University of Alaska-Fairbanks

1985-86 Catalog

1987-88 Catalog

University of Alaska-Fairbanks

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.

It is the policy of the University of Alaska to provide equal education and employment opportunities and to provide services and benefits to all students and employees without regard to race, color, religion, national origin, sex, age, disability or status as a Vietnam era or disabled veteran. This policy is in accordance with the laws enforced by the Department of Education and the Department of Labor, including Presidential Executive Order 11246, as amended, Title VI and Title VII of the 1964 Civil Rights Act, Title IX of the Education Amendments of 1972, the Public Health Service Act of 1971, the Veteran's Readjustment Assistance Act of 1974, the Vocational Rehabilitation Act of 1973, the Age Discrimination in Employment Act of 1967, the Equal Pay Act of 1963, the 14th Amendment, EEOC's Sex Discrimination Guidelines, and Alaska Statutes 18.80.220 and 14.18. Inquiries regarding application of these and other regulations should be directed either to the Title IX Coordinator/Section 504 Coordinator, 101 Eielson, University of Alaska-Fairbanks, Fairbanks, Alaska 99775-5320, phone (907) 474-7919 OR Cathy Sink, Counselor/Coordinator of Disabled Student Services, Center for Health & Counseling, University of Alaska-Fairbanks, Fairbanks, Alaska 99775-0440, (907) 474-7043; the Office of Civil Rights, Department of Education, Washington, DC; or to the Office of Federal Contract Compliance Programs, Department of Labor, Washington, DC.

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.

Sculptor Bernard Hosey completed the installation of his sculpture "Totem" on the West Ridge of campus in front of the University of Alaska Museum.

Contents and Information Sources

Sources of Information
University of Alaska-Fairbanks

Admissions and Records	(907) 474-7521 or (907) 474-7821
Alaska Teacher Placement	474-6644
Alumni Association	474-7081
Career Planning and Placement	474-7596
Chancellor	474-7112
Conferences and Continuing Education	474-7800
Cooperative Extension Service	474-7246
Coordinator of Disabled Student Services	474-7043
Correspondence Study	474-7222
Fairbanks Assembly	474-7964
Fees	474-7551
Financial Aid	474-7256
Foreign Students International Student Adviser	474-7317
General Information University Relations	474-7581
Graduate Study	474-7464
Honors Program	474-6612
Housing	474-7247
International Programs	474-5329
Mining Extension School of Mineral Engineering	474-7366
Rural Student Services	474-7872
Student Activities	474-7037
Student Advising	474-7317
Student Affairs	474-7317
Summer Sessions	474-7021
University Relations	474-7581
Women's Center	474-6330

The address for all departments is:
University of Alaska-Fairbanks
Fairbanks, Alaska 99775

Academic Calendar

1987 Summer Sessions

First Six-Week Session

Registration ..... Mon., June 1
First day of classes ..... Mon., June 1
Last day of classes ..... Fri., July 10

12-Week Session

Registration ..... Mon., June 1
First day of classes ..... Mon., June 1
Last day of classes ..... Fri., Aug. 21

Three-Week Session

Registration ..... Mon., June 8
First day of classes ..... Mon., June 8
Last day of classes ..... Fri., June 26

Second Six-Week Session

Registration ..... Mon., July 13
First day of classes ..... Mon., July 13
Last day of classes ..... Fri., Aug 21

1987 Fall Semester

Early Orientation for
New Students (EONS) ..... Sun.-Tues., Aug. 30-Sept. 2
Registration materials and advisers available ..... Mon., Aug. 31
Registration: course selection ..... Tues., Sept. 1
Registration: fee payment ..... Wed.-Fri., Sept. 2-4
First day of instruction ..... Thurs., Sept. 3
Labor Day (No Classes) ..... Mon., Sept. 7
Last day of late registration ..... Wed., Sept. 9
Last day to apply for fall graduation ..... Thurs., Oct. 15
Mid-term grades for freshmen ..... Oct. 15-29
Last day for student-initiated withdrawals ..... Wed., Nov. 5
Thanksgiving holiday ..... Thurs.-Fri., Nov. 26-27
Study Day (No Classes) ..... Fri., Dec. 11
Final examinations ..... Sat.-Wed., Dec. 12-16
Grades due to Admissions and Records
from faculty ..... Noon, Mon., Dec. 21

1988 Spring Semester

Early Orientation for New Students (EONS) ..... Mon.-Tues., Jan. 11-13
Registration materials and advisers available ..... Mon., Jan. 11
Registration: course selection ..... Tues., Jan. 12
Registration: fee payment ..... Wed.-Fri., Jan. 13-15
First day of instruction ..... Thurs., Jan. 14
Last day of late registration ..... Wed., Jan. 20
Last day to apply for spring graduation ..... Mon., Feb. 15
Mid-term grades for freshmen ..... Feb. 29-Mar. 11
Spring recess ..... Mar. 14-18
Last day for student-initiated withdrawals ..... Wed., Mar. 23
All Campus Day (no classes) ..... Fri., Apr. 22
Final examinations ..... Mon.-Thurs., May 2-5
Commencement ..... Sun., May 8
Grades due to Admissions and Records
from faculty ..... Noon, Mon., May 9

