems and techniques. Thorough acquaintance developed with periodical and other literature in student's special interest field.

W.F. 382 2 Credits As Demand Warrants
Biology of the Freshwater Fish of Alaska (2+0)
Life histories of the freshwater fish of Alaska with emphasis on species sought by sport, commercial, and subsistence fishermen. Information on reproduction, age, growth, migration, food, inter and intra species relationships, stock sizes and habitat requirements will be presented. (Prerequisite: Biol. 106 or permission of instructor.)

W.F. 401 3 Credits Fall
Wildlife Management Techniques (2+3)
Methods of collecting, analyzing and disseminating data, either for a research project or for implementing wildlife management plans. A brief discussion of the usefulness of a technique will precede its description or application. Techniques for determining sex, age, food habits, movements, distributions, reproductive history, physical condition, population size, and habitat status, for collecting, organizing and analyzing field observations, and for public information and education will be considered. (Prerequisites: W.F. 301 and A.S. 301.)

W.F. 402 3 Credits Spring
Advanced Wildlife Biology and Management (2+3)
Extends the single-species emphasis of W.F. 301 to more complex management situations dealing with two or more sympatric species. Examines the management of predator-prey groups and groups of competing or otherwise interrelated species. Provides extensive discussion of habitat and ecosystem management in situations ranging from small sanctuaries to large federal areas or areas of regional scale largely in private ownership. (Prerequisites: W.F. 301, A.S. 301. Biol. 472 desirable.)

W.F. 411 Credits Arr. As Demand Warrants
Fisheries Field Trip
A trip to acquaint students with some of the principal fisheries of the state and problems involved in their management. (Prerequisite: major in fisheries biology or admission by arrangement.)

W.F. 417 2 Credits Alternate Spring
Wildlife Management — Forest and Tundra (2+0)
Description of tundra and northern forest ecosystems with emphasis on interactions of climate, vegetation, and wildlife populations. Effect on wildlife populations of land use practices including: development of petroleum resources, creation of transportation networks, mining, timber cutting, damming, and prevention of fire. Major emphasis on research and management of wildlife populations under private, state, and federal administration. Field trip to coastal southcentral Alaska. (Prerequisites: Biol. 425 and Biol. 426 or permission of the instructor. Next offered: 1986-87.)

W.F. 419 2 Credits Alternate Fall
Wildlife Management — Wetlands (2+0)
Description, administration, and management of wildlife populations in arctic coastal habitats, subarctic tundra and forest habitats, north temperate coastal habitat, prairie potholes, artificial ponds, and reservoirs; swamps, and both freshwater and salt ponds, marshes, and lakes. Habitat management techniques including: pothole blasting, water level manipulation, diking, ditching, planting, fencing, and burning. Population management of furbearers, of waterfowl on species and flyway basis, of shorebirds, and of marine birds. Field trips to Interior Alaska, and one to coastal southcentral Alaska. (Prerequisite: Biol. 426 or permission of the instructor. Next offered: 1985-86.)

W.F. 423 3 Credits Fall
Limnology (2+3)
Physical, chemical, and biological characteristics of fresh water, emphasizing ecological aspects important to fish and other organisms. (Prerequisites: Chem. 106 and Biol. 271, or permission of the instructor.)

W.F. 424 2 Credits Alternate Spring
Aquatic Entomology (1+3)
The ecology, taxonomy, anatomy, physiology, and evolution of aquatic insects. Laboratories will emphasize identification and field/laboratory techniques. (Prerequisites: Biol. 105-106, Biol. 271 and W.F. 423 recommended or permission of instructor. Next offered: 1985-86.)

W.F. 425 3 Credits Alternate Spring
Ecology of Streams and Rivers (2+3) n
Natural history of organisms and biological processes in rivers and streams. Topics will include primary production, distribution and community structure of benthic invertebrates, system energetics, phenology, biogeography, habitat and feeding biology of fishes. Laboratories will emphasize analyses of actual data and samples. (Prerequisites: Biol. 271 (W.F. 423 recommended) or permission of instructor. Next offered: 1986-87.)

W.F. 429 3 Credits Fall
Introduction to Fisheries Science (2+3)
The general biology of fishes in relation to their management. Methods of collecting, analyzing, and interpreting field and laboratory data. (Prerequisites: Biol. 271, 423 and A.S. 301.)

W.F. 430 3 Credits Spring
Fisheries Management (3+0)
The principles, concepts and techniques of fisheries management are reviewed in terms of their biological, economic, social, and political aspects. Topics covered are: stocking and introductions, habitat manipulation, sustainable yield, regulations, management organizations, and their responsibilities. To clarify concepts and practices, examples of several fisheries are used. (Prerequisites: Biol. 271 and 423.)

W.F. 435 3 Credits Alternate Fall
Water Pollution Biology (3+0)
Effects of man-caused environmental stresses on the composition and dynamics of aquatic communities. Changes in diversity and matter and energy transfer. Biological indices. Water quality, standards, and use classifications. (Prerequisites: Biol. 271, W.F. 423 or permission of the instructor. Next offered: 1985-86.)

W.F. 436 3 Credits Alternate Spring
Introduction to Aquaculture (3+0)
An overview of the rapidly developing field of aquaculture including salmon, trout, and catfish hatcheries, and oyster and other shellfish farming. This will include the theory as well as some practice, and discussions of biological and economic problems. (Prerequisite: W.F. 429. Next offered: 1985-86.)

W.F. 603 2 Credits **Spring**
Problems in Wildlife Management (2+0)
Graduate students, through literature searches and interviews with knowledgeable individuals in resource agencies and private groups, will obtain information, by design from the perspective of a specific interest group, on the various facets of several current Alaskan wildlife management controversies. That information will be presented orally to the class and serve as the basis for class discussion. When the information for all interest groups has been presented, specific courses of action leading to resolution of the problems will be presented and critically examined. (Prerequisites: Equivalent of W.F. 301 and 402.)

W.F. 611 Credits Arr. **As Demand Warrants**
W.F. 612 Credits Arr.
Wildlife Field Trip
Trips to wildlife areas to acquaint students with principal animals of the state and problems involved in their management. (Admission by arrangement.)

W.F. 614 2 Credits **Alternate Spring**
Grazing Ecology (2+0)
(Same as Biol. 614)
A study of plant-animal interactions, emphasizing the grazing process, including mechanisms of feeding, feeding behavior, habitat and plant selection, and physiological influences on feeding. Other topics include the evolution and development of grazing systems, including plant and community level responses, anti-herbivore defenses of plants, and the role of grazing in ecosystem function; management and other human influences on grazing systems, including habitat alternation and loss, domestication, pollutants, and management alternatives. (Prerequisite: graduate standing or approval of instructor. Next offered: 1986-87.)

W.F. 621 3 Credits **Alternate Spring**
Vertebrate Population Dynamics (2+3)
Assessing, describing, and interpreting the characteristics and dynamics of wild populations. Estimates of survival, mortality, and recruitment rates, and of population size, and assessment of population trends and welfare using data from sources such as hunter-kill samples, composition counts, marking and recapturing, predation, and various types of surveys. Students will proceed from simplified artificial data sets to complex real ones. Both analytic and simulation techniques will be used. (Prerequisites: Admission by arrangement: minimal preparation, equivalent to Biol. 271, Math. 200 and A.S. 301. Next offered: 1986-87.)

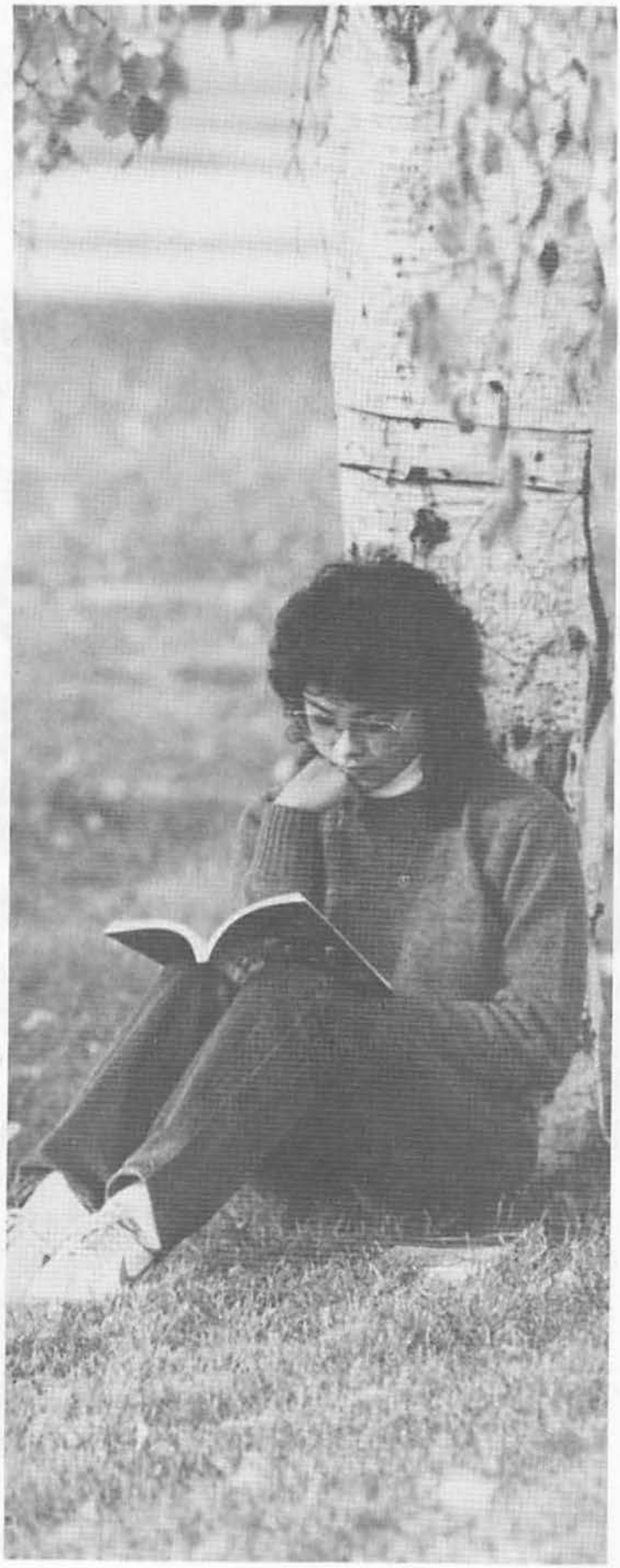
W.F. 624 2 Credits **As Demand Warrants**
Problems in Fisheries Management
Selected readings and discussions relating to major fisheries of the world, their problems, and the methods of attack on these problems. (Admission by arrangement.)

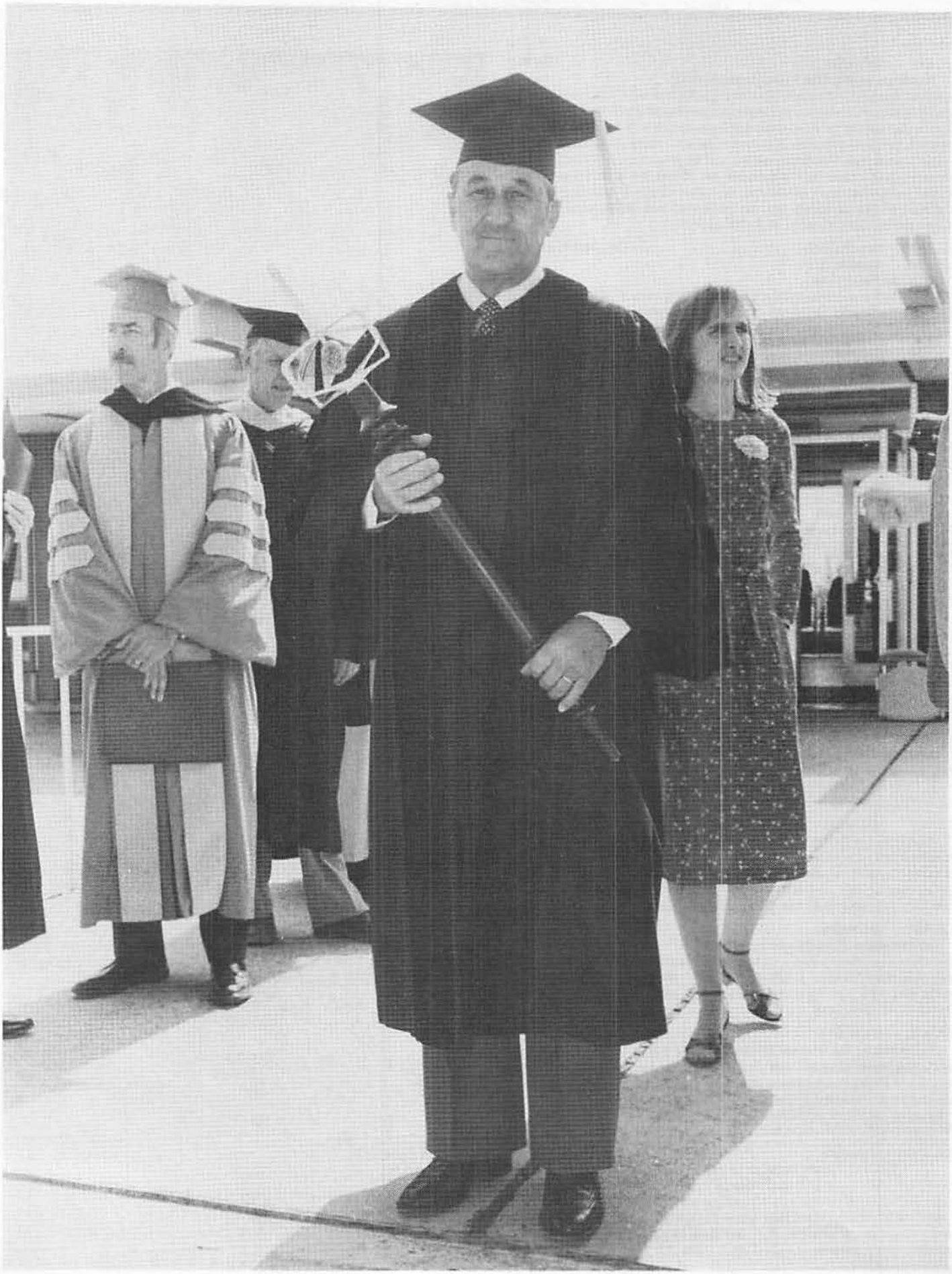
W.F. 625 3 Credits **Alternate Fall**
Fish Ecology (2+3)
The dynamics of aquatic systems, emphasizing community structure, energy flow, trophic relationships, and secondary and tertiary production. Applications to fish and invertebrate fisheries management. (Prerequisites: W.F. 423, and W.F. 429. Next offered: 1985-86.)

W.F. 627 3 Credits **As Demand Warrants**
Invertebrate Fisheries Biology (2+3)
The taxonomy, structure, physiology, and life histories of some commercially important marine shellfishes. Larval development, behavior, reproductive, and feeding biology. Interrelationships of marine animals. (Prerequisite: Biol. 305.)

W.F. 629 2 Credits **Alternate Fall**
Sampling in the Marine Environment (1+3)
An evaluation of classical and current methods for sampling some biological and biologically related parameters (physical, chemical, geological) or marine systems. Demonstration and use of field and laboratory techniques. Problems in calibration and interpretation of data. (Prerequisite: permission of the instructor. Next offered: 1986-87.)

W.F. 630 3 Credits **Alternate Fall**
Quantitative Fishery Science (3+0)
Quantitative analysis and modeling of exploited fish populations. Emphasis is placed on estimates of abundance, recruitment, growth, mortality, and yield. Method and theory are presented in relation to management needs. (Prerequisites: A.S. 301 and W.F. 429 or equivalents or permission of instructor. Next offered: 1986-87.)