1987

June

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1988 Summer Sessions

First Six-Week Session

Registration ..... Tue., May 31
First day of classes ..... Tue., May 31
Last day of classes ..... Fri., July 8

12-Week Session

Registration ..... Tue., May 31
First day of classes ..... Tue., May 31
Last day of classes ..... Fri., Aug. 19

Three-Week Session

Registration ..... Mon., June 6
First day of classes ..... Mon., June 6
Last day of classes ..... Fri., June 24

Second Six-Week Session

Registration ..... Mon., July 11
First day of classes ..... Mon., July 11
Last day of classes ..... Fri., Aug 19

1988 Fall Semester

Early Orientation for New Students (EONS) ..... Sat.-Mon., Sept. 4-6
Registration Materials and Advisors Available ..... Tues., Sept. 6
Registration: Course Selection ..... Tues., Sept. 6
Registration: Fee Payment ..... Thurs.-Mon., Sept. 8-12
First Day of Instruction ..... Thurs., Sept. 8
Last Day of Late Registration ..... Wed., Sept. 14
Last Day to Apply for Fall Graduation ..... Fri., Oct. 14
Mid-Term Grades for Freshmen ..... Oct. 20-Nov. 3
Last Day for Student-initiated Withdrawals ..... Wed., Nov. 9
Thanksgiving Holidays ..... Thurs.-Fri., Nov. 24-25
Study Day (No Classes) ..... Thurs.-Fri., Dec. 15-16
Final Examinations ..... Sat.-Wed., Dec. 17-21
Grades Due to Admissions and Records from Faculty ..... Noon, Tues., Dec. 27

1989 Spring Semester

Early Orientation for New Students (EONS) ..... Mon.-Tues., Jan. 9-10
Registration Materials and Advisors Available ..... Mon., Jan. 9
Registration: Course Selection ..... Tues., Jan. 10
Registration: Fee Payment ..... Wed.-Fri., Jan. 11-13
First Day of Instruction ..... Thurs., Jan. 12
Last Day of Late Registration ..... Wed., Jan. 18
Last Day to Apply for Spring Graduation ..... Wed., Feb. 15
Mid-Term Grades for Freshmen ..... Feb. 27-Mar. 9
Spring Recess ..... Mar. 13-17
Last Day for Student-initiated Withdrawals ..... Wed., Mar. 22
All Campus Day (no classes) ..... Fri., Apr. 21
Final Examinations ..... Mon.-Thurs., May 1-4
Commencement ..... Sun., May 7
Grades Due to Admissions and Records from Faculty ..... Noon, Mon., May 8

(Note: 1988-89 dates are subject to change.)

1988

May

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1989

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May

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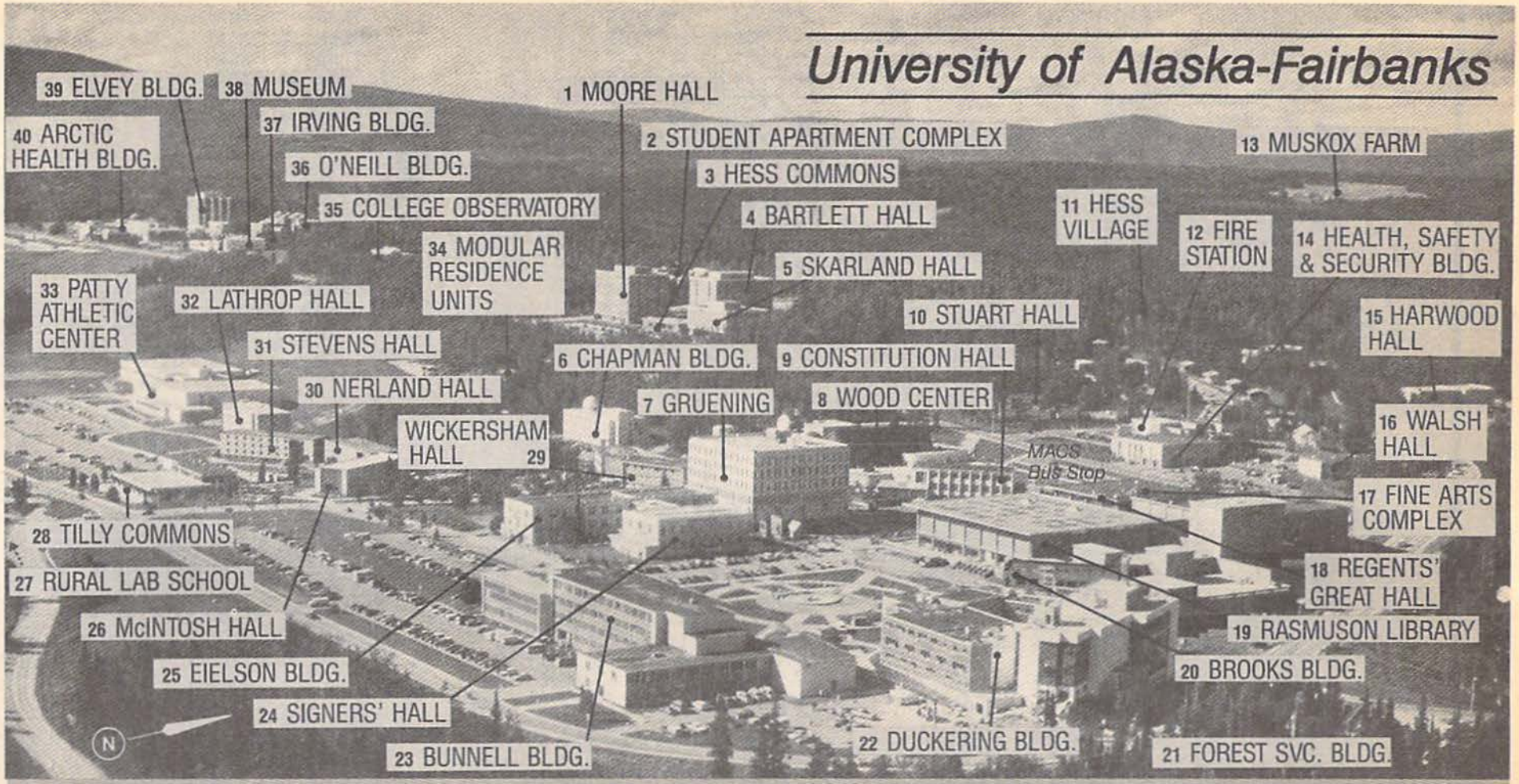


CLASSROOM, STUDENT RESIDENCE, AND ACADEMIC SUPPORT BUILDING LOCATOR MAP - UAF

Arctic Health Building.....40	Fine Arts Complex 17	McIntosh Hall 26	Rural Laboratory School.....27
Bartlett Hall.....4	Fire Station 12	Modular Residence Units 34	Signers' Hall 24
Brooks Building 20	Forest Service Building.....21	Moore Hall 1	Skarland Hall 5
Bunnell Building 23	Gruening Building.....7	Museum 38	Stevens Hall 31
Chapman Building 6	Harwood Hall 15	Muskox Farm 13	Stuart Hall.....10
College Observatory 35	Health, Safety & Security Bldg14	Nerland Hall 30	Student Apartment Complex ..2
Constitution Hall.....9	Hess Commons 3	O'Neill Building.....36	Tilly Commons 28
Duckering Building 22	Hess Village 11	Patty Athletic Center.....33	Walsh Hall.....16
Eielson Building 25	Irving Building 37	Rasmuson Library 19	Wickersham Hall.....29
Elvey Building.....39	Lathrop Hall 32	Regents' Great Hall.....18	Wood Center.....8

General Information

University of Alaska-Fairbanks

Special Mission

UAF 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 services 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.

UAF 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 UAF, 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 101 of the Eielson Building. All concerns and/or allegations that relate to Title IX are to be directed to the Fairbanks campus Title IX coordinator.

Historical Dates

1917 - Alaska Agricultural College and School of Mines created by the Territorial Legislature.

1922 - College opens with six faculty members and six students.

1923 - First Commencement held for first graduate.

1935 - Territorial Congress changes college name to the University of Alaska.

1946 - Geophysical Institute established by an Act of the U.S. Congress.

1947 - First summer session established at the university.

1957 - First Ph.D. degree awarded at the university.

1960 - Institute of Marine Science established by the Alaska Legislature.

1963 - Institute of Arctic Biology established by the Alaska Legislature.

1975 - Creation of the UA System, with campus-specific administrations—Fairbanks campus referred to as UAF from now on.

1980 - Museum moves into Otto Geist Building.

1981 - Enrollment tops 5,000 students for the first time.

1984 - Increasing international awareness results in emphasis on cooperative agreements with international universities.

1986 - GNOSIS computer cataloging library system comes on-line.

Accreditation/Memberships

UAF 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, the Alaska State Board of Education in accordance with standards set by the National Association of State Directors of Teacher Education and Certification and the Council on Social Work Education.

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.

Fairbanks Assembly

The primary organization for university governance is the Assembly. The Fairbanks Assembly of UAF 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 Board of Regents Policy. Fairbanks Assembly actions are subject to review and approval by the chancellor. They are binding unless vetoed.

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.

Transportation to the University

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

The UAF 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.

Each semester, the last two days of student registration are held in the historic Signers' Hall, which is the headquarters of the UAF administration.

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.

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 below for the specific degree program in which he/she is interested in order to meet those requirements prior to entrance to the university.

HIGH SCHOOL ENTRANCE CREDIT REQUIREMENTS FOR ALL PROGRAMS:
(Total of 11 academic credits required including those listed below.)