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John L. Burdick, Professor of Civil Engineering, Emeritus. Rensselaer Polytechnic Institute '47, B.S.C.E.; Massachusetts Institute of Technology '48, S.M.; P.E.; L.S. (1960-1983)

Axel R. Carlson, Professor of Extension, Emeritus. Michigan State University '53, B.S.; Pennsylvania State University '66, M.S. (1965-1980)

William R. Cashen, Professor of Mathematics and Marshal of the University, Emeritus. University of Alaska '37, B.S.; University of Washington '48, M.A. (1942-1974) Deceased

Bettie H. Clark, Head, Alumni Services and Career Planning and Placement, Emeritus, University of Alaska '35, B.S. (1962-1972)

Vena A. Clark, Associate Professor of Home Economics, Emeritus. Cotner College '25, A.B.; Iowa State University '33, M.S. (1953-1967)

Joan B. Clutts, Professor of Education, Emeritus. Colorado College '51, B.A.; University of Missouri '85, M.Ed.; '69, Ed.D. (1961-1984)

Donald Cook, Professor of Mineral Beneficiation, Emeritus. University of Alaska '47, B.S.; '52, E.M.; Pennsylvania State University '58, M.S.; '60, Ph.D.; P.E. (1957-1979)

Howard A. Cutler, Chancellor and Regents' Professor of Economics, Emeritus. State University of Iowa '40, B.A.; '41, M.A.; Columbia University '51, Ph.D. (1962-1966, 1975-1983)

Don M. Dafoe, Executive Vice President, Emeritus. Valley City State College '37, B.A.; University of Idaho '48, M.S.; Stanford University '61, Ed.D. (1966-1976)

Frank Darnell, Professor of Education, Emeritus. Colorado State University '51, B.S.; University of Alaska '62, M.Ed.; Wayne State University '70, Ed.D. (1966-1978)

Charles W. Davis, Professor of Music, Emeritus. State University of Iowa '37, B.A.; '48, M.A. (1963-1979)

T. Neil Davis, Professor of Geophysics, Emeritus. University of Alaska '55, B.S.; California Institute of Technology '57, M.S.; University of Alaska '61, Ph.D. (1953-1982)

Don H. Dinkel, Professor of Plant Physiology, Emeritus. University of Minnesota '54, B.S.; '60, Ph.D. (1960-1966, 1968-1983)

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)

Robert B. Forbes, Professor of Geology, Emeritus. University of Washington '50, B.S.; '59, Ph.D. (1959-1977)

John C. Gilmore, Professor of Physical Education, Emeritus. Stanford University '54, B.A.; '58, M.A.; '67, Ed.D. (1968-1984)

Bruce R. Gordon, Professor of French and Spanish, Emeritus. Brown University '37, A.B.; New York State College for Teachers '42, M.A.; Syracuse University '50, Ph.D. (1963-1977)

Arnold Griese, Professor of Education, Emeritus. Georgetown University '48, B.A.; University of Miami '57, M.Ed.; University of Arizona '60, Ph.D. (1960-1980)

Victor P. Hessler, Professor of Geophysics, Emeritus. Oregon State University '26, B.S.; Iowa State University '27, M.S.; '34, Ph.D. (1955-1968)

Donald W. Hood, Professor of Marine Science, Emeritus. Pennsylvania State University '40, B.S.; Oklahoma State University '42, M.S.; Texas A&M University '50, Ph.D. (1965-1978)

William Hunt, Professor of History, Emeritus. Seattle University '51, B.S.S.; University of Washington '58, J.D.; '66, M.A.; '67, Ph.D. (1967-1979)

Laurence Irving, Professor of Zoophysiology, Emeritus. Bowdoin College '16, A.B.; '59, D.Sc. (Hon.); Harvard University '17, A.M.; Stanford University '24, Ph.D.; University of Oslo '56, M.D. (Hon.); University of Alaska '68, D.Sc. (Hon.) (1962-1975) Deceased

Laura Jones, Director of Admissions and Registrar, Emeritus. University of Denver '41, B.A. (1956-1971) Deceased.

Charles J. Keim, Professor of Journalism and English, Emeritus. University of Washington '48, B.A.; '50, M.A. (1954-1977)

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) Deceased

James R. Leekley, Senior Scientist in Charge, Petersburg Fur Farm, Emeritus. Oregon State University '38, B.S. (1941-1972)

Charles E. Logsdon, Professor of Plant Pathology, Emeritus. University of Kansas City '42, B.A.; University of Minnesota '54, Ph.D. (1953-1978)

Orlando W. Miller, Professor of History, Emeritus. Muhlenberg College '47, B.A.; Columbia University '48, M.A.; '66, Ph.D. (1957-1978)

Terris Moore, President Emeritus and Professor of the University. Williams College '29, A.B.; Harvard '33, M.B.A.; '37, D.C.S.; University of Alaska '67, LL.D.; (President 1949-1953, Prof. 1953-1972)

Peter R. Morrison, Professor of Zoophysiology, Emeritus. Swarthmore College '40, A.B.; Harvard University '47, Ph.D. (1963-1974)

James E. Morrow, Professor of Zoology, Emeritus. Middlebury College '40, A.B.; '42, M.S.; Yale University '44, M.S.; '49, Ph.D. (1960-1977)

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)

Kenneth M. Rae, Vice President for Research and Professor of Marine Science, Emeritus. University College, London '35, B.Sc.; '58, Ph.D. (1961-1976)

Louis L. Renner, Professor of German, Emeritus. Gonzaga University '50, A.B.; '51, M.A.; University of Santa Clara '58, M.S.T.; University of Munich '65, Ph.D. (1965-1980)

Elbert F. Rice, Professor of Civil Engineering, Emeritus. University of Idaho '48, B.S.; Oregon State College '49, M.S.; '55, Ph.D., P.E. (1952-1982) Deceased

George W. Rogers, Professor of Economics, Emeritus. University of California, Berkeley '42, B.A.; '43, M.A.; Harvard University '50, Ph.D. (1960-1983)

Gerald J. Romick, Professor of Geophysics, Emeritus. University of Alaska '52, B.S.; University of California, Los Angeles '54, M.S.; University of Alaska '64, Ph.D. (1951-1984)

L. J. Rowinski, Director of University of Alaska Museum, Emeritus. Cornell University '51, B.S.; University of Alaska '58, M.S. (1957-1980)

H. Theodore Ryberg, Director of Libraries, Emeritus. Gettysburg College '55, A.B.; Western Reserve University '57, M.S. (1962-1980)

Charles Sargent, Dean, College of Mathematics, Physical Sciences and Engineering, Emeritus. University of Idaho '48, B.S.C.E.; Stanford University '58, M.S. (Professor 1953-1961, Dean 1961-1967)

Herman E. Slotnick, Professor of History, Emeritus. University of Idaho '39, B.A.; University of Washington '58, Ph.D. (1955-1978)

R. London Smith, Professor of Political Science, Emeritus. College of St. Joseph '54, B.A.; University of Oklahoma '55, M.A.; American University '64, Ph.D. (1965-1984)

Agnes S. Sunnell, Associate Professor of Extension, Emeritus. University of Washington '31, B.S.; Washington State University '44, M.S. (1960-1970)

Lola Cremeans Tilly, Professor of Home Economics, Emeritus. University of Illinois '20, A.B.; '21 M.S.; University of Alaska '63, D.Hum. (1929-1937, 1942-1963)

Minnie Wells, Professor of English, Emeritus. University of Missouri '25, B.S.; New York University '38, Ph.D. (1945-1971)

William S. Wilson, Head, Department of General Science, and Professor of Chemistry and General Science, Emeritus. Brown University '31, B.Sc.; '34, M.Sc.; Yale University '36, Ph.D. (1947-1972) Deceased

William R. Wood, President Emeritus. Illinois College '27, A.B.; '60, LL.D. (Hon.); University of Iowa '36, M.A.; '39, Ph.D. (1960-1973)

Faculty and Staff

The date following each name designates the time of original appointment to the University faculty or staff. (Dates of resignations and reappointments are not indicated.)

A second date in parentheses follows each member's present rank and indicates the beginning of service in that rank.

The abbreviation that follows this second date indicates the University of Alaska-Fairbanks unit in which the employee works.

The abbreviations are:

AEIDC	Arctic Environmental Information and Data Center
AFES	Agricultural and Forestry Experiment Station
CHRD	College of Human and Rural Development
CLA	College of Liberal Arts
CNS	College of Natural Sciences
EES/ IWR	Engineering Experiment Station/Institute of Water Resources
GI	Geophysical Institute
IAB	Institute of Arctic Biology
IMS	Institute of Marine Science
LIB	Elmer Rasmuson Library
SALRM	School of Agriculture and Land Resources Management
SENG	School of Engineering
SME	School of Mineral Engineering
SOM	School of Management
STUAFF	Student Affairs
UAM	University of Alaska Museum
VCA	Vice Chancellor for Administration
VCAA	Vice Chancellor for Academic Affairs

Abrahams, Sherry Lynn — 1964 — Associate Professor of Library Science (1975). LIB. Bowling Green State University '58, B.A.; University of Illinois '59, M.S.L.S.

Ahern, Michael B. — 1982 — Head, Department of Military Science and Professor of Military Science (1982). CLA. University of Wyoming '64, B.A.; Niagara University '72, M.S.

Aho, Mary E. — 1974 — Graphics Leader, AEIDC (1978). '66, MDTA Drafting.

Aigner, Jean S. — 1978 — Professor of Anthropology (1978). CLA. University of Wisconsin '64, B.A.; '66, M.A.; 69, Ph.D.

Akasofu, Syun-Ichi — 1958 — Professor of Geophysics (1964), GI. Tohoku University '53, B.S.; '57, M.S.; University of Alaska '61, Ph.D.

Albrecht, C. Earl — 1979 — Affiliate Professor of Medical Science (1979), CNS. Moravian College, Pennsylvania '26, B.A.; Moravian Theological Seminary '28, B.D.; Jefferson Medical College '32, M.D.

Alexander, Barbara — 1977 — Assistant Professor of Art History and Humanities (1977) and Head, Department of Philosophy and Humanities, (1982). CLA. Gymnasium Oldenburg '65, B.A.; University of Zurich '74, M.A.; '75, Ph.D.

Alexander, Caroline — 1981 — Assistant Program Manager, KUAC-TV (1981).

Alexander, Vera — 1962 — Director, Institute of Marine Science (1979); Professor of Marine Science (1974), IMS. University of Wisconsin '55, B.A.; '62, M.S.; University of Alaska '65, Ph.D.

Allen, Lee D. — 1956 — Associate Agricultural Engineer (1972), AFES (Palmer Research Center). University of Idaho '57, B.S.; '72, M.S.

Allison, Carol Wagner — 1970 — Associate Professor of Paleontology (1979), Curator, Paleontological and Geological Collections (1970). UAM. University of California, Berkeley '53, B.A.; '63, M.S.; '70, Ph.D.

Allison, Richard C. — 1968 — Professor of Geology (1975), CNS. University of Washington '57, B.S.; '59, M.S.; University of California '67, Ph.D.

Ammu, Lynne — 1978 — Instructor of Education and Field Coordinator of Cross-Cultural Education Development Program, (1978), CHRD. University of Wyoming '67, B.A.; '73, M.A.

Anderson, James H. — 1970 — Research Associate (1976), IAB. University of Washington '63, B.S.; Michigan State University '70, Ph.D.

Andresen, Patricia A. — 1967 — Associate Professor of Mathematics (1977). CLA. University of Illinois '55, B.S.; University of Missouri '58, M.A.; University of California at Santa Barbara '76, Ph.D.

Angalak, Andrew P. — 1978 — Head, Upward Bound Program (1982), STUAFF. Washington State University '76, B.A.; University of Washington '78, M.S.W.

Arend, Margaret Floyd — 1978 — Science Technician III, Biology/Botany, (1982) AEIDC. Evergreen State College '76, B.A.

Armbruster, W. Scott — 1980 — Assistant Professor of Botany (1983). IAB. University of California, Santa Barbara '72, B.A.; University of California, Davis '77, M.S.; '81, Ph.D.

Artman, Brenda S. — 1979 — Assistant Professor of Library Science (1984). LIB. Shippensburg State College '76, B.S.; Western Michigan University '78, M.S.L.

Arundale, Robert — 1979 — Assistant Professor of Speech Communications (1979). CLA. Rensselaer Polytechnic Institute '63, B.S.; Michigan State University '64, M.S.; '71, Ph.D.

Aspnes, John D. — 1978 — Professor of Electrical Engineering (1981), SENG. University of Wisconsin '65, M.S.; Montana State University '76, Ph.D.; P.E.

Atamian, Sarkis — 1962 — Professor of Sociology and Psychology (1974), CHRD. University of Rhode Island '50, B.S.; Brown University '54, M.A.

Aughenbaugh, Nolan B. — 1983 — Professor of Geological Engineering (1983). Purdue University '55, B.S.C.E.; University of Michigan '59, M.S.; Purdue University, '63, Ph.D.

Badger, Mark O. — 1982 — Videographer, (1982), KUAC-TV.

Bailey, Ira S. — 1982 — Master, R/V ALPHA HELIX (1982), IMS.

Bailey, Ray P. — 1976 — Acting Director, WAMI Program (1985) and Associate Professor of Medical Science (1976), CNS. University of California '66, B.A.; California State '69, M.A.; Johns Hopkins '73, Ph.D.

Bandopadhyay, Sukumar — 1982 — Assistant Professor of Mining Engineering (1982)., SME. Banaras Hindu University, India, '70, B.Sc.; '75, M. Tech.; Pennsylvania State University '79, M.S.; '81, Ph.D.

Barber, Willard E. — 1976 — Assistant Professor of Fisheries (1976), Fisheries and IMS. Arizona State University '65, B.A.; '68, M.S.; Michigan State University '70, Ph.D.

Barnhardt, Raymond J. — 1970 — Professor of Education (1980), CHRD. North Dakota State University '65, B.S.; Johns Hopkins University '67, M.Ed.; University of Oregon '70, Ph.D.

Baron, Mary K. — 1978 — Associate Professor of English (1980), CLA. Brandeis University '69, A.B.; University of Michigan '71, A.M.; University of Illinois '73, Ph.D.

Bartlett, Thomas E. — 1974 — Associate Professor of Accounting (1979), SOM. Southwestern at Memphis '67, B.A.; Emory University '69, M.B.A.; State of Georgia '73, C.P.A.; State of Alaska '78, C.P.A.

Basham, Charlotte S. — 1983 — Instructor of Cross-Cultural Communications (1983), CLA. Arizona State University '67, B.A.; San Jose State University '77, M.A.

Becker, Jr., Richard — 1979 — Science Technician III, Climatology, (1982) AEIDC. Humboldt State University '78, B.A.

Beconovich, Robert M. — 1983 — Lecturer in Business Administration (1983), SOM. University of Alaska '74, B.A.; University of the Pacific, McGeorge School of Law '81, J.D.

Beget, James E. — 1984 — Assistant Professor of Geology (1984), CNS. Columbia University '74, B.S.; University of Washington '77, M.S.; '81, Ph.D.

Benesch, Walter J. — 1963 — Professor of Philosophy (1973), CLA. University of Denver '55, B.A.; University of Montana '56, M.A.; Leopold Franzens Universitat, Innsbruck '63, Ph.D.

Benevento, John — 1979 — Supervisor, Electronic Shop, (1979), GI.

Bennett, F. Lawrence — 1966 — Professor of Engineering Management (1974) and Head, Department of Engineering Management (1983), SENG. Rensselaer Polytechnic Institute '61, B.C.E.; Cornell University '63, M.S.; '66, Ph.D.; P.E.; L.S.

Benson, Carl S. — 1960 — Professor of Geophysics and Geology (1969), CNS. University of Minnesota '50, B.A.; '56, M.S.; California Institute of Technology '60, Ph.D.

Benson, Ruth G. — 1972 — University Nurse Practitioner (1983), STUAFF. Northwestern University '55, B.S. in Nursing; Evanston Hospital School of Nursing '55, Diploma. Advanced Nurse Practitioner '81.

Berman, Gerald S. — 1980 — Associate Professor of Sociology and Social Work (1980), CHRD. University of Michigan '56, B.A.; Case Western Reserve University '63, M.S.W.; '70, Ph.D.

Bernet, John W. — 1959 — Professor of English (1975), CLA. State University of Iowa '51, B.A.; University of North Dakota '57, M.A.; Stanford University '69, M.A.; '69, Ph.D.

Biesiot, Peter G. — 1980 — Professor of Business Administration (1980) and Head, Department of Business Administration, SOM. University of Washington '42, B.A.; University of Nebraska '51, M.S.; Cornell University '58, M.B.A.; University of Southern California '66, D.B.A.

Bird, Roy K. — 1984 — Assistant Professor of English (1984), CLA. Brigham Young University '72, B.A.; '74, M.A.; William Marsch Rice University '82, Ph.D.