	English	Mathematics	Social Science	Natural/ Phys. Sci.
H.S. Core Courses: Required for all freshmen (2.00 gpa in core-11 credit total)	3	2	2	2 (Incl. 1 cr. lab. sci.)
College of Human and Rural Development All majors		Same as Core		
College of Liberal Arts: Applied Statistics, Computer Science or Mathematics majors	3	Algebra-2 Geometry-1 Trig-½ Adv Math-½	2	Nat. Science-1 Physics or Chemistry-1
Physical Educ. majors	3	Algebra-2	2	Biology-1 Physics or Chemistry-1
All Other Liberal Arts majors		Same as Core		
College of Natural Sciences: All majors	3	Algebra-2 Geometry-1 Trig.-½	2	Physics or Chemistry-1 Biology or Elective-1
School of Agriculture and Land Resources Management: Land Resources Mgt. majors	2	Algebra-2 Geometry-1 Trig-½	2	Physics or Chemistry-1 Biology or Elective-1
School of Engineering: All majors	3	Algebra-2 Geometry-1 Trig-½	2	Chemistry-1 Physics-1
School of Management: All majors*	3	Algebra-2 Geometry-1 Trig-½	2	2 (Incl. 1 cr. lab. sci.)
School of Mineral Engineering: All majors	3	Algebra-2 Geometry-1 Trig-½	2	Physics or Chemistry-1 Nat. Sci.-1

*Two years Foreign Language highly recommended.

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 undergraduate 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 **UA Community College Transfer of Credit***
   The evaluation of UA community college credit (and the 100- and 200-level credit from the UA Community College Rural Education Extention Centers) 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.

   According to the provisions of the University of Alaska System Transfer Agreement, admission to baccalaureate programs at UAF is subject to timely completion of the appropriate application procedures and to the availability of space. Transfer of 34 credits toward any UAF baccalaureate degree will be offered to those students who have earned the associate of arts degree at UA community colleges or who have completed course work as described in the agreement. Additional credit will be accepted up to the 72 credit limit as specified in the general transfer policy.

   The 34-credit general education requirement outlined in the transfer agreement is intended to provide the nucleus of a broad cultural background that includes a critical awareness of the human heritage, of the challenging requirements and opportunities of the present and future, and of the complexities and possibilities of the human mind and personality. Self-fulfillment and excellence in a career in the arts, in the professions, in the sciences, or in any of the many ways in which a student may eventually serve our society will depend in large measure upon the breadth of this background.

Students admitted under the transfer agreement who have satisfactorily completed course work at the 100-level or above which meets the following criteria shall be considered to have met 34 credits of general education requirements, applicable to baccalaureate degrees at UAF. Credit may be counted toward general education requirements or major requirements, but not both.

Written Communication Skills	6 credits
Oral Communication Skills	3 credits
Humanities/Social Sciences	15 credits
At least three credits in the arts	
At least three credits in the general humanities	
At least six credits in the social sciences, from two different disciplines	
Quantitative Skills/Natural Sciences	10 credits
At least three credits of quantitative skills	
At least four credits of natural sciences, including one laboratory course	
TOTAL	34 credits

NOTE:
(1.) Course work applicable to general education requirements at UAF is identified in the *Alaska Transfer Guide* and in the course description section of this catalog.
(2.) Additional general education requirements beyond this 34 credit core are required for individual baccalaureate degrees.
(3.) Credit awarded through such means as petitions, examinations, or credit for life experiences by a community college will be subject to validation by UAF.

b **UA Transfer of Credit — Other Units:**
Course credit at the 100-level or above from the University of Alaska-Anchorage and the University of Alaska-Juneau, and 300-400 and graduate level credit from CCREE centers shall be accepted at full credit.

4. Credits earned at the 100-level or above 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.

*Note: Potential restructuring changes within the University of Alaska statewide system may affect the status of some community college credit with UAF.

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 — Additional admission requirements apply to international students and recent immigrants to the United States.

English Language Proficiency Policy — In addition to meeting regular admission requirements, a foreign student must be able to read, write and speak the English language well enough to do college level work successfully.

1. 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 test can be used, nor may any other proof of English competency be substituted (such as English credits from other schools).
2. A TOEFL score is required for Permanent Residents (immigrant visa) when all the formal education of the applicant is from a country where English is not the primary language, or if the documents presented for admission do not clearly indicate the applicant's proficiency in English.
3. For undergraduate admission, applicants must present a TOEFL score of at least 550.
   a. A request for waiver of the TOEFL requirement must be addressed to the Foreign Student Adviser. Such requests will be approved only under exceptional circumstances.
4. For graduate admission, applicants must present a TOEFL score of at least 550.
   a. Graduate applicants who present scores below 550 may request a waiver of the TOEFL requirement from the Foreign Student Adviser. The Foreign Student Adviser will make such recommendations subject to final review and approval by the Director of Graduate Programs and the cognizant academic dean.
   b. A waiver will be granted only under *exceptional* circumstances, at the discretion of the Foreign Student Adviser. If a waiver is granted, it will include a requirement for enrollment in appropriate English as a foreign language (EFL) courses with a corresponding reduction in the graduate course load. The Foreign Student Adviser will determine that EFL class space is available prior to granting the waiver.