Biswas, Nirendra N. — 1971 — Professor of Geophysics (1983), CNS. Geophysical Institute, Indian Institute of Technology, India '55, B.Sc.Hons. '57, M. Tech; University of California, Los Angeles '71, Ph.D.

Bligh, John — 1977 — Director, Institute of Arctic Biology, and Professor of Physiology (1977). University College, London '50, B.S.; University of London '52, Ph.D.; '77, D.Sc.

Booker, John M. — 1983 — Associate Professor of Education and Coordinator, Cross-Cultural Education Development Program (1983),CHRD. University of South Alabama '70, B.A.; Florida State University '75, M.S.; '77, Ph.D.

Borchert, Mary Ann — 1971 — Electron Microscopist (1974), GI. Denison University '62, B.S.; Ohio State University '64, M.S.

Borgeson, Cory — 1983 — Lecturer in Business Administration (1983), SOM. Oakland University '78, B.A.; Drake University School of Law '81, J.D.

Botha, Jan L.— 1985 — Associate Professor of Civil Engineering (1985), SENG. University of Pretoria '72 B.S.; University of California Berkeley '78, M.S.; '80, Ph.D.

Bowling, Sue Ann — 1970 — Assistant Professor of Geophysics (1972), Radcliffe '63, A.B.; University of Alaska '67, M.S.; '70, Ph.D.

Boze, Betsy — 1984 — Assistant Professor of Marketing (1984), SOM. Southern Methodist University '74, B.S.; '75 M.B.A.; University of Arkansas '84, Ph.D.

Boze, Ken — 1984 — Assistant Professor of Accounting (1984), SOM. University of Florida-Gainesville '74 B.S.B.A.; '75, M.B.A.; University of Arkansas-Fayetteville '83, Ph.D.

Bradbury, John A. — 1970 — Scientific Glassblower, (1970) IMS.

Brennen, E. Clifford — 1984 — Professor of Social Work (1984), CHRD. San Francisco State University '56, B.A.; University of California, Berkeley '58 M.S.W.; '68, D.S.W.

Brody, Arthur W. — 1967 — Professor of Art (1984), CLA. Harvey Mudd College '65, B.S.; Claremont Graduate School '67, M.F.A.

Brown, Carol W. — 1975 — Operations Coordinator, Wood Center (1975), STUAFF.

Brown, Edward J. — 1975 — Associate Professor of Water Resources (1983), EES/IWR and Marine Science. University of Minnesota '70, B.S.; University of Wisconsin '73, M.S.; '75, Ph.D.

Brown, Neal — 1966 — Director, Poker Flat Research Range (1983), and Assistant Professor of Geophysics (1969), GI. Washington State University '61, B.S.; University of Alaska '66, M.S.

Bruce, Leroy Ben — 1984 — Instructor of Animal Science (1984), SALRM. New Mexcio State University '73, B.S.; '77, M.S.; '79, Ph.D.

Brundage, Arthur L. — 1968 — Professor of Animal Science (1968), AFES. (Palmer Research Center). Cornell University '50, B.S.; University of Minnesota '52, M.S.; '55, Ph.D.

Buckless, Frances S. — 1982 — Head Coach, Women's Intercollegiate Basketball (1982), Lecturer in Physical Education, CLA. Towson State College '71, B.S.; Trenton State College '74, M.E.

Burnham, James T. — 1982 — Assistant Professor of Mathematics (1982), CLA. San Diego State University '67, A.B.; '70, M.S.; University of Iowa, '72, Ph.D.

Burrell, David Colin — 1965 — Professor of Marine Science (1975), IMS. Nottingham University '61, B.Sc.; '64, Ph.D.

Burton, James R. — 1973 — Supervisor, Photo-Graphics (1983), GI.

Burton, P. Jeffrey — 1982 —Affiliate Instructor of Geological Engineering (1984), SME. University of Alaska '78, B.S.; '81, M.S.

Buske, Frank E. — 1977 — Associate Professor of English (1982) and Head, Department of English, CLA. Yale University '48, B.A.; Arizona State University '70, M.A.; University of California, Davis '76, Ph.D.

Butler-Hopkins, Kathleen M. — 1979 — Associate Professor of Music (1983),CLA. Trinity College of Music, London, England, '71, F.T.C.L.; The Julliard School '75, B.M.; '76, M.M.; Yale University School of Music '78, M.M.A., D.M.A., 1982.

Button, Don K. — 1964 — Professor of Marine Science (1973), IMS. Wisconsin State College '55, B.S.; University of Wisconsin '61, M.S.; '64, Ph.D.

Carling, Donald E. — 1981 — Assistant Professor of Horticulture (1981), AFES. St. Cloud State '67, B.A.; University of Missouri-Columbia '69, M.S.; University of Missouri-Columbia '75, Ph.D.

Carlson, Robert F. — 1965 — Professor of Civil Engineering (1974) and Head, Department of Civil Engineering (1983),SENG. University of Wisconsin '61, B.S.; '63, M.S.; '67, Ph.D.; P.E.; P.L.S.

Cedzo, Karen L. — 1979 — Director of Public Affairs (1979). University of Wisconsin '73, B.A.; '75, M.A.

Champion, Charles A. — 1973 — Adjunct Associate Professor of Petroleum Engineering (1979), SME. Colorado School of Mines '52, B.S.; University of Southern California '62, M.S.; P.E.

Chapin, F. Stuart III — 1973 — Professor of Plant Physiological Ecology (1984), CNS, IAB. Swarthmore College '66, B.A.; Stanford University '73, Ph.D.

Choy, Terence Tin-Ho — 1970 — Professor of Art (1981), CLA. San Francisco State College '65, B.A.; University of California, Berkeley '67, M.A.

Coe, Carrol — 1969 — Launch Officer, Poker Flat Research Range (1969), G1.

Coetzee, Nicolaas F. — 1982 — Associate Professor of Civil Engineering (1982), SENG. University of Natal, Durban, South Africa, '72, B.S.; University of California, Berkeley, '75, M.S.; '79, Ph.D.

Cole, James W. — 1973 — Director, Center for Health and Counseling (1976), STUAFF, Assistant Professor of Education and Assistant Professor of Psychology (1973), CHRD. Chico State College '64, B.A.; Oregon State University '67, M.Ed.; University of North Colorado '71, Ed.D., Licensed Psychologist, '79.

Collins, William Brian — 1980 — Assistant Professor of Range Management, (1982), AFES. Brigham Young University '74, B.S.; Utah State University '77, M.S.; '79, Ph.D.

Comiskey, Albert L. — 1979 — Adjunct Associate Professor of Meteorology, (1979), AEIDC. University of California, Los Angeles '50, B.A.

Comolli, Paul A. — 1983 — Associate Professor of Economics (1981), SOM. Miami University '69, B.S.; Wright State University '71, M.B.A.; Purdue University '72, M.S.; '75, Ph.D.

Conn, Jeffrey S. — 1980 — Research Agronomist (1980), AFES. University of Arizona '73, B.S.; '76, M.S.; North Carolina State University '80, Ph.D.

Connor, William — 1983 — Staff Counselor, Center for Health and Counseling, STUAFF, and Assistant Professor of Psychology, (1983), CHRD. State University College at Cortland, New York '72, B.S.; University of Delaware '74, M.Ed.; University of Missouri-Columbia, '83, Ph.D.

Converse, E. Leanne — 1977 — Adjunct Assistant Professor of Medical Science (1977), CNS. University of Colorado '69, B.A.; '73, M.D.

Cook, Donald J. — 1984 — Acting Dean, School of Mineral Engineering (1984-1985), Director of Mineral Industry Research Laboratory (1984), SME. University of Alaska '47, B.S.; '52, E.M.; Pennsylvania State University '58, M.S.; '60, Ph.D.

Coon, E. Dean — 1974 — Associate Professor of Education (1974), CHRD. University of Northern Colorado '49, B.A.; University of Nebraska '51, M.A.; University of Denver '73, Ed.D.

Cooney, R. Theodore — 1970 — Associate Professor of Marine Science (1976), IMS. University of Washington '64, B.S.; '67, M.S.; '71, Ph.D.

Copus, Gary — 1980 — Associate Professor of Criminal Justice (1974), CLA. Georgia Institute of Technology '67, B.S.; Sam Houston State University '68, M.S.; University of Missouri '72, Ph.D.

Cornwall, Marguerite — 1982 — Instructor of Library Science (1982), LIB. University of Toronto '62, B.A.; University of Michigan '66, A.M.L.S.

Cornwall, Peter G. — 1971 — Head, Department of History and Associate Professor of History (1973), CLA. University of Toronto '62, B.A.; University of Michigan '63, A.M.; '70, Ph.D.

Cowan, Margaret E. — 1982 — Instructor of Education (1984), CHRD and Alaska Sea Week Director/Marine Education Specialist (1982). Cornell University '74, B.S.; University of Michigan '82, M.S.

Cox, Clifford T. — 1980 — Assistant Professor of Accounting (1980), SOM. University of Northern Iowa '71, B.B.A.; Kansas State University '75, M.B.A.; University of Kansas, C.P.A.; University of Iowa '81, Ph.D.

Cridge, Edmund S. — 1977 — Associate Professor of Library Science (1983), LIB. State University of New York, Oswego '62, B.S.; State University of New York, Buffalo '66, M.S.; '70, M.Ed.; '77, Ed.D.

Crosby, April E. — 1983 — Program Planner and Acting Director of Conferences and Institutes (1984-1985). Colorado College '69, B.A.; Vanderbilt University '74, Ph.D.

Crosby, J. Stephen — 1982 — Assistant Professor of Alaska Native Studies and Theater (1982), CLA. Alaska Methodist University '70, B.S.; Florida State University '75, M.F.A.

Crowder, R. Keith — 1983 — Assistant Professor of Geology (1983), CNS. Radford University '78, B.S; University of Arkansas '80, M.S.; University of Iowa '83, Ph.D.

Cuccarese, Sal V. — 1976 — Instructor of Wildlife Biology (1978), CNS. Southwestern '73, A.S.; San Diego State University '75, B.S.

Cullum, Robert Foster — 1982 — Assistant Professor of Agricultural Engineering (1982), AFES. University of Tennessee '77, B.S.; '82, Ph.D.

Daley, Patrick J. — 1982 — Assistant Professor of Journalism and Broadcasting (1982). CLA. University of North Dakota '72, B.A.; University of Iowa '75, M.A.; '83, Ph.D.

Das, Deben K. — 1984 — Assistant Professor of Mechanical Engineering (1984), SENG. Sambalpur University '72, B.S.; Brown University '74, Sc.M.; University of Rhode Island '83, Ph.D., P.E.

Davies, John — 1982 — Adjunct Associate Professor of Geology (1984), CNS. Reed College '67, B.A.; University of Alaska-Fairbanks '70, M.S., '75, Ph.D.

Dean, Frederick C. — 1954 — Professor of Wildlife Management (1966), CNS, and Program Leader, Biology and Resource Management, Cooperative Park Studies Unit, (1972). University of Maine '50, B.S.; '52, M.S.; State University of New York '57, Ph.D.

Dean, Kenneson G. — 1977 — Remote Sensing Geologist, (1979) GI. Northern Arizona University '72, B.S.; University of Alaska '79, M.S.

Decker, John E. — 1981 — Adjunct Assistant Professor of Geology (1984), CNS. University of California, Berkeley '71, B.S.; University of Alaska '75, M.S.; Stanford University '80, Ph.D.

DeCorso, Theodore — 1974 — Professor of Music (1984), CLA. University of Connecticut '65, B.S.; The Juilliard School '67, M.S.; University of Connecticut '77, Ph.D.

Deehr, Charles S. — 1964 — Professor of Geophysics (1981), GI. Reed College '58, B.A.; University of Alaska '61, M.S.; '68, Ph.D.

Degen, Vladimir — 1969 — Associate Professor of Physics (1974), GI. University of Toronto '58, B.A.; '60, M.A.; University of Western Ontario '66, Ph.D.

Dehghani, Kaveh — 1983 — Assistant Professor of Petroleum Engineering (1983), SME. Abadan Institute of Technology '75, B.S.; University of Southern California '78, M.S.; '83, Ph.D.

Delana, Brett S. — 1973 — Head, Technical Services (1983), GI. Oregon State University '71, B.S.E.E.; University of Alaska '73, M.S.

Delpit, Lisa D. — 1984 — Assistant Professor of Education (1984), CHRD. Antioch College '74, B.A.; Harvard University '80, Ed.M.; '84, Ph.D.

Demmert, Dennis — 1974 — Director, Native Studies (1978), CLA. Harvard University '72, Ed.M.

DiCecco, Bruno — 1981 — Associate Professor of Music (1983), CLA. Yale University School of Music, '57, B.M.; '58, M.M.

Dickey, Terry P. — 1973 — Coordinator of Education and Public Service, UAM. (1976). University of Tulsa '66, B.A.

Diehl, Carol S. — 1982 — Staff Counselor, Center for Health & Counseling, STUAFF and Assistant Professor of Counseling (1982), CHRD. Juniata College '71, B.A.; West Virginia University '75, M.A.; '81, Ed.D.

Dieter, Emma R. — 1962 — Assistant Director for Coastal and Marine Operations (1982), IMS. DePaul University '59, B.S.

Dieterich, Robert A. — 1967 — Professor of Veterinary Science (1967), IAB. University of California '61, B.S.; '63, D.V.M.

Dillon, John T. — 1978 — Adjunct Assistant Professor of Geology (1984), CNS. California State University '70, B.S.; University of California, Santa Barbara '76, Ph.D.

Distad, Jack — 1955 — Acting Dean, College of Liberal Arts (1984-1985) and Professor of Mathematics (1974). Montana State University '53, B.S.; '55, M.S.

Dixon, E. James — 1974 — Associate Professor of Archeology (1982), Curator, UAM, Archeological Collection (1974). University of Alaska '70, B.A.; '72, M.A.; Brown University '79, Ph.D.

Douglas, Claudia — 1984 — Instructor of Education and Clinical Experience Coordinator (1984), CHRD. University of Alaska-Fairbanks '74, B.Ed.; '82, M.Ed.

Drew, James V. — 1976 — Acting Vice Chancellor for Academic Affairs (1985), Dean, School of Agriculture and Land Resources Management and Director, Agricultural and Forestry Experiment Station, and Professor of Agronomy (1976). Rutgers University '52, B.S.; '57, Ph.D.

Dubbs, Patrick J. — 1968 — Associate Professor of Education and Head, Department of Rural Development (1982), CHRD. University of Notre Dame '60, B.A.; Michigan State University '75, Ph.D.

Duff, John A. — 1980 — Assistant Professor of Music (1980), CLA. University of Washington '73, B.A.; B.Mus; Michigan State University '78, M.M.; '82, Ph.D.

Dupras, Joseph A. — 1979 — Associate Professor of English (1984), CLA. University of Maryland '68, B.A.; State University of New York at Binghamton '70, M.A.; '75, Ph.D.

Dupras, Rheba — 1981 — Assistant Professor of Library Science (1981), LIB. Marietta College '73, B.A.; State University of New York at Binghamton '75, M.A.; University of Kentucky '79, M.S.L.S.

Egan, Robert H. — 1967 — Head, Career Planning and Placement (1974) and Assistant Professor of Psychology (1976), CHRD. University of Montana '60, B.A.; California State College at Long Beach '65, M.A.

Eise, John Stephen — 1982 — Science Technician III, Meteorology, (1982), AEIDC. St. Louis University '77, B.S.

Ek, Michael B. — 1983 — Science Technician III, Meteorology, (1983), AEIDC. Oregon State University '82, M.S.

Elder, Sarah M. — 1973 — Assistant Professor of Cinematography (1982), Co-Director Alaska Native Heritage Film Project, UAM. Sarah Lawrence College '69, B.A.; Brandeis University '72, M.F.A.

Elliot, Nan E. — 1980 — Assistant Professor, Science Writer, (1980), AEIDC. Williams College '73, B.A.

Elsner, Elizabeth F. — 1974 — University Physician (1976) and Affiliate Associate Professor of Medical Science (1977), CNS. Mount Holyoke College '45, A.B.; Yale University School of Medicine '48, M.D.

Elsner, Robert — 1973 — Professor of Marine Science (1973), IMS and IAB. New York University '50, B.A.; University of Washington '55, M.S.; '59, Ph.D.