Other Requirements — 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 a 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 non-degree seeking student 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 score is 26 or higher may receive credit for English 111 by enrolling in a 200 or 300 level *literature* course and completing it with a grade of "C" or better. Or, the student may receive credit for English 111 by waiting until he/she has sophomore standing *(30 credits or more)* and then completing English 211 or 213 with a grade of "C" or better. It is the responsibility of the student to submit an "Application for English 111 Credit" form to the Office of Admissions and Records at the end of the semester in which an advanced English course described in the above policy was completed.

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 completes Math 201, 202, 273 or 302 with a grade of C or better, the student may also receive credit for any prerequisite calculus course.

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.

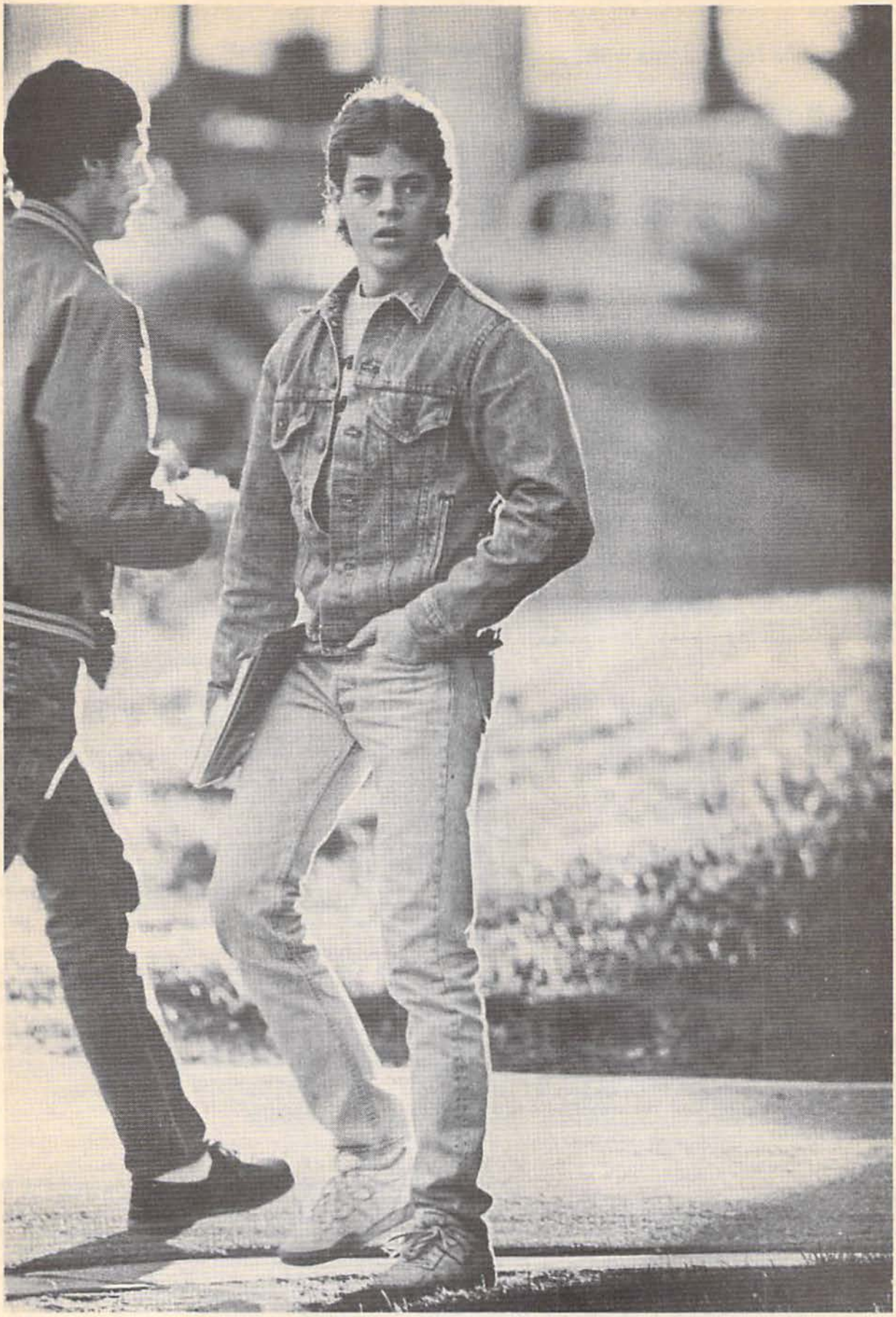
Applying for Admission

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.

A person cannot make reservations for on-campus housing until his/her application for admission has been accepted. It is recommended that application for admission materials be filed at least six months prior to

Doug Broad, a freshman at UAF, looks for a classroom during the first week of school in the fall of 1986.



the date the applicant plans to enroll if he/she is interested in single student housing. For information about availability of married student housing, contact the housing office.

How to Apply

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

Immunization Policy

UAF requires the following to be supplied by all new students admitted for nine or more credits:

1. A completed health inventory form to be returned to, and kept on file with, the Center for Health and Counseling;
2. A report of negative tuberculin skin test or chest x-ray;
3. Written proof from a medical authority of immunity to:
   a. Rubeola (measles)
   b. Rubella
   c. Diphtheria and Tetanus
   d. Polio

Registration may be withheld for a student's second semester pending compliance with above.

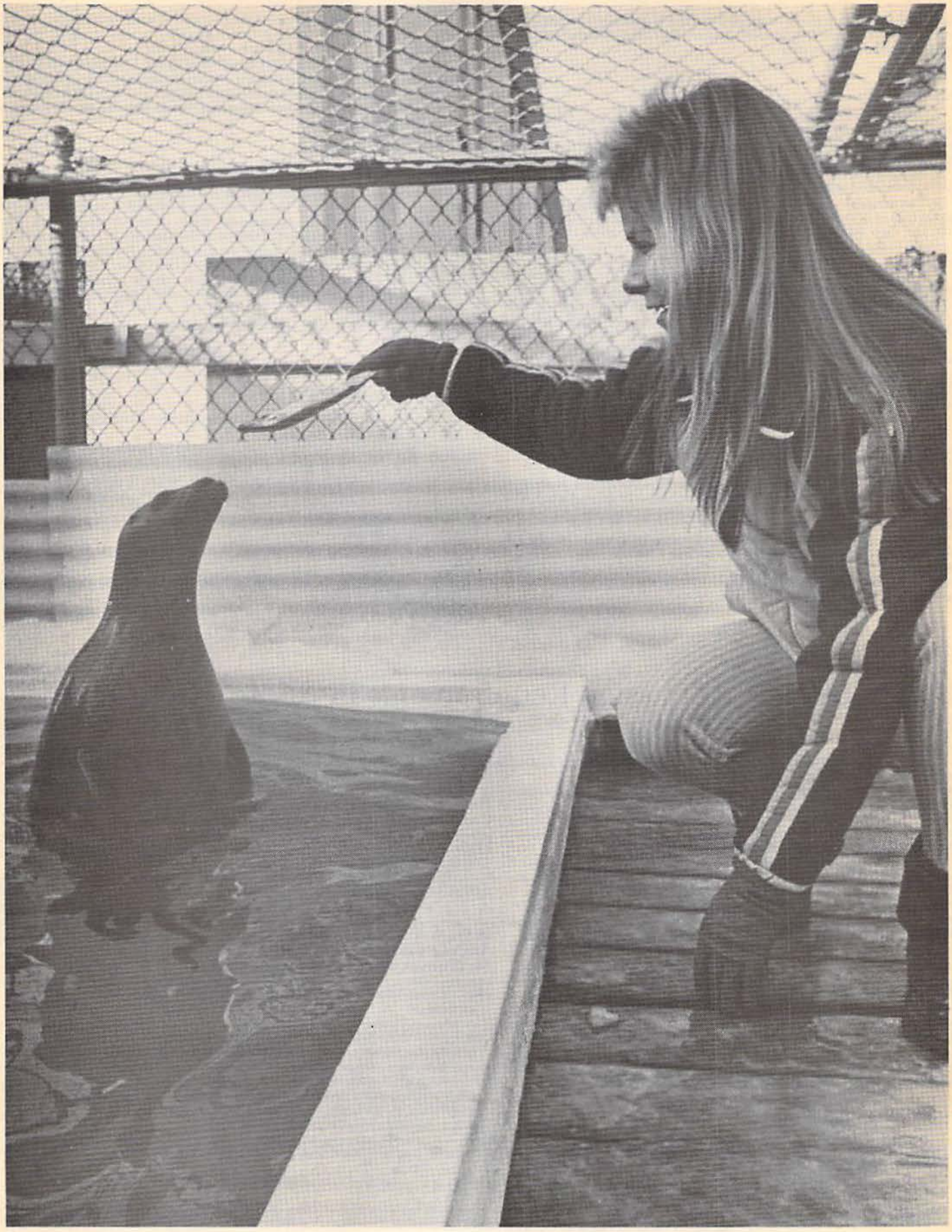
Undergraduate Admission Requirements in Brief

Admission Category	*Admission Requirements*
Freshman*	High school graduation and GPA of 2.00 (C) Completion of 11 credit core with 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.

Laurie Wickham, a graduate student at the Institute of Marine Science, is helping with a study of the navigational ability of ring seals, to determine how they find holes in the thick arctic pack ice. The seals are housed in an aquatic tank on the West Ridge of UAF.



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. (See also "Admission Requirements for Others — Foreign Students".)