Emmert, Reginald A. — 1969 — Cinematographer in charge of motion picture, video, and still pictures services (1969), LIB. Michigan State University '67, B.S.; Central Michigan University '77, M.A.

Ensign, Jr. Walter G. — 1969 — Head, Department of Speech and Drama, Professor of Theatre and Drama (1984), CLA. University of Denver '66, B.A.; '67, M.A.

Epps, Alan C. — 1969 — Professor of Natural Resources (1980), SALRM. Montana State University '66, B.S.; '69, M.S.

Erickson, Melody A. — 1981 — Family Housing Officer (1981), STUAFF. University of Alaska '73, B.A.

Ernst, Rolf — 1974 — Director of Auxiliary Services (1976), VCA. Idaho State University '68, B.S.

Esmailka, Wendy J. — 1978 — Instructor of Education and Field Coordinator for the Cross-Cultural Education Development Program (1978), CHRD. State University College of New York, Buffalo, '75, B.S.; Harvard University, Graduate School of Education, '78, M.Ed.

Estes, Steven A. — 1975 — Research Associate, (1978) GI. University of Hawaii '72, B.S.E.E.; '74, B.S.; University of Alaska '78, M.S.

Estle, John B. — 1982 — Head Coach, Men's and Women's Cross-Country Running and Skiing (1982), Lecturer in Physical Education, CLA. Middlebury College '74, B.A.

Failoni, Daniel D. — 1975 — Affiliate Assistant Professor of Medical Science (1975), CNS. Western Reserve University '61, The Ohio State University '65, M.D., M.S.

Falk, Marvin W. — 1975 — Associate Professor of Library Science (1976), LIB. University of Minnesota '65, B.A.; University of Massachusetts '66, M.A.; University of Iowa '76, Ph.D.

Fath, Robert — 1983 — Assistant Professor of Military Science (1983), CLA. LaSalle College '73, B.S.; Florida Institute of Technology '82, M.A.

Fay, Francis H. — 1970 — Professor of Marine Science (1983), IMS and IAB. University of New Hampshire '50, B.S.; University of Massachusetts '52, M.S.; University of British Columbia '55, Ph.D.

Feder, Howard M. — 1970 — Professor of Marine Science (1970), IMS and CNS. University of California at Los Angeles '48, A.B.; '51, M.A.; Stanford University '56, Ph.D.

Feist, Carol F. — 1972 — Associate Professor of Microbiology (1982), CNS. University of Cincinnati '60, B.A.; Rice University '63, M.S.; University of California, Berkeley '68, Ph.D.

Feist, Dale D. — 1971 — Professor of Zoophysiology (1983), IAB. University of Cincinnati '60, A.B.; University of California, Berkeley '69, Ph.D.

Fink, Milton A. — 1968 — Head, Department of Accounting, and Professor of Accounting (1981), SOM. University of Nebraska '58, B.S.; University of Denver '66, M.S.B.A.; Colorado '66, C.P.A., Alaska '69, C.P.A.

Flanagan, Patrick W. — 1968 — Professor of Microbiology (1978), IAB. Dublin University '64, B.S.; McGill University, Montreal '68, Ph.D.

Flanders, Nicholas E. — 1983 — Assistant Professor of Education, Department of Rural Development (1983), CHRD. University of New Mexico '74, B.A.; University of Maine '77, M.S.; Columbia University '79, M.A.; '83, Ph.D.

Florian, Dale A. — 1979 — Director of Security (1979), VCA. Santa Rosa Junior College '72, A.A.; F.B.I. National Academy '74; University of Nevada, Las Vegas '79, B.A.

Follmann, Erich H. — 1976 — Research Associate (1979), IAB. Loyola University, Chicago '65, B.S.; Southern Illinois University '68, M.A.; '73, Ph.D.

Foster, Nora Rakestraw — 1981 — Coordinator, Aquatic Collection (1981), UAM. University of Alaska-Fairbanks '69, B.S.; '79, M.S.

Fox, John D. — 1973 — Assistant Professor of Land Resources (1973), SALRM. Trinity College '68, B.S.; University of Washington '70, M.S.; '76, Ph.D.

Fox, John F. — 1977 — Assistant Professor of Biometrics (1977), IAB. Johns Hopkins University '67, A.B.; University of Chicago '70, M.S.; '74, Ph.D.

Fredston, Jill A. — 1982 — Instructor of Glaciology, Snow and Ice, (1984), AEIDC. Dartmouth College '80, B.A. University of Cambridge '82, M.S.

French, Virginia D. — 1983 — Adjunct Assistant Professor of Communiction Sciences (1983), AEIDC. University of Maryland '75, M.A.

Frentzen, Ann — 1983 — Assistant Professor of Cross-Cultural Communications (1983), CLA. Macalester College '71, B.A.; School for International Training '75, M.A.; Teachers College, Columbia University '82, Ph.D.

Frith, Nancy E. — 1971 — Assistant Professor of Physical Education (1971), CLA. Oklahoma State University '63, B.S.E.; '65, M.S.

Fritts, David C. — 1981 — Assistant Professor of Geophysics (1981), GI. Carleton College '71, B.A.; University of Illinois '73, M.S.; '77, Ph.D.

Fuller, William B. — 1972 — Associate Professor of Civil Engineering (1976), SENG. University of Alaska '59, B.S.; '64, M.S., P.E.

Gaffney, Michael J. — 1974 — Associate Professor of Alaska Native Studies (1979), CLA. San Francisco State College '63, B.A.; University of California at Los Angeles '68, M.A.; '73, Ph.D.

Gallagher, Thomas J. — 1984 — Assistant Professor of Regional and Land Use Planning (1984), SALRM. University of Oregon '69, B.L.A.; University of Michigan '74, M.S.; '77, Ph.D.

Garber, Bart — 1984 — Assistant Professor of Alaska Native Studies and Political Science (1984), CLA. University of Oregon '77, B.S.; George Washington University '81, J.D.

Gasbarro, Anthony F. — 1975 — Instructor of Forest Management, (1980), SALRM. Project Coordinator in Forestry and Land Resources Management (1975). Colorado State University '62, B.S.

Gatterdam, Ronald W. — 1982 — Professor of Computer Science (1982), CLA. California Institute of Technology '61, B.S.; University of Southern California '65, M.A.; University of California Irving '70, Ph.D.

Gedney, Larry D. — 1966 — Associate Professor of Geophysics (1972), GI. University of Nevada '60, B.S.; '66 M.S.

Geiman, Robert H. — 1980 — Director of Libraries and Professor of Library Science (1980), LIB. Moody Bible Institute '58, Diploma; Michigan State University '61, B.A.; Carnegie-Mellon University '62, M.L.S.

Geist, Charles R. — 1974 — Professor of Psychology (1984), CHRD. University of San Diego '68, B.S.; University of Montana '73, M.A.; '75, Ph.D.

Genaux, Charles T. — 1953 — Associate Professor of Chemistry (1970), CNS. Iowa State College '50, B.S.; University of Rochester '53, M.S.; University of Alaska '69, Ph.D.

George, Thomas H. — 1973 — Applications Specialist, (1976), GI. Oregon State University '73, B.S.

Gibler, Donald D. — 1984 — Instructor of Chemistry (1984), CNS. Westminster College '65, B.A.; Princeton University '73, Ph.D.

Gilmore, Perry — 1985 — Assistant Professor of Education (1985), CHRD. Temple University '66, B.S.; '76, M.S.; University of Pennsylvania '82, Ph.D.

Gislason, Gary A. — 1970 — Professor of Mathematics (1984), CLA. University of Alaska '66, B.S.; University of Oregon '68, M.S.; '70, Ph.D.

Glaum, Lawrence W. — 1984 — Associate Professor of Civil Engineering (1984), SENG. University of Illinois '69, B.S.; '70, M.S.; University of Illinois '75, Ph.D.

Gleason, Gerald E. — 1977 — Professor of Business Administration and Director, MBA Program (1977), SOM. Creighton University '48, B.S.C.; University of Nebraska '50, M.A.; '61, Ph.D.

Godbole, Sanjay P. — 1983 — Assistant Professor of Petroleum Engineering (1983), SME. University of Bombay, India '79, B.S.; University of Pittsburgh '81, '82, M.S.; '83, Ph.D.

Goering, John J. — 1962 — Professor of Marine Science (1968), IMS. Bethel College '56, B.S.; University of Wisconsin '60, M.S.; '62, Ph.D.

Gold, Carol — 1980 — Associate Professor of History (1983), CLA. Antioch College '64, B.A.; University of Wisconsin '67, M.A.; '75, Ph.D.

Gollogly, James G. — 1980 — Affiliate Assistant Professor of Medical Science (1980), CNS. St. Andrews, Scotland '68, B.Sc.; Trinity College, Dublin '72, M.B., B.Ch.B.A.O.

Goniwiecha, Mark C. — 1983 — Instructor of Information Science (1983), LIB. Grand Valley State Colleges '71, B.Ph.; University of California, Berkeley '82, M.L.I.S.

Gosink, Joan P. — 1979 — Assistant Professor of Geophysics (1981), GI. Massachusetts Institute of Technology '62, B.S.; Old Dominion University '73, M.S.; University of California, Berkeley '79, Ph.D.

Gosink, Thomas A. — 1973 — Research Associate, (1978), GI. Miami University '59, B.A.; Massachusetts Institute of Technology '62, M.S.; Oregon State University '65, Ph.D.

Gottehrer, Dean M. — 1977 — Associate Professor of Journalism (1982), CLA. Tulane University '63, B.A.; Columbia University Graduate School of Journalism '69, M.S.

Grant, Joanne S. — 1976 — Programmer Analyst I, (1978), AEIDC.

Grauman, David S. — 1974 — Adjunct Assistant Professor of Medical Science (1977), CNS. University of Arizona '65, B.S.; Tulane University '69, M.D.

Green, Kenneth D. — 1979 — Assistant Professor of Psychology (1979), CHRD. Furman University '74, B.A.; University of Georgia '78, M.S.; '79, Ph.D.

Greiner, Ida B. — 1974 — Director of Financial Aid (1974), STUAFF.

Griffith, Marilyn — 1984 — Assistant Professor of Plant Physiology (1984), SALRM. Mount Holyoke College '75, B.A.; Yale School of Forestry and Environmental Studies '77, M.F.S.; University of Minnesota '81, Ph.D.

Gross, Joseph J. — 1979 — Assistant Professor of Social Anthropology (1979). Idaho State University '68, B.S.; University of Rochester '74, Ph.D.

Grubis, Stephen E. — 1974 — Assistant Professor of Education (1974), CHRD. Bridgewater State College '66, B.A.; Alaska Methodist University '69, M.A.T.; University of Alaska '71, Ed.S.; Simon Fraser '80, Ph.D.

Gunter, Pauline — 1979 — Assistant Professor of Library Science (1982), LIB. Wheaton College '66, B.A.; Columbia University '78, M.S.

Guthrie, R. Dale — 1963 — Professor of Zoology (1970), University of Illinois '58, B.S.; '59, M.S.; University of Chicago '63, Ph.D.

Guzy, Walter A. — 1976 — Department of Security, Captain (1978), VCA. Interior Alaska Police Academy; University of Alabama; University of Alaska.

Hafen, Marguerite — 1984 — Assistant Professor of Computer Science (1984), CLA. University of New Mexico '68, B.A.; Western State University '71, M.S.; Texas A & M University '78, Ph.D.

Hageman, Jr., Andrew H. — 1981 — Assistant Professor of Business Administration (1981) and a joint appointment with Alaska Native Studies (1983), SOM/CLA. University of Rochester '68, B.A.; State University of New York, Buffalo '77, M.B.A.,; '85, Ph.D.

Hagstrom, David — 1985 — Associate Professor of Education (1985), CHRD. Grinnell College '57, B.A.; Harvard University '58, M.A.T.; University of Illinois '66, Ed.D.

Hales, David A. — 1972 — Associate Professor of Library Science (1976), LIB. Brigham Young University '66, B.S.; Drexel University '68, M.L.S.; University of Pennsylvania '72, M.A.

Hallinan, Thomas J. — 1965 — Associate Professor of Geophysics (1981), GI. Cornell University '64, B.S.E.E.; University of Alaska '69, M.S.; '76, Ph.D.

Hamil, Brenton M. — 1984 — Professor of Geological Engineering (1984), SME. University of Michigan '53, B.S.; '55, M.S.; University of Utah '67, Ph.D.

Haneman, Vincent S. — 1980 — Dean, School of Engineering and Professor of Mechanical Engineering (1980). Massachusetts Institute of Technology '47, B.S.; University of Michigan '50 M.S.E. (Ae); '56 Ph.D. (Ae).

Hanson, Howard L. — 1971 — Student Loan, Bond and Endowment Accountant (1978), VCA. University of Washington '70, B.A.

Hanson, Warren W. — 1982 — Associate Professor of Civil Engineering (1982), SENG. University of Alaska '70, B.S.; Colorado State University '73, M.S.

Harris, Alice — 1980 — Professor of English (1984), CLA. University of Chattanooga '67, B.A.; University of Tennessee '68, M.A.; '71, Ph.D.

Harrison, Barbara — 1981 — Assistant Professor of Cross-Cultural Education, Cross-Cultural Development Program (1981), CHRD. University of Illinois '67, B.A.; University of Alaska-Fairbanks '79, M.A.T.; University of Oregon '81, Ph.D.

Harrison, William D. — 1972 — Professor of Physics (1982), GI. Mt. Allison University '58, B.Sc.; University of London '60, B.Sc. (Special); California Institute of Technology '66, Ph.D.

Hartman, Charles W. — 1967 — Executive Officer, (1978), SALRM. Rutgers University '64, B.A.; University of Alaska '67, B.S.

Hassler, Thomas J. — 1978 — Associate Professor of Information Science (1981), LIB. Indiana University of Pennsylvania '67, B.A.; University of Pittsburgh '68, M.L.S.

Hawkins, Daniel B. — 1967 — Professor of Geology (1972), CNS. Montana State College '56, B.S.; '57, M.S.; Pennsylvania State University '61, Ph.D.

Hawkins, JoAn H. — 1984 — Financial Aid Adviser (1984), STUAFF. University of Alaska-Fairbanks '83, B.S.

Haymon, Jr. Elmer — 1980 — Assistant Professor of Education (1980), CHRD. Shaw University '70, B.A.; University of Pittsburgh, '73, M.Ed.; '74, Ed.S.; '78, Ph.D.

Head, Thomas J. — 1965 — Professor of Mathematics (1965), CLA. University of Oklahoma '54, B.S.; '55, M.A.; University of Kansas '62, Ph.D.

Heckman, Marsha D. — 1984 — Financial Aid Adviser (1984), STUAFF. Kearney State College '69, B.A.; University of Alaska-Fairbanks '81, M.E.D.

Hedrick, Basil C. — 1980 — Director of University of Alaska Museum (1980) and Professor of History (1982). Augustana College '56, A.B.; University of Florida '57, M.A.; Inter-American University '65, Ph.D.

Helfferich, Carla — 1967 — Editor, The Northern Engineer (1977), GI. University of Alaska '65, B.A.

Helfferich, Merritt R. — 1966 — Assistant to the Chancellor (1983). University of Alaska '66, B.A.

Helm, Dot — 1980 — Plant Synecologist (1982), AFES. (Palmer Research Center). University of Delaware '69, B.S.; University of Michigan '70, M.S.; Colorado State University '77, M.S.; '81, Ph.D.

Helms, Andrea R. C. — 1973 — Associate Professor of Political Science (1975), CLA. University of Connecticut '65, B.A.; '66, M.A.; '68, Ph.D.

Henrichs, Susan M. — 1982 — Assistant Professor of Marine Science (1982), IMS. University of Washington '75, B.S.; Woods Hole Oceanographic Institution — Massachusetts Institute of Technology Joint Program '80, Ph.D.

Hensel, Richard J. — 1980 — Associate Professor of Wildlife Biology, (1980), AEIDC. Utah State University '56, B.S.

Herlugson, Mary Lou — 1983 — Research Associate, Animal Science (1983). New Mexico Institute of Mining and Technology '74, B.S.

Herman, Pamela — 1982 — Coordinator, Rural Alaska Honors Institute (1982), CLA. Skidmore College '68, B.S.; Boston University Law School '72, B.F.A.; '78, M.Ed.

Hickok, David M. — 1970 — Director, Arctic Environmental Information and Data Center (1972). Syracuse University '47, B.S.

Highsmith, Raymond C. — 1983 — Associate Professor of Marine Science (1983), IMS. University of Iowa '72, B.A.; University of Washington '79, Ph.D.

Hills, Alex — 1984 — Associate Professor of Electrical Engineering (1984), SENG. Rensselaer Polytechnic Institute '64, B.S.; Arizona State University '69, M.S.; Carnegie-Mellon University '79, Ph.D.

Hoch, Betty — 1973 — Fiscal Officer, Budget (1978), VCA.

Holleman, Dan Foy — 1969 — Radiobiologist (1969), IAB. Howard Payne College '61, B.S.; New Mexico Highlands '65, M.S.; Colorado State University '66, M.S.; '69, Ph.D.

Hollerbach, Wolf — 1965 — Professor of French and Spanish (1973) and Head, Department of Linguistics and Foreign Languages, CLA. Universite de Rennes '61, Doctorat d'Universite, University of Bonn '62, Wissenschaftliches Staatsexamen.

Holloway, Patricia S. — 1984 — Assistant Professor of Horticulture (1984), SALRM. Millersville University '73, B.A.; Washington State University '76, M.S.; University of Minnesota '82, Ph.D.

Hooper, Robert A. — 1984 — Producer/Reporter, KUAC-TV (1984). University of California, San Diego '69, B.A.; University of California, Davis '74, J.D.; University of California, Los Angeles '82, M.F.A.

Hopkins, David M. — 1985 — Distinguished Professor of Quaternary Studies (1985), CNS. University of New Hampshire '42, B.S.; Harvard University '48, M.S.; '55, Ph.D.

Hopkins, John R. — 1979 — Assistant Professor of Music (1979), CLA. Beth College '69, B.A.; University of Iowa '76, M.A.; '82 D.M.A.

Hoskins, Leo Claron — 1965 — Professor of Chemistry (1975) and Head, Department of Chemistry, CNS. Utah State University '62, B.S.; Massachusetts Institute of Technology '65, Ph.D.

Huang, Scott L. — 1981 — Assistant Professor of Geological Engineering (1981), SME. Cheng-Kung University, Taiwan, '74, B.S.; University of Kentucky, '78, M.S.; University of Missouri, Rolla, '81, Ph.D.

Hunsucker, Robert D. — 1958 — Professor of Geophysics and Electrical Engineering (1978), GI. Oregon State University '54, B.S.; '58, M.S.; University of Colorado '69, Ph.D.

Husby, Fredric M. — 1975 — Associate Professor of Animal Science (1975), AFES. Washington State University '66, B.S.; '69, M.S.; '73, Ph.D.

Ittner, Dwight R. — 1975 — Librarian (1975), LIB. Fort Hays Kansas State College '65, B.S.; '67, M.S.; University of Arizona '71, M.L.S.

Jacobson, Steven A. — 1974 — Associate Professor of Yupik (1984), CLA. University of California '66, B.A.; '71, M.A.

Jacobson, William C. — 1971 — Proposal Coordinator (1979), VCA. University of Alaska '58, B.B.A.

Jayaweera, Kolf — 1970 — Acting Dean, College of Natural Sciences (1984-1985), Professor of Geophysics (1981), GI. University of Ceylon '60, B.Sc.; University of London '65, Ph.D.

Jensen, Kathryn P. — 1974 — General Manager KUAC-FM-TV (1982). University of Alaska '74, B.A.

Johansen, Nils I. — 1971 — Associate Professor of Geological Engineering (1976), SME. Purdue University '66, B.S.C.E.; '67, M.S.C.E.; '71, Ph.D., P.E.

Johnson, Clara — 1983 — Adviser/Counselor, Rural Student Services (1983), STUAFF. University of Alaska-Fairbanks '68, B.A.; Portland State University '73, M.S.W.

Johnson, James — 1974 — Professor of Music (1983), CLA. University of Arizona '70, B.M.; '72, M.M.; '76, D.M.A.

Johnson, Ronald A. — 1976 — Associate Professor of Mechanical and Environmental Quality Engineering (1976), SENG. Brown University '65, Sc.B.; Cornell University '66, M.S.; '69, Ph.D.

Johnson, Walter R. — 1981 — Assistant Professor of Marine Science (1981), IMS. University of Miami '72, B.S.; '75, M.S.; University of Delaware '81, Ph.D.

Johnston, Thomas F. — 1973 — Professor of Music (1981), CLA. California State University, Hayward '68, M.A.; California State University, Fullerton '72, M.A.; Witwatersrand University, Johannesburg '72, Ph.D.

Jordan, Paul — 1984 — Associate Professor of Business Administration (1984), SOM. City College of New York '63, B.S.; University of Iowa '65, M.S.; North Carolina State University '81, Ph.D.

Jozwiak, Eric A. — 1976 — Student Housing Officer (1976), STUAFF. University of Alaska '75, B.A.; University of Alaska '77, M.Ed.

Jubenville, Alan — 1979 — Associate Professor of Resource Management (1979), SALRM. North Carolina State College '62, B.S.; West Virginia University '64, M.S.; University of Montana '70, Ph.D.

Juday, Glenn Patrick — 1978 — Visiting Associate Professor of Plant Ecology (1981), SALRM. Purdue University '72, B.S.; Oregon State University '76, Ph.D.

Kamerling, Leonard J. — 1971 — Project Coordinator (1974) Alaska Native Heritage Film Project, UAM.

Kan, Joseph R. — 1972 — Head, Department of Space Physics and Atmospheric Sciences (1984), Professor of Geophysics (1981), GI. Cheng-Kung University '61, B.S.; Washington State University '66, M.S.; University of California, San Diego '69, Ph.D.

Kane, Douglas L. — 1971 — Associate Professor of Water Resources and Civil Engineering (1981), EES/IWR. University of Wisconsin '66, B.S.C.E.; '68, M.S.C.E.; University of Minnesota '75, Ph.D., P.E.

Kastelic, Carol P. — 1983 — Director of Women's Center (1983), STUAFF.

Kastella, Kenneth G. — 1977 — Associate Professor of Medical Science (1977), CNS. University of Washington '59, B.S.; '65, M.S.; '69, Ph.D.

Kawasaki, Koji — 1980 — Assistant Professor of Geophysics, (1981), GI. University of California, Berkeley '60, B.A.; University of Alaska '67, M.S.; '71, Ph.D.

Keller, John W. — 1979 — Assistant Professor of Chemistry (1979), CNS. Ohio State University '68, B.S.; University of Wisconsin '76, Ph.D.

Kelley, John J. — 1971 — Associate Professor of Marine Science (1979), IMS. Pennsylvania State University '58, B.S.; University of Nagoya, Japan '74, Ph.D.

Kelly, Michael D. — 1980 — Instructor of Fisheries Biology, (1980), AEIDC. Oregon State University '75, M.S.

Kelsey, Larry L. — 1983 — Chief Instructor of Military Science (1983), CLA.

Kessel, Brina — 1951 — Professor of Zoology (1959), Curator of Terrestrial Vertebrate Collection (1972), UAM. Cornell University '47, B.S.; University of Wisconsin '49, M.S.; Cornell University '51, Ph.D.

Keyes, W. Ronald — 1972 — Head, Wood Center and Student Activities (1972), STUAFF. Oregon College of Education '66, B.S.; Oregon State University '69, M.S.

Kienle, Juergen — 1965 — Professor of Geophysics (1983), GI. Swiss Federal Institute of Technology E.T.H., '64, Diploma; University of Alaska '69, Ph.D.

Kinney, Thomas C. — 1983 — Associate Professor of Civil Engineering (1983), SENG. University of Washington '65, B.S.C.E.; '66, M.S.C.E.; University of Illinois '79, Ph.D.

Kipphut, George W. — 1981 — Assistant Professor of Marine Science (1981), IMS. Providence College '69, B.S.; Columbia University '78, Ph.D.

Kirts, Carla A. — 1981 — Assistant Professor of Agricultural Education (1981), AFES. Virginia Polytechnic Institute and State University '76, B.S.; '77, M.S.; University of Missouri-Columbia '81, Ph.D.

Klebesadel, Leslie J. — 1984 — Professor of Agronomy (1984), AFES (Palmer Research Center). University of Wisconsin '55, B.S.; '56 M.S.; '58, Ph.D.

Klein, David R. — 1962 — Leader, Alaska Cooperative Wildlife Research Unit, and Professor of Wildlife Management (1962), IAB. University of Connecticut '51, B.S.; University of Alaska '53, M.S.; University of British Columbia '63, Ph.D.

Kleinfeld, Judith S. — 1969 — Professor of Psychology (1978), CHRD. Wellesley College '66, B.A.; Harvard University '67, Ed.M.; '69, Ed.D.

Klyce, Richard — 1981 — Theater Technical Director (1981), CLA. University of Denver '78, B.A.

Knight, Charles W. — 1978 — Instructor of Agronomy (1978), SALRM. Kansas State University '70, B.S.; '71, M.S.

Kokjer, Kenneth J. — 1970 — Associate Professor of Electrical Engineering and Biophysics (1976), SENG. Nebraska Wesleyan University '63, B.A.; University of Illinois '66, M.S.; '70, Ph.D.

Koo, John H. — 1969 — Professor of Linguistics and Japanese (1982), CLA. Tongkook University (Korea) '56, B.A.; '58, M.A.; University of Texas '65, M.A.; Indiana University '70, Ph.D.

Koolstra, John — 1981 — Assistant Professor of Philosophy (1981), CLA. Kenyon College '65, B.A.; University of Alberta '67, M.A.; Cornell University '71, Ph.D.

Kozycki, Lawrence V. — 1982 — Supervisor, Machine Shop, (1982), GI..

Krauss, Michael E. — 1960 — Professor of Linguistics (1968), CLA. University of Chicago '53, B.A.; Western Reserve University '54, B.A.; Columbia University '55, M.A.; University of Paris '56, Certificat d' Etudes Superieures; Harvard University '59, Ph.D. Baccalaureatus Philologiae Islandicae, Haskoli Islands, '60.

Krejci, Rudolph W. — 1960 — Professor of Philosophy (1969), CLA. Leopold Franzens Universitat, Innsbruck '59, Ph.D.

Kwachka, Patricia — 1979 — Assistant Professor of Cross Cultural Communications, Alaska Native Programs (1979), CLA. University of Florida, Gainsville, B.A. '64; M.A. '70; Ph.D. '82.

LaBelle, Joseph C. — 1974 — Assistant Professor of Geomorphology, (1978), AEIDC. University of Massachusetts '69, B.S.

Lake, Joseph B. — 1969 — Manager Accounting and Business Operations, Business Office (1977), VCA. University of Michigan '52, B.A.; Indiana University '62, Accounting Certificate.

Lambert, John P. — 1982 — Assistant Professor of Mathematics (1982), CLA. University of Cincinnati '64, B.S.; University of New Mexico '68, M.A.; Claremont Graduate School '82, Ph.D.

Lando, Barbara M. — 1969 — Professor of Mathematics (1982), CLA. Georgian Court College '62, B.A.; Rutgers University '64, M.S.; '69, Ph.D.

Lando, Clifton A. — 1969 — Associate Professor of Mathematics (1973), CLA. Lehigh University '62, B.A.; Rutgers University '64, M.S.; '69, Ph.D.

LaParle, Gerard — 1982 — Instructor of Business Administration (1982), SOM. University of Alaska-Fairbanks '76, A.A.; '77, B.A.; '77, B.A.; University of Colorado, Boulder '80, J.D.

LaPerriere, Jacqueline Doyle — 1972 — Assistant Professor of Fisheries and Assistant Leader, Alaska Cooperative Fishery Research Unit (1980), IAB. University of Massachusetts '64, B.S.; Iowa State University '71, M.S.; '81, Ph.D.

Larsen, Dinah Wolfe — 1967 — Coordinator of Ethnology (1983). UAM. University of Iowa '61, B.A.; University of California, Los Angeles '75, M.A.

Laughlin, Winston M. — 1949 — Soil Scientist U.S.D.A., (1949), AFES. (Palmer Research Center). University of Minnesota '41, B.S.; Michigan State University '47, M.S.; '49, Ph.D.

Laursen, Gary A. — 1976 — Visiting Assistant Professor of Microbiology (1980), SALRM. Western Washington State University '65, B.A.; University of Montana '70, M.S.; Virginia Polytechnic Institute and State University '75, Ph.D.

Lawrence, Edwin W. — 1983 — Director of Athletics and Recreation (1983), CLA. West Chester University '58, B.S.; Villanova University '67, M.A.

Lay, J. Stephen — 1979 — Public Information Officer (1981). Trinity University, San Antonio '69, B.A.

Lecomte, Serge — 1979 — Assistant Professor of Russian (1979), CLA. University of Alabama '70, B.A.; Vanderbilt University '71, M.A.; '74, Ph.D.

Lee, Jonah Y.H. — 1984 — Assistant Professor of Mechanical Engineering (1984), SENG. Chung Yuan College '73, B.S.; South Dakota School of Mines and Technology '79, M.S.; Iowa State University '83, Ph.D.

Lee, Lou-Chuang — 1978 — Associate Professor of Physics (1982), GI. National Taiwan University '69, B.S.; California Institute of Technology '72, M.S.; '75, Ph.D.

Leipzig, John S. — 1982 — Assistant Professor of Speech Communication (1982), CLA. Western Michigan University '69, B.A.; University of South Florida '74, M.A.; Kent State University '80, Ph.D.

Leslie, Lynn D. — 1982 — Instructor of Meteorology and Oceanography (1984), AEIDC. SUNY-Brockport '74, B.S.; SUNY-Buffalo '79, B.S.; University of Miami '82, M.S.

Lewis, Carol E. — 1973 — Associate Professor of Resource Management (1973), AFES. University of Florida '62, B.S.; '64, M.S.; Georgetown University '71, Ph.D.; University of Alaska '76, M.B.A.

Lin, Biing-Hwan — 1983 — Assistant Professor of Economics (1983), SOM.. National Taiwan University '76, B.S.; Oregon State University '80, M.S.; '84, Ph.D.

Lincoln, Tamara P. K. — 1976 — Assistant Professor of Library Science (1979), LIB. University of Illinois '61, B.F.A.; '64, M.A.; Northern Illinois University '76, M.L.S.

Lipka, Jerry M. — 1981 — Assistant Professor of Education and Field Coordinator for the Cross-Cultural Education Development Program (1981), CHRD. City College, New York, '66, B.B.A.; '69, M.B.A.; University of Massachusetts, Amherst '80, Ph.D.

Lokken, Donald A. — 1970 — Associate Professor of Chemistry (1975), CNS. University of Wisconsin '63, B.A.; Iowa State University '70, Ph.D.

Lucia, Donald J. — 1982 — Assistant Hockey Coash (1982), STUAFF. University of Notre Dame '81, B.B.A.

Lynch, Donald F. — 1970 — Professor of Geography (1975) and Head, Department of Geography, CLA. Yale College '52, B.A.; Yale University '65, Ph.D.

MacLean, Edna A. — 1973 — Assistant Professor of Inupiaq (1979), CLA. Colorado Women's College '67, B.A.

MacLean, Jr. Stephen F. — 1971 — Professor of Zoology (1980), IAB. University of California, Santa Barbara, '64, B.A.; University of California, Berkeley '69, Ph.D.

Madonna, James A. — 1973 — Assistant Professor of Mining Extension (1977), SME. Victor Valley Junior College '69, A.S.; Humboldt State College '71, A.B.; University of Alaska '73, M.S.

Madsen, Eric C. — 1983 — Assistant Professor of Education and Field Coordinator, Cross-Cultural Education Development Program (1983), CHRD. Kalamazoo College '68, B.A.; University of Alaska-Fairbanks '79, M.A.T.; University of Oregon '83, Ph.D.

Maneval, David R. — 1981 — Professor of Mineral Beneficiation (1981), SME. Pennsylvania State University, '50, B.S.; '57, M.S.; '61, Ph.D.

Mark Anthony, Leo — 1952 — Professor of Mining Extension (1969), SME. University of Alaska '52, B.S.

Marquette, Cynthia — 1983 — Development Director, KUAC-FM-TV (1983).