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.)

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 proposal to the Director of Graduate Programs who will coordinate a review process involving an advisory committee of faculty members.

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.

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.

A person cannot make reservations for on-campus housing until his/her application for admission has been accepted. Therefore, it is recommended that application for admission materials be filed at least six months prior to the date the applicant plans to enroll if he/she is interested in single student housing. For information about availability of married student housing contact the housing office.

How to Apply — Read Carefully

Application forms may be obtained from the Office 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. Those wishing to apply for admission into a Ph.D. program must submit a description of their proposed graduate program and of professional goals which the program is intended to achieve. Those wishing to apply for an interdisciplinary M.S. or Ph.D. degree must submit a proposed graduate study plan and an outlined research proposal, with commitment from a UAF faculty member to serve on the student's advisory committee. Contact the Office of Graduate Studies for interdisciplinary application procedures.

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 list on the following page and 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.

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
- 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 Science*
- 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.

*GRE required
**GMAT required

Students utilize the Rasmuson Library for research and study.

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.

Assignment of faculty advisers is based on the student's major. The advising of rural and Native students is available through Rural Student Services.

Academic Honor Code

All students who have enrolled in UAF will work in accordance with the Honor Code. The university assumes that the integrity of each student and of the student body as a whole will be upheld. Honesty is a primary responsibility of each student. It is also the responsibility of each student to help maintain the integrity of the entire student community.

The Honor Code

1. Students will not collaborate on any quizzes, in-class exams, or take-home exams that will contribute to their grade in a course, unless permission is granted by the instructor of the course. Only those materials permitted by the instructor may be used to assist in quizzes and examinations.
2. Students will not represent the work of others as their own. A student will attribute the source of information not original with himself or herself (direct quotes or paraphrases) in compositions, theses and other reports.
3. No work submitted for one course may be submitted for credit in another course without the explicit approval of both instructors.

Violations of the Honor Code will result in a failing grade for the assignment and, ordinarily, for the course in which the violation occurred. Moreover, violations of the Honor Code may result in suspension or expulsion of a student from UAF.

Instructors shall either deal with suspected violations of the Honor Code themselves or refer such matters to the University Disciplinary and Honor Code Committee (UDHCC). If the instructor believes that a student should be suspended or expelled from the university for an Honor Code violation, the instructor must request a hearing before the UDHCC. The UDHCC shall decide if the Honor Code has been violated. If it has not been violated, the instructor will evaluate the assignment according to his or her normal procedures. If it has been violated, the instructor will determine how this violation affects the student's grade for the course; the UDHCC will recommend to the Dean of Students whether the student should be dismissed from UAF. The UDHCC operates under procedures outlined in the "A" Book.

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	60-89 credits
Senior	90 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 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 and is not considered as part of the semester study load for full-time, part-time classification.

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 those with course numbers ending -90 through -99 (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 Office of Testing Services.
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.
H. English by Examinations: English 111, 211 (or 213), general educational composition requirements, may be challenged through the English department under special circumstances. Information is available in the English department office.

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. (Students should check financial aid regulations before electing the credit-no-credit option.)

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 nine 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 Office of Admissions and Records.

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, taken for credit by examination, or taken 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), ENR (enrolled), 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** — The grade "pass" indicates satisfactory completion of course requirements at either the undergraduate or graduate level. A "pass" grade does not affect the grade point average but credits earned with "pass" grades may apply toward meeting degree requirements and may be used as a measure of satisfactory progress. Satisfactory performance is the equivalent of a grade "C" or better in undergraduate coursework and "B" or better in graduate courses.
S **Satisfactory** — Used only to indicate satisfactory final completion of 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.")

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 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 which may be obtained at the Graduate Studies Office. 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.")

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.

Because of enrollment pressures, it is English department policy to drop from the class roll students who fail to attend the first two meetings of a composition course (Engl. 100, 111, 211, 213, 313, and 414), even if they have preregistered. In addition, it is policy in the Department of Speech and Drama to drop from the class roll students who fail to attend the first two meetings of a basic course (Sp.C. 121, 131, and 141) even if they have preregistered.

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 if space is available 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 and 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.

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 after the ninth week 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 Vice Chancellor for Academic Affairs, the Chancellor, and then the Fairbanks Grievance Council.

Students walking between classes enjoy the temperate weather that is common during the beginning of the fall semester.

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.

The catalog of record for a graduate student shall be either the catalog in effect at the time of graduation or the catalog in effect during the first semester of enrollment after formal admission to a graduate program, provided that the student shall have been continuously enrolled and provided that the maximum time limits on coursework and completion of the degree shall not be exceeded.

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 and 213 are primarily courses in writing, either will satisfy the second half of the requirement in written communication for the bachelor's degree. Students may not enroll in English 211 or 213 without having fulfilled the English 111 requirement in one of the following ways: complete the course with a passing grade; challenge the course successfully; earn an English ACT score of 26 or higher; present a CEEB APT score in English of 3 or higher.