Marshall, Philip S. — 1982 — Instructor of Geology, (1984), AEIDC. College of William and Mary '73, B.S.; University of Washington '77, M.S.

Mather, Keith B. — 1961 — Vice Chancellor for Research and Advanced Study (1976). Adelaide University '42, B.Sc. (Eng.); '44, M.Sc.; University of Alaska '68, (Hon.) D.Sc.

McBeath, Gerald A. — 1976 — Professor of Political Science (1982), and Head, Department of Political Science (1980), CLA. University of Chicago '63, B.A.; '64, M.A.; University of California, Berkeley '70, Ph.D.

McBeath, Jenifer H. — 1977 — Assistant Professor of Plant Pathology (1977), AFES. (1980). National Taiwan University '68, B.S.; University of California, Davis '70, M.S.; Rutgers University '74, Ph.D.

McCarthy, Paul H. — 1964 — Professor of Library Science (1977), LIB. St. John Fisher College '62, B.A.; Syracuse University '64, M.L.S.

McCarty, David W. — 1982 — Assistant Professor of Journalism and Broadcasting (1982), CLA. University of South Dakota '77, B.A.; University of Texas at Austin '83, M.A.

McConnell, Charles W. — 1981 — Program Manager, KUAC-TV (1981). American University '69, B.A.

McDiarmid, G. Williamson — 1979 — Assistant Professor of Education (1984), CHRD. University of North Carolina '69, B.A.; Harvard University '84, Ph.D.

McFadden, Terry — 1974 — Associate Professor of Mechanical and Artic Engineering (1983), SENG. Brigham Young University '60, B.E.S.M.E.; Stanford University '65, M.S.M.E.; University of Alaska '74, Ph.D., P.E.

McHenry, Susan I. — 1972 — Adviser/Counselor, Rural Student Services (1973), STUAFF. University of Alaska '70, B.A.; '76, M.Ed.

McKendrick, Jay D. — 1972 — Associate Professor of Agronomy (1972), AFES, (Palmer Research Center). University of Idaho '63, B.S.; '66, M.S.; Kansas State University '71, Ph.D.

McLaughlin, Laurel — 1976 — Assistant Director of Employee Relations (1976), VCA. Towson State College '55, B.S.; Johns Hopkins University '59, M.Ed.

McMillan, Patricia — 1980 — Science Technician III, Cultural Anthropology, (1980), AEIDC. Southern Illinois University '74, B.S.

McRoy, C. Peter — 1969 — Acting Director of International Programs (1984), Professor of Marine Science (1979), IMS. Michigan State University '63, B.S.; University of Washington '66, M.S.; University of Alaska '70, Ph.D.

McWayne, Barry J. — 1970 — Coordinator of Photography (1983), UAM.

Mellor, Morna — 1970 — Supervisor, Data Processing (1981), GI. Westchester State College '70, B.S.

Mendenhall, Perry T. — 1983 — Instructor of Education and Field Coordinator, Cross-Cultural Education Development Program (1983), CHRD. Central Bible College '68, B.A.; University of Alaska-Fairbanks '72, B.Ed.; University of Oregon '80, M.Ed.

Mendenhall, William W. — 1955 — Professor of Civil Engineering (1967), SENG. Cornell University '49, B.C.E.; '60, M.S.; P.E.; L.S.

Merritt, Robert P. — 1955 — Professor of Electrical Engineering and Geophysics (1972), SENG. Oregon State College '49, B.S.; Stanford University '68, M.S.; P.E.

Metz, Paul A. — 1975 — Assistant Professor of Geological Engineering, (1983), SME. Michigan Tech University '68, B.S.; University of Alaska '72, M.B.A.; '75, M.S.

Meyer, Paul R. — 1982 — Instructor of Hydrology, (1982), AEIDC. Dartmouth College '77, A.B.; University of New Hampshire '80, M.S.

Meyer, Stephen R. — 1981 — Assistant Professor of Military Science (1981), CLA. University of Wisconsin, Madison '65, B.S.; University of Wisconsin, Superior '77, M.A.

Michaelson, Gary J. — 1975 — Research Associate in Agronomy (1983), AFES (Palmer Research Center). University of Arizona '75, B.S.; Iowa State University '81, M.S.

Michel, Clifford, R. — 1979 — Assistant Professor of Sociology and Education, and Field Coordinator, Cross-Cultural Education Development Program (1979), CHRD. Beloit College '74, B.A.; University of Hawaii and East-West Center '76, M.A.

Mickelson, Peter G. — 1975 — Associate Professor of Wildlife Management (1981), Program Head, Wildlife and Fisheries, CNS. University of Montana '68, B.S.; University of Michigan '73, Ph.D.

Milan, Frederick A. — 1971 — Professor of Human Ecology (1971), IAB. Professor of Anthropology (1973). University of Alaska '52, B.A.; University of Wisconsin, '59, M.S.; '62, Ph.D.

Miller, John M. — 1958 — Senior Applications Engineer (1977), GI. University of Alaska '60, B.S.; '68, M.S., P.E.

Miller, L. Keith — 1960 — Associate Professor of Zoophysiology (1969), IAB. University of Nevada '55, B.S.; '57, M.S.; University of Alaska '66, Ph.D.

Million, Richard P. — 1980 — Computer Systems Manager, (1980), GI. Whitman College '61, B.A.; Columbia University '61, B.S.

Million, Wayne — 1978 — Assistant Fire Chief, University Fire Station (1978), VCA.

Mitchell, William W. — 1963 — Professor of Agronomy (1972), AFES (Palmer Research Center). University of Montana '57, B.A.; '58, M.A.; Iowa State University '62, Ph.D.

Moessner, Victoria J. — 1981 — Assistant Professor of German (1981), CLA. Indiana University, '59, A.B.; University of Michigan, '63, M.A.; '71, Ph.D.; '81, A.M.L.S.

Mohatt, Gerald V. — 1983 — Professor of Psychology; Dean, College of Human and Rural Development; and Director, Center for Cross-Cultural Studies (1983). St. Louis University '66, B.A.; '68, M.S.; Harvard University '78, Ed.D.

Moore, Dana C. — 1970 — Professor of Education (1977), CHRD. Springfield College '52, B.S.; New Mexico Highlands University 62, M.S.; U.S. International University '69, Ph.D.

Morack, John L. — 1968 — Professor of Physics (1978), CNS. Union College '61, B.S.; Oregon State University '68, Ph.D.

Morgan, John — 1976 — Professor of English (1984), CLA. Harvard University '65, A.B.; University of Iowa '67, M.F.A.

Morris, Karen J. — 1980 — Assistant Professor of Physical Education CLA, and Women's Volleyball Coach (1980). State University of New York, Brockport '65, B.S.; Ithaca College '75, M.S.

Morris, Raymond W. — 1984 — Adjunct Associate Professor of Environmental Sciences (1984), AEIDC. Lewis and Clark College '62, B.S.

Motes, Barbara J. — 1980 — Assistant Professor of Physical Education (1983), CLA and Assistant Women's Basketball Coach (1980). Adams State College '72, B.A.; '78, M.A.

Mull, Charles G. (Gil) — 1984 — Adjunct Assistant Professor of Geology (1984), CNS. University of Colorado '57, B.A.; '60, M.S.

Munro, Nancy R. — 1981 — Assistant Professor of Communication Services, (1981), AEIDC. University of California-Berkeley '73, B.A.; University of Alaska-Anchorage '83, M.B.A.

Munson, Linda Gay — 1980 — Assistant Professor of Education and Field Coordinator for the Cross-Cultural Education Development Program (1980), CHRD. University of California, Los Angeles '70, B.A.; '73, M.A.

Murphy, Edward C. — 1983 — Assistant Professor of Zoology (1983), IAB. University of California, Berkeley '70, B.A.; University of Alaska-Fairbanks '74, M.S.; University of Kansas '77, Ph.D.

Murray, David F. — 1969 — Professor of Botany (1978), and Curator, Herbarium (1970), UAM. Middlebury College '59, A.B.; University of Alaska '61, M.S.; University of Colorado '66, Ph.D.

Murray, John S. — 1967 — Associate Professor of Physics (1971) and Head, Department of Physics, CNS. Oregon State University '60, B.S.; '66, M.S.; University of Alaska '68, Ph.D.

Murray, Mayo S. — 1973 — Publications Supervisor and Information Officer (1977), AFES.

Murrell, Wm. Gregory — 1983 — Assistant Professor of Education and Field Coordinator, Cross-Cultural Education Development Program (1983), CHRD. Virginia Commonwealth University '72, B.A.; University of New Mexico '74, M.A.; '79, Ph.D.

Naidu, A. Sathy — 1969 — Associate Professor of Marine Science (1980), IMS. Andhra University '59, B.S.; '60, M.S.; '68, Ph.D.

Naske, Claus-M. — 1965 — Professor of History (1981), CLA. University of Alaska '61, A.B.; University of Michigan '64, M.A.; Washington State University '70, Ph.D.

Nava, Joseph — 1967 — Executive Officer, IAB (1975). University of Alaska '65, B.S.; '70, M.S.

Neiland, Bonita — 1961 — Director of Instruction and Public Service (1978). Professor of Land Resources (1975), and Professor of Botany (1970), SALRM. University of Oregon '49, B.S.; Oregon State College '51, M.A.; University of Wisconsin '54, Ph.D.

Nestor, Ralph W. — 1974 — Associate Professor and Head, Travel Industry Management Program (1974), SOM. Cornell University '61, B.A.; '66, B.S.; '70, M.S.

Newberry, Rainier J. — 1982 — Assistant Professor of Geology (1982), CNS. Massachusetts Institute of Technology '75, B.S. Chemistry, B.S. Geology; Stanford University, '78, M.S.; '80, Ph.D.

Nice, Philip O. — 1980 — Professor of Medical Science (1980), CNS. University of Colorado '39, A.B.; University of Colorado School of Medicine '43, M.D.

Niebauer, H. Joseph — 1976 — Associate Professor of Marine Science (1982), IMS. University of Wisconsin, Madison '67, B.S.; '76, Ph.D.

Nielsen, Hans C. S. — 1967 — Professor of Geophysics (1982), GI. Royal Technical University of Denmark '65, M.S.

Nishiyama, Tsuneo — 1975 — Associate Professor of Marine Science (1981), IMS and Fisheries. Hokkaido University '59, B.S.; '61, M.S.; '75, Ph.D.

O'Brien, J. Patrick — 1977 — Associate Professor of Economics (1980) and Head, Department of Economics, SOM. Auburn University '67, B.S.; '69, M.S.; Oklahoma State University '77, Ph.D.

Ogbe, David O. — 1984 — Assistant Professor of Petroleum Engineering (1984), SME. Louisiana State University '76, B.S.; '76, M.S.; Stanford University '83, Ph.D.

Ohtake, Takeshi — 1964 — Professor of Geophysics (1975), GI. Tohoku University '52, B.Sc.; '61, D.Sc.

Olen, M. Burton — 1980 — Professor of Accounting (1980), SOM. University of North Dakota '65, B.S.B.A.; '66, M.S.; North Dakota, '68, C.P.A.; University of Oklahoma '76, Ph.D.

Oleksa, Michael J. — 1983 — Assistant Professor of Language and Literacy (1983), CHRD and Support Coordinator, Cross-Cultural Education Development Program (1984), CHRD. Georgetown University '69, B.A.; St. Vladimir's Seminary '73, M.Th.

Olmsted, Coert D. — 1975 — Senior Programmer Analyst (1982), GI (1978). Harvard '64, B.A.

Olson, Dennis O. — 1983 — Assistant Professor of Economics (1980), SOM. St. Cloud University '75, B.A.; University of Wyoming '82, Ph.D.

Olson, John V. — 1979 — Associate Professor of Geophysics (1983), GI and Head, Space Physics and Atmospheric Sciences Program (1982). University of California, Los Angeles '62, B.A.; '63, M.S.; '70, Ph.D.

Orchard, Jayna L. — 1978 — Associate Professor of Speech and Drama (1983), CLA. University of Nevada '72, B.A.; University of California, Davis '76, M.F.A.

O'Rourke, Patrick J. — 1970 — Chancellor (1981). St. John's University '64, B.A.; Indiana State University '68, M.S.; University of Connecticut '77, Ph.D.

Orvik, James Muir — 1969 — Professor of Psychology (1983), CHRD. San Diego State College '63, B.A.; '65, M.S.; Colorago University '70, Ph.D.

Osterkamp, Joan — 1977 — Executive Officer (1980), IMS. Saint Louis University '64, B.S.; University of Alaska '77, M.B.A.

Osterkamp, Thomas — 1968 — Professor of Physics (1979), GI. Southern Illinois University '62, B.A.; Saint Louis University '64, M.S.; '68, Ph.D.

Ostermann, Russell D. — 1981 — Assistant Professor of Petroleum Engineering (1981), SME, and Head, Department of Petroleum Engineering (1983), SME. University of Kansas '74, B.S.; '80, Ph.D.

Oswood, Mark W. — 1977 — Associate Professor of Aquatic Biology (1983), IAB. Washington State University '71, B.S.; University of Montana '76, Ph.D.

Packee, Edmond C. — 1983 — Assistant Professor of Forest Management (1983), AFES. University of Montana '62, B.S.F.; Yale University '63, M.F.; University of Minnesota '76, Ph.D.

Parrett, William H. — 1979 — Associate Professor of Education (1984), CHRD. Indiana University '72, B.S.; '73, M.S.; '79, Ph.D.

Paulson, Alan C. — 1978 — Editor and Manager, Information Services, (1980), EES/IWR. University of Wisconsin '70, B.S.; University of Alaska '73, M.S.

Pearson, Roger W. — 1976 — Associate Professor of Geography (1976), CLA. Illinois State University '63, B.S.; University of Illinois '65, M.S.; '70, Ph.D.

Pennebaker, William K. — 1970 — Associate Professor of Education (1976) and Head, Department of Education (1984), CHRD. University of Kentucky '49, B.A.; '55, M.A.; Wayne State University '69, Ed.D.

Perkins, Leroy — 1983 — Assistant Professor of English (1983), CLA. University of New Mexico '68, B.A.; University of New York at Buffalo '75, Ph.D.

Peterson, John W. — 1977 — Communications Engineer, (1977), GI. Western Washington State College '67, B.A.

Peyton, Leonard J. — 1962 — Zoophysiologist and Coordinator for Environmental Services (1967), IAB. Utah State University '51, B.S.

Pfisterer, William R. — 1980 — Rural Student Teacher Coordinator, Instructor of Education (1982), CHRD. University of Wisconsin '64, B.A.; University of Alaska '80, M.A.

Philip, Betty Anne P. — 1965 — Associate Professor of Medical Science, (1972), CNS. Agnes Scott College '52, B.A.; Yale University '54, M.S.; '60, Ph.D.

Philip, Kenelm W. — 1965 — Research Associate in Taxonomy (1975), IAB. Yale University '53, B.S.; '58, M.S.; '63, Ph.D.

Phillips, William G. — 1975 — Vice Chancellor for Academic Affairs (1983), Professor of Business Administration (1975). Waynesburg College '52, B.S.; American Graduate School of International Management '58, B.F.T.; University of Nebraska '67, M.A.; '70, Ph.D.

Philo, Lee M. — Research Veterinarian, U.S. Army (1975). Wilkes College '68, A.B.; University of Pennsylvania School of Veterinary Medicine '72, V.M.D.

Piacenza, Robert J. — 1977 — Associate Professor of Mathematics (1983), CLA. University of Florida '67, B.S.; University of Miami '73, M.S.; '76, Ph.D.

Ping, Chien Lu — 1982 — Assistant Professor of Agronomy (1983), AFES. Chung Hsin University, Taiwan '65, B.Sc.; Washington State University '72, M.S.; '76, Ph.D.

Possenti, Richard G. — 1966 — Associate Professor of Psychology (1973), CHRD. St. Joseph College '51, B.S.; University of Alabama '55, M.A.

Powers, W. Roger — 1971 — Associate Professor of Anthropology (1976), CLA. Idaho State University '64, B.A.; University of Wisconsin '68, M.S.; '73, Ph.D.

Proctor, Charles — 1980 — Professor of Engineering and Science Management (1980), SENG. Oklahoma State University '51, B.S.; Purdue University '55, M.S.; Oklahoma State University '63, Ph.D.

Pulpan, Hans — 1968 — Associate Professor of Geophysics (1980), GI. Montainistische Hochschule Loeben, Austria '61, Dipl. Eng.; University of Illinois '64, M.S.; '68, Ph.D.

Raines, M. Diane — 1982 — Assistant Professor of Library Science (1982), LIB. Walsh College '73, B.A.; Kent State University '75, M.A.

Rao, Nagabhushana M.S. — 1970 — Professor of Sociology (1981) and Head, Department of Behaviorial Sciences and Human Services (1982), CHRD. Chairman, Asian Studies (1974). University of Mysore '57, B.A. (Hon.); '58, M.A.; Washington State University '74, Ph.D.

Rao, Pemmasani Dharma — 1966 — Professor of Coal Technology (1976), MIRL. Andhra University '52, B.Sc.; '54, M.Sc.; Pennsylvania State University '59, M.S.; '61, Ph.D.

Raugust, Richard — 1976 — Affiliate Assistant Professor of Medical Science (1977), CNS. Washington State University '63, B.S.; University of Washington '67, M.D.

Ray, Charles K. — 1957 — Director of Summer Sessions (1982) and Professor of Education (1960). University of Colorado '51, B.A.; Columbia University '55, M.A.; '59, Ed.D.

Raymond, James A. — 1980 — Affiliate Assistant Professor of Marine Science (1980), IMS. University of Pennsylvania '68, B.A.; University of California, San Diego '71, M.S.; '76, Ph.D.

Reeburgh, William S. — 1968 — Professor of Marine Science (1977), IMS, and Director of Graduate Studies (1983). University of Oklahoma '61, B.S.; Johns Hopkins University '64, M.A.; '67, Ph.D.

Reed, Eugene E. — 1970 — Assistant to the Dean, (1971), CLA. Purdue University '67, B.A.; '70, M.A.

Rees, Manfred H. — 1958 — Professor of Geophysics (1975), GI. West Virginia University '48, B.S.E.E.; University of Colorado '56, M.S.; '58, Ph.D.

Reger, Richard D. — 1975 — Adjunct Associate Professor of Geology (1984), CNS. University of Alaska-Fairbanks '63, B.A.; '64, M.S.; Arizona State University '75, Ph.D.

Reichardt, Paul B. — 1972 — Professor of Chemistry (1981), CNS. Davidson College '65, B.S.; University of Wisconsin '69, Ph.D.

Reisinger, John W. — 1972 — Chief Engineer, KUAC-FM-TV (1980).

Rensenbrink, Willy E. — 1969 — Executive Officer, (1972), AEIDC.

Restad, Sigmund H. — 1958 — Acting Director, Agricultural and Forestry Experiment Station (1985), Assistant Director (1978), AFES (Palmer Research Center). University of Minnesota '53, B.S.; '54, M.S.

Rey, Louis — 1983 — Distinguished Visiting Professor of Arctic Science and History (1983). Sciences Experimentales '48, Baccalaureat A; Ecole Normale Superieure '50; Sorbonne, Paris '52, M.A.; Diplome d'Etudes superieures '53; Concours National d'Agregation '54; Sorbonne, Paris '58, Ph.D.

Reynolds, James B. — 1978 — Associate Professor of Fisheries and Unit Leader, Alaska Cooperative Fishery Research Unit (1978), IAB. Utah State University '61, B.S.; Iowa State University '63, M.S.; '66, Ph.D.

Rhett, Victor E. — 1980 — Pub Manager (1982), STUAFF. University of Alaska-Faribanks '83, B.B.A.

Rice, Michael L. — 1983 — Dean, School of Management (1983) and Professor of Business Administration (1983), SOM. Florida State University, Tallahassee '71, B.S.; '72, M.B.A.; University of North Carolina, Chapel Hill '75, Ph.D.

Richmond, Allen P. — 1980 — Research Associate, SALRM (1980). Virginia Polytechnic Institute and State University '72, B.S.

Rider, C. Douglas — 1979 — Associate Professor of Education (1979), CHRD. California State College, Long Beach '69, B.A.; University of Oregon '74, Ph.D.

Riedl, Richard E. — 1981 — Assistant Professor of Education (1975), CHRD. Cornell College '67, B.A.; University of Akron '70, M.A.; Arizona State University '75, Ph.D.

Riley, Joe — 1984 — Producer/Reporter, KUAC-TV (1984). Furman University '78, B.A.

Risch, Kenneth W. — 1984 — Assistant Professor of Theater (1984), CLA. University of Wisconsin '72, B.S.; University of Minnesota '79, M.F.A.

Roberts, Thomas D. — 1966 — Professor of Physics and Electrical Engineering (1974). Director, Engineering Experiment Station/Institute of Water Resources (1983). University of Alabama '59, B.S.; Oregon State University '65, Ph.D., P.E.

Robillard, Eugene — 1983 — Associate Professor of Business Administration (1983), SOM. Boston College '56, B.S.B.A.; North Texas State University '67, M.B.A.; University of Oklahoma '72, Ph.D.

Robinson, E. Thomas — 1974 — Associate Professor of Accounting (1979), SOM. University of Wisconsin '67, B.B.A.; '71, M.S.; C.P.A.; '82, C.M.A.

Roderick, George T. — 1978 — Assistant Professor of Physical Education (1980), CLA, Assistant Men's Basketball Coach, Coordinator of Intramural Sports. Kilgore Jr. College '65, A.A.; University of Denver '67, B.A.; '69, M.A.

Roederer, Juan G. — 1977 — Professor of Physics and Director of the Geophysical Institute (1977). University of Buenos Aires '52, Ph.D.

Roth, Mitchell — 1983 — Associate Professor of Computer Science (1983), CLA. Michigan State University '73, M.S.; University of Illinois '80, Ph.D.

Roth, Stephen E. — 1971 — Coordinator, Academic Support Services and Foreign Student Adviser, (1977), STUAFF. University of Alaska '73, B.A.; University of Vermont '75, M.A.; University of Alaska '77, M.Ed.; Oregon State University '83, Ph.D.

Roussain-Nice, Cheryl — 1980 — Adjunct Instructor of Medical Science (1980), CNS. University of Toronto '68, R.N.; University of Washington '77, P.A.C; New England University '79, B.A.

Royer, Susan B. — 1970 — Assistant Professor of Mathematics (1975), CLA. Salem State College '61, B.S.; Texas A&M University '66, M.S.; '69, M.S.

Royer, Thomas C. — 1969 — Professor of Marine Science (1981), IMS. Albion College '63, B.A.; Texas A&M University '66, M.S.; '69, Ph.D.

Rukas, Nijole M. — 1980 — Assistant Professor of Spanish (1982), CLA. Rockford College, B.A. '59; Tufts University, M.A. '61; University of Arizona, Ph.D. '81.

Sackinger, William M. — 1970 — Associate Professor of Geophysics and Electrical Engineering (1971), GI. University of Notre Dame '59, B.S.; Cornell University '61, M.S.; '69, Ph.D., P.E.

Sager, Rochelle — 1975 — Assistant Professor of Library Science (1975), LIB. University of Illinois, Urbana '66, B.A.; '69, M.S.L.S.; Loyola University '75, M.Ed.

Salisbury, Lee H. — 1955 — Professor of Speech and Theatre Arts (1967), CLA. New York University '49, B.S.; Columbia University '50, M.A.

Sanders, Robert H. — 1981 — Affiliate Associate Professor of Palynology (1981), SME. University of Alaska '42, B.S.

San Nicolas, Sharon J. — 1982 — Teacher Placement Coordinator (1982), STUAFF. San Diego State University '65, B.A.

Schafer, Lary A. — 1970 — Instructor of Cross-Cultural Education and Rural Development (1984), CHRD. University of Alaska '68, B.A.; University of Arizona '70, M.A.; '74, M.Ed.

Schafer, Richard A. — 1980 — Instructor of Physical Education (1980), CLA. University of Notre Dame '74, B.A.; '80, M.S.

Schamel, Douglas — 1975 — Instructor of Biology (1980), CNS. Allegheny College '71, B.S.; University of Alaska-Fairbanks '74, M.S.

Schell, Donald M. — 1976 — Associate Professor of Water Resources and Marine Science (1983), EES/IWR and IMS. Southeastern Massachusetts University '62, B.S.; University of Alaska '64, M.S.; '71, Ph.D.

Schneider, James O. — 1970 — Program Assistant, KUAC-FM (1980).

Schneider, William S. — 1980 — Assistant Professor of Library Science (1980), LIB. Franklin and Marshall College '68, B.A.; Bryn Mawr College '72, M.A.; '76, Ph.D.

Schuldiner, Michael — 1980 — Associate Professor of English (1984), CLA. Goddard College '69, B.A.; Kent State '79, Ph.D.

Schwendig, Lee — 1984 — Associate Professor of Business Administration (1984), SOM. Idaho State University '67, B.S.; University of Wyoming '68, M.S.; University of Nebraska '79, Ph.D.

Scorup, Peter C. — 1972 — Research Associate (1980). AFES (Palmer Research Center). Colorado State University '66, B.S.

Scott, G. Richard — 1973 — Associate Professor of Anthropology (1978), CLA. Arizona State University, Tempe '68, B.A.; '73, Ph.D.

Seifert, Richard D. — 1973 — Assistant Professor and Energy Specialist (1981) Cooperative Extension Service and EES/IWR. Westchester State College '70, B.A.; University of Alaska '73, M.S.

Sengupta, Mritunjoy — 1983 — Associate Professor of Mining Engineering (1983), SME. Indian School of Mines '64, B.S.; Columbia University '71, M.S.; '73, M.S.; Colorado School of Mines '82, Ph.D.

Senungetuk, Ronald W. — 1961 — Director, Native Arts Center (1965), CLA, and Head, Department of Art. School for American Craftsmen. Rochester Institute of Technology '60, A.A.S. and B.F.A.; Statens Handvaerks og Kunstindustriskole, Oslo, Norway '61, Diploma.

Shapiro, Lewis H. — 1971 — Associate Professor of Geology (1979), GI. South Dakota School of Mines and Technology '62, B.S.; University of Minnesota '71, Ph.D.

Sharma, Ghanshyam D. — 1963 — Director, Petroleum Development Laboratory (1984); Professor of Petroleum Engineering (1984); Professor of Marine Science (1969), Alaska Sea Grant Program and Professor of Petroleum Geology (1981), SME. Benares Hindu University '52, B.S.; Swiss Federal Institute of Technology '58, Diploma of Engineering Geology; University of Michigan '61, Ph.D.

Shaw, David G. — 1973 — Professor of Marine Science (1982), IMS. University of California, Los Angeles '67, B.S.; Harvard University '69, A.M.; '71, Ph.D.

Shaw, Glenn E. — 1971 — Professor of Geophysics (1981), GI. Montana State University '63, B.S.; University of Southern California '65, M.S.; University of Arizona '71, Ph.D.

Shechter, William T. — 1970 — Fire Chief, University Fire Station (1978), VCA.

Shelton, Harris W. — 1971 — Dean of Students (1974), and Associate Professor of Education (1971), STUAFF. University of South Florida '65, B.A.; '67, M.A.; Florida State University '71, Ph.D.

Sheridan, J. Roger — 1964 — Professor of Physics (1971), CNS. Reed College '55, B.A.; University of Washington '64, Ph.D.

Shieh, Yeung-Nan — 1984 — Assistant Professor of Economics (1984), SOM. National Taiwan University-Taipei '66, B.A.; University of Rochester, New York '76, M.A.; Texas A&M University '80, Ph.D.

Shields, Gerald F. — 1975 — Associate Professor of Zoology (1975), IAB. Carroll College '66, B.A.; Central Washington State College '70, M.S.; University of Toronto '74, Ph.D.

Shinkwin, Anne D. — 1971 — Head, Department of Anthropology (1984) and Associate Professor of Anthropology (1977) and Alaska Native Studies (1983), CLA. University of Connecticut '60, B.A.; George Washington University '64, M.A.; University of Wisconsin '75, Ph.D.

Siegrist, Richard D. — 1958 — Head, External Technical Services and Special Projects, GI. (1976). Fullerton College '52, B.S.

Simpson, Glen C. — 1969 — Associate Professor of Art (1976), CLA. Rochester Institute of Technology '68, B.F.A.; '69, M.F.A.

Sims, John F. M. — 1977 — Affiliate Associate Professor, of Geological Engineering (1984), SME. Durham University '56, B.S.; University of Witwatersrand '69, Ph.D.

Singer, Jack — 1982 — Adviser/Counselor, Rural Student Services (1983), STUAFF. Rutgers University '78, B.S.

Sink, Cathy R. — 1980 — Staff Counselor, Center for Health and Counseling, STUAFF, and Assistant Professor of Psychology (1980), CHRD. University of California, Los Angeles '74, B.A.; Fuller Graduate School of Psychology '77, M.A.; '79, Ph.D. Licensed Psychologist '82.

Sinz, Jeanne M. — 1980 — Placement Coordinator (1980), STUAFF. University of Wisconsin-Eau Clair '76, B.A.; University of Wisconsin-Stout '78, M.S.

Sivjee, Gulamabas G. — 1972 — Professor of Geophysics (1981), GI. University of London '63, B.S.; Johns Hopkins University '70, Ph.D.

Skudrzyk, Frank J. — 1982 — Professor of Mining Engineering (1982) and Head, Department of Mining and Geological Engineering (1983), SME. University of Mining and Metallurgy, Cracov '68, B.Sc., M.Sc.; '73, Ph.D.

Slaughter, Charles W. — 1970 — Affiliate Professor of Water Resources (1976), EES/IWR. Washington State University '62, B.S.; Colorado State University '68, Ph.D.

Smith, David D. — 1980 — Assistant Professor of Speech Communications (1980), CLA. California State Polytechnic University '71, B.S.; California State University '72, M.A.; Wayne State University '75, Ph.D.

Smith, David M. — 1985 — Visiting Associate Professor of Research in Literacy (1985), CHRD. Nyack College '56, B.S.; Hartford Seminary Foundation '65, M.A.; Michigan State University '69, Ph.D.

Smith, Roger W. — 1984 — Associate Professor of Physics (1984), GI. University of Exeter '63, B.S.; '67, Ph.D.

Smith, Ronald L. — 1968 — Professor of Zoology (1984), CNS. Occidental College '64, B.A.; University of Miami '67, M.S.; '68, Ph.D.

Smith, Thomas E. — 1973 — Adjunct Professor of Mining Geology (1984), CNS. Stanford University '65, M.S.; University of Nevada '71, Ph.D.

Smith, William H. — 1964 — Associate Professor of Library Science (1969), LIB. Iowa State College '58, B.S.; Simmons College '60, M.S.I.S.

Smith, William Leonard — 1967 — Assistant Professor of Physical Education (1967), CLA. Western State College '54, B.A.; '58, M.A.

Socher, Charles F. — 1979 — Assistant Professor of Economics (1979), SOM. Xavier University '74, A.B.; West Virginia University '76, M.A.; '79, Ph.D.

Solie, Richard J. — 1970 — Professor of Economics (1970), SOM. Wisconsin State University '55, B.S.; University of Tennessee '65, Ph.D.

Sokolov, Barbara J. — 1977 — Assistant Professor, Supervisor Information Services, (1981), AEIDC. University of Washington '57, B.A.; Rosary College '73, M.L.S.; University of Connecticut '77, M.B.A.

Sparrow, Stephen D. — 1981 — Assistant Professor of Agronomy (1981), AFES. North Carolina State University '69, B.S.; Colorado State University '73, M.S.; University of Minnesota '81, Ph.D.

Speck, Robert C. — 1984 — Associate Professor of Geological Engineering (1984), SME. University of Missouri-Rolla '74, B.S.; '75, M.S.; '79, Ph.D.

Spell, B. David — 1978 — Visiting Assistant Professor of Electrical Engineering (1980), Affiliate Research Engineer (1979), GI. University of Washington '74, B.S.E.E.; 81, M.S.E.E.; P.E.

Spencer, David L. — 1976 — Associate Professor of Wildlife Biology (1976), AEIDC. Pennsylvania State University '37, B.S.; University of Michigan '40, M.S.

Spooner, Marlene W. — 1956 — Assistant Director of Admissions and Records (1974), VCAA. University of Alaska '74, B.A.

Stark, David A. — 1971 — Associate Professor of English (1980), CLA. University of California, Los Angeles '65, B.A.; University of California, Irvine '69, M.F.A.

Stech, David A. — 1972 — Associate Professor of Music (1982) and Head, Department of Music, CLA. University of Minnesota '67, B.S.; Ohio State University '69, M.A.; Michigan State University '76, Ph.D.

Stenard, Richard A. — 1976 — Associate Dean of Students (1982), STUAFF, and Assistant Professor of Education (1976). State University of New York, Albany '65, B.S.; '66, M.S.; Florida State University '75, Ph.D.

Stephens, Dennis J. — 1978 — Associate Professor of Library Science (1984), LIB. Portland State University '69, B.A.; University of Denver '75, M.A.

Stier, Marc W. — 1982 — Assistant Professor of Political Science (1982), CLA. Wesleyan University '76, B.A.; Harvard University '82, A.B.D.

Stilkey, Neta J. — 1966 — Business Manager, (1973), GI.

Stinson, Lillian Powers — 1972 — Associate Professor of Education (1974), CHRD. University of Illinois '58, B.S.; '64, M.Ed.; '70, Ed.D.

Stockholm, Kendall R. — 1974 — Assistant Professor and Director, Justice Program (1974), CLA. Lamar University '71, B.S.; Sam Houston State University '72, M.A.; '84, Ph.D.

Stolzberg, Richard J. — 1978 — Associate Professor of Chemistry (1982), CNS. Tufts University '69, B.S.; Massachusetts Institute of Technology '73, Ph.D.

Stone, David B. — 1966 — Professor of Geophysics (1977) and Assistant Director of GI (1984). University of Keele '56, B.A.; University of Newcastle Upon Tyne '63, Ph.D.

Stratton, Marcia — 1980 — Instructor of Speech Communications (1980), CLA. Wilkes College '78, B.S.; University of North Carolina '79, M.Ed.

Stratton, Russel E. — 1983 — Associate Professor of English (1983), CLA. Princeton University '60, A.B.; University of Southern Mississippi '76, M.A.; '79, Ph.D.

Stricks, James L. — 1972 — Coordinator, Resource Center, CHRD. (1982). Cornell University '71, B.A.; University of Alaska '74, M.A.T.

Stringer, William J. — 1965 — Associate Professor of Geophysics (1982), GI. New Mexico State University '62, B.S.; University of Alaska '71, Ph.D.

Strohmaier, Judith A. — 1970 — Director, Conferences and Institutes (1978), and Assistant Professor (1975). University of Wisconsin '57, B.A.; University of Alaska '75, M.A.

Sullivan, Robert A. — 1964 — Assistant Professor of Mathematics (1967), CLA. St. Bonaventure University '52, B.S.; '61, M.S.; University of Illinois '69, M.A.

Summerville, Suzanne — 1978 — Associate Professor of Music (1978), CLA. Randolph-Macon Woman's College '58, A.B.; Vienna Academy of Music '61, Diploma; University of Houston '68, M.M.; Freie Universitat Berlin '77, Dr. phil.

Survant, Lori A. — 1982 — Program Coordinator, Wood Center (1984), STUAFF. Saginaw Valley State College '80, B.A.; Bowling Green State University '84, M.A.

Svenningson, Allen R. — 1967 — Associate Professor of Physical Education (1967), CLA. Winona State College '58, B.S.; Colorado State College '61, M.S.

Swanson, Samuel E. — 1979 — Associate Professor of Geology (1983), CNS. University of California, Davis '68, B.S.; '70, M.S.; Stanford University '74, Ph.D.

Swartz, L. Gerard — 1958 — Professor of Zoology (1968), CNS. University of Illinois '53, B.S.; '54, M.S.; '58, Ph.D.

Swift, Daniel W. — 1963 — Professor of Geophysics (1972), and Assistant Director of GI. (1984). Haverford College '57, B.A.; Massachusetts Institute of Technology '59, M.S.

Tabbert, Russell — 1972 — Associate Professor of English (1975), CLA. University of Iowa '63, B.A.; '69, Ph.D.

Taylor, John N. — 1982 — Associate Professor of Business Administration (1982), SOM, and a joint appointment with Alaska Native Studies (1983), CLA. U.S. Military Academy '60, B.S.; Air Force Institute of Technology '69, M.S.; George Washington University '75, D.B.A.; University of Utah '76, Post Doctoral

Taylor, Paul C. — 1980 — Associate Professor of Finance (1980), SOM. University of Kansas, '70, B.S.; '73, M.A.; '75, Ph.D.

Taylor, Roscoe L. — 1984 — Professor of Agronomy (1984), AFES (Palmer Research Center). South Dakota State University '48, B.S.; Iowa State University '51, M.S.

Taylor, Sally R. — 1966 — Admissions Counselor (1976), VCAA. Marshall University '59, B.A.; California State College at Long Beach '63, M.A.

Thiele, James G. — 1980 — Instructor of Fisheries Biology, (1980) AEIDC. University of Colorado '72, B.S.

Thomas, Dana L. — 1981 — Assistant Professor of Statistics (1981), CLA. University of Alaska '74, B.S.; Oregon State University '78, M.S.; '82, Ph.D.

Thomas, Kay L. — 1984 — Adviser/Counselor, Rural Student Services (1984), STUAFF. University of Alaska-Fairbanks '83, B.S.

Thomas, Monica E. — 1971 — Assistant Professor of Economics (1977), SOM. Miami University '63, A.B.; Washington State University '70, M.A.

Thomas, Wayne C. — 1971 — Acting Dean, School of Agriculture and Land Resources Management (1985), Professor of Economics (1982), AFES. California State Polytechnic College '65, B.S.; University of Nevada '67, M.S.; Washington State University '71, Ph.D.

Thompson, Eldon — 1964 — Electrical Engineer (1975), GI. University of Alaska '64, B.S.E.E.

Thompson, Steven K. — 1984 — Assistant Professor of Statistics (1984), CLA. University of California '70, A.B.; Oregon State University '76, M.S.; '82, Ph.D.

Tiedemann, James B. — 1966 — Professor of Mechanical Engineering (1966), SENG. University of Wisconsin '45, B.S.; '49, M.S.; '55, Ph.D.; P.E.

Tilsworth, Timothy — 1970 — Professor of Environmental Quality Engineering and Civil Engineering (1984), SENG. University of Nebraska '66, B.S.C.E.; '67, M.S.C.E.; University of Kansas '70, Ph.D.

Tomczak, Theresa Helen — 1966 — Associate Professor of Physical Education (1972) and Head, Department of Physical Education, CLA. State University College of New York '61, B.S.; Syracuse University '66, M.S.

Tonella, Karla D. — 1982 — Producer, KUAC-FM (1982).

Tremarello, Ann — 1957 — Director of Admissions and Records (1974), VCAA. University of Alaska '57, B.B.A.

Triplehorn, Don M. — 1969 — Professor of Geology (1977) and Head, Department of Geology and Geophysics (1984), CNS. Ohio Wesleyan University '56, B.A.; Indiana University '57, M.A.; University of Illinois '61, Ph.D.

Triplehorn, Julia H. — 1979 — Assistant Professor of Library Science (1979), GI library. Ohio Wesleyan University '57, B.A.; University of Illinois '60, M.S.L.S.

Trojan, Jerome L. — 1983 — Vice Chancellor for Administration (1983). Western Michigan University '65, B.B.A.; Central Michigan University '72, M.B.A.

Trudgen, David E. — 1977 — Instructor of Wildlife Biology (1978), AEIDC. Michigan State University '76, B.S.

Turner, A. John L. — 1966 — Professor of Education (1970), CHRD. McMurry College '51, B.S.; North Texas State University '55, M.Ed.; New Mexico State University '66, Ed.S.

Turner, Donald L. — 1970 — Professor of Geology (1979), GI. University of California, Berkeley '60, A.B.; '68, Ph.D.

Van Cleve, Keith — 1967 — Professor of Forestry (Soils) 1976), SALRM. University of Washington '58, B.S.; University of California, Berkeley '60, M.S.; '67, Ph.D.

Van Hecke, C. Parker — 1982 — Radio Station Manager/Program Director, KUAC-FM (1982). Eastern New Mexico University '71, B.S. University of Kansas '75, M.A.

Van Rhyn, Mark E. — 1981 — Housing Officer (1984). University of California-Irvine '71, B.A.; University of Alaska-Fairbanks '82, M.E.D.

Van Veldhuizen, Philip A. — 1963 — Professor of Mathematics (1974), CLA. Central College '52, B.A.; State University of Iowa '60, M.S.

Venkatesh, Eswarahalli S. — 1983 — Assistant Professor of Mechanical and Petroleum Engineering (1983), SME. Bangalore University, India '69, B.Sc.; '71, B.E.; Brown University '73, M.S.; New Mexico Institute of Mining and Technology '77, Ph.D.; University of Oklahoma '80, M.S.

Vicente, Susan F. — 1974 — University Nurse Practitioner (1983), STUAFF. Ft. Lewis College '69, B.S.; Miami Valley Hospital School of Nursing '71, Diploma. Advanced Nurse Practitioner, '81.

VonHolle, James R. — 1984 — Assistant Professor of Military Science (1984), CLA. University of Dayton, Ohio '76, B.S.; University of Alaska '84. M.B.A.

Voos, Kenneth A. — 1982 — Adjunct Assistant Professor of Environmental Engineering, AEIDC (1984). Rutgers University '73, B.S.; Uath State University '78, M.S.; '81, Ph.D.

Walker, Cynthia L. — 1977 — Associate Professor of English (1982), CLA. Denison University '70, B.A.; Purdue University '72, M.A.; '74, Ph.D.

Walsh, Daniel E. — 1982 — Instructor of Mineral Processing (1984), SME. University of Alaska '81, B.S.; '84, M.S.

Walstad, David L. — 1969 — Director of Engineering, KUAC-FM-TV (1980).

Watkins, Brenton J. — 1980 — Assistant Professor of Geophysics (1980), GI. University of Adelaide '68, B.S.; La Trobe University '72, M.S.; University of Alaska '74, Ph.D.

Weaver, Gerald — 1979 — Associate Professor of Broadcasting and Journalism (1983), CLA. University of the Pacific '60, B.A.; University of Mississippi '77, M.A.

Weeden, Robert B. — 1967 — Professor of Resource Management (1976), SALRM. University of Massachusetts '53, B.S.; University of Maine '55, M.S.; University of British Columbia '59, Ph.D.

Weller, Gunter E. — 1968 — Professor of Geophysics (1973) and Deputy Director of the GI. (1984). University of Melbourne '62, B.S.; '64, M.S.; '67, Ph.D.

Wells, Tom — 1984 — Assistant Professor of Exercise Physiology (1984), CLA. University of Minnesota '71, B.S.; Indiana University '73, M.S.; '81, P.E.D.

Wendler, Gerd — 1966 — Professor of Geophysics (1982), GI. University of Innsbruck '64, D. Phil.

Wentink, Tunis, Jr. — 1970 — Professor of Physics (1970), GI. Rutgers University '41, B.S.; Cornell University '54, Ph.D.

Wescott, Eugene — 1958 — Professor of Geophysics (1974). GI. University of California, Los Angeles '55, B.A.; University of Alaska '60, M.S.; '64, Ph.D.

West, C. Eugene — 1977 — Assistant Professor of Library Science (1982), LIB. Dickinson State College '60, B.S.; University of Denver '70, M.S.; University of Alaska '78, M.A.

West, Sharon M. — 1973 — Associate Professor of Library Science (1981), LIB. University of Southern Colorado '69, B.S.; University of Denver '70, M.A.

White, Robert Gordon — 1970 — Professor of Zoophysiology and Nutrition (1981), IAB. University of Melbourne '62, B.Agr.S.; University of New England '68, M.Rur.S.; '73, Ph.D.

Whitehead, John S. — 1978 — Professor of History (1984), CLA. Yale '67, B.A.; '69, M.A.; '71, Ph.D.; University of Cambridge '72, M.A.

Williams, Nancy A. — 1982 — Assistant Professor of Economics (1982), SOM. University of California, Riverside '76, B.S.; University of California Berkeley '81, M.A.; '84, Ph.D.

Williams, Robert C. — 1977 — Instructor (1979), IMS. University of Alaska '75, B.S.; University of Denver '77, M.S.L.S.

Wilm, Helga — 1968 — Assistant to the director (1978), GI.

Wilson, Charles R. — 1951 — Professor of Physics (1971), GI. Case Institute of Technology '51, B.S.; University of New Mexico '56, M.S.; University of Alaska '63, Ph.D.

Wilson, William J. — 1974 — Assistant Professor, Supervisor, Resource and Science Services (1978), AEIDC. Gonzaga University '69, B.S.; Oregon State University '73, M.S.

Wiltse, Milton A. — 1979 — Adjunct Associate Professor of Geology (1984), CNS. University of Pennsylvania '64, B.S.; Indiana University '66, M.S.; '68, Ph.D.

Winford, George M. — 1976 — Associate Professor of Journalism (1979) and Head, Department of Journalism and Broadcasting, CLA. Louisiana State University '64, B.A.; '76, M.J.

Wise, James L. — 1975 — Assistant Professor of Climatology (1976), AEIDC. Kent State University '53, B.S.; Florida State University '68, M.S.

Wolf, Aron S. — 1975 — Adjunct Associate Professor of Medical Science (1976), CNS. Dartmouth College '59, B.A.; University of Maryland Medical School '63, M.D.

Woo, Kin-Chu — 1981 — Assistant Professor of Electrical Engineering (1981), SENG. Massachusetts Institute of Technology '75, B.S.; University of Texas at Austin '78, M.A.; Texas A & M University '82, Ph.D.

Wooding, Frank — 1970 — Professor of Agronomy (1982), AFES. University of Illinois '63, B.S.; Kansas State University '66, M.S.; '69, Ph.D.

Woodward, Kesler — 1982 — Assistant Professor of Art (1981), CLA. Davidson College '73, B.A.; Idaho State University '77, M.F.A.

Workman, William G. — 1973 — Associate Professor of Economics (1979), SOM. University of Wyoming '69, B.S.; Utah State University '72, M.A. '73, Ph.D.

Wreggit, John D. — 1976 — Adjunct Associate Professor of Medical Science (1976), CNS. University of Michigan Medical School '64, M.D.

Wright, Gordon Brooks — 1969 — Professor of Music (1974), CLA. College of Wooster '57, B.M.; University of Wisconsin '61, M.A.

Yarie, John A. — 1978 — Visiting Assistant Professor of Silviculture and Forest Soils (1983), AFES. Forest Soils Laboratory (1978). West Virginia University '71, B.S.; University of Maine '74, M.S.; University of British Columbia '78, Ph.D.

Young, Merle B. — 1980 — Athletic Trainer (1980). Montana State University '63, B.S.; Mayo Clinic, School of Physical Therapy '65, Certified Physical Therapist.

Youtcheff, Jr. John S. — 1983 — Assistant Professor of Coal Science and Technology (1983), SME. Pennsylvania State University, '77, B.S., '83, Ph.D.

Zach, Howard L. — 1970 — Associate Professor of Business Administration (1974), SOM. Colorado State University '64, B.S.; '66, M.S.

Zarling, John P. — 1976 — Head, Department of Mechanical Engineering and Professor of Mechanical Engineering (1981), SENG. Michigan Technological University '64, B.S.M.E.; '66 M.S.E.M.; '71 Ph.D.E.M., P.E.

Zecchini, Sandra — 1983 — Assistant Professor of Education and Field Coordinator for the Cross-Cultural Education Development Program, (1983), CHRD. Union College '78, M.A.; University of Tennessee '83, Ph.D.

Zielinski, L. Stanley — 1966 — Professor of Art (1974), CLA. Alfred University '55, B.F.A.; '62, M.F.A.

Zuelsdorf, Catherine — 1979 — Assistant Professor of Art (1979), CLA. Stephens College '77, B.F.A.; Columbia University '79, M.F.A.

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CREDITS

Designed and edited by the UAF Public Affairs Office

Photographs

All black and white photographs are by UAF public affairs photographer Samuel Winch, except page 35 which is by Mark Robinson and page 202 by Kurt Savikko.

Cover

Front: Marathon runners Bob Murphy (in front) and Stan Justice in the 1984 Equinox Marathon. Justice broke the previous record when he won. Murphy came in second. Photo by Samuel Winch.

Back: Sunset over the Goldstream Valley a few miles north of Fairbanks. Photo by Samuel Winch.