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 or 213†	6
Speech Communication	3
Humanities:†	
Any combination of courses at the 100 level or above, selected from at least 3 disciplines exclusive of major/minor, 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 exclusive of major/minor, 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, 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, Athletic Coaching, Citizens' Law, 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 or 213†.....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.

Optional Minor — A student may elect to complete a minor with the B.S. degree under the following circumstances:

1. The minor must be declared before the beginning of the student's final semester in the B.S. degree program.
2. Any minor approved for the B.A. degree may serve as a minor for the B.S. degree. All general and specific requirements for minors are the same as those listed for B.A. degree minors, including that courses used to meet minor requirements may not be used to meet general distribution requirements. The catalog used for the minor must be the same as used for the major and general degree requirements.
3. Requirements for the minor must be satisfactorily completed before the B.S. degree is awarded. The minor then will be listed on the student's permanent academic record along with the recording of the B.S. degree.

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 or 213†.....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 or 213†.....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

†Neither English 313 or 314 will fulfill the second half of the written communication requirement or the humanities distribution requirement

"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.
Major Available for B.F.A. Degree: Art.

Course Classification Identification

Courses that may be used in satisfying general degree requirements (e.g., Social Science Elective, Written Communication, etc.) are identified in the course description section of this catalog by the following designators:

h - Humanities	o - Oral Communication
m - Mathematics	s - Social Science
n - Natural Science	w - Written Communication

For example, Hist. 341, History of Alaska, (3+0)s, may be utilized to satisfy the "social science elective" requirement. Engl. 111, Methods of Written Communication, (3+0)w, may be used to meet the written communication general degree 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 Admissions and Records.

Petitions to waive general university or degree requirements must be approved by the Vice Chancellor for Academic Affairs. Such petitions first must be submitted to the Office of Admissions and Records.

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 six 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 nine 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.
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 nine 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 six-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 or 213 - 3 cr	Engl 111 - 3 cr Engl 211 or 213 - 3 cr	Engl 111 - 3 cr Engl 211 or 213 - 3 cr	Engl 111 - 3 cr Engl 211 or 213 - 3 cr	Engl 111 - 3 cr Engl 211 or 213 - 3 cr	Engl 111 - 3 cr Engl 211 or 213 - 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	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.	**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.)		**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 Secondary integrated major/minor - 45 - 48 cr	Variable		**Major Complex or Specialty**
Minor Complex	At least 12 credits						**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 10 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.

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. There are two categories of extended registration: 1) Off Campus — for graduate students who are actively working toward a degree but are not in residence and do not use university facilities ($100 fee per semester); and 2) In Residence — for students needing to use facilities and faculty advisement ($175 fee per semester). Students on extended registration in residence who are considered full-time by their department and the Graduate Studies Office pay full-time student activity fees and medical insurance fees, and may receive certification of full-time status for deferment of student loans.

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.

Kim Renshaw, a junior majoring in education at UAF, uses the academic computing facilities in the Rasmuson Library for writing papers.

Deadlines for Graduate Students

(*See also* 1987-88 and 1988-89 Academic Calendars.)

	Summer 1987	Fall 1987	Spring 1988
Advancement to Candidacy forms to Office of Graduate Studies	July 1*	Sept. 3	Jan. 15
Final draft of thesis due chairman of advisory committee	July 6	Oct. 9	Mar. 11
Graduation Application due Admissions and Records Office	July 15	Oct. 15	Feb. 15
Final exam form due to Director of Admissions and Records	Aug. 3	Nov. 13	Apr. 8
Final oral exam form due to Office of Graduate Studies	Aug. 3	Nov. 13	Apr. 8
Thesis due to Office of Graduate Studies	Aug. 3	Nov. 13	Apr. 8
Final written exam form due to Office of Graduate Studies	Aug. 14	Nov. 27	Apr. 22

*For summer 1988 graduation.

Fees and Financial Aid

Tuition

Students enrolled in undergraduate credit courses will be charged $40 per credit for residents and $105 per credit for non-residents to a maximum of 12 undergraduate credits. Students enrolling in graduate credit will be charged $75 per credit for residents and $150 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 $675 for residents and $1,350 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	$480	$1260	$675	$1350
11	440	1155	675	1350
10	400	1050	675	1350
0-9	40/cr.	105/cr.	75/cr.	150/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 $4 per credit hour for each on-campus credit to a maximum of $32. 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 $2 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, ASUA book exchange, free legal advice, intramural sports, movies, scheduled social events, student elections, use of Wood Center facilities and a summer campground, and administration of student government.

Credit by Examination Fee — A fee of $15 per credit hour will be charged.

Graduate Extended Registration Fee — Graduate students extending registration from previous semester must pay the graduate extended registration fee of $100 or $175.

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 30-day 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 $40 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 upper-class registration for each semester.

For more information see Housing.

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.

Transcript Fee — Official and unofficial transcripts of UAF academic records are prepared for a fee of $3 for each copy. Normal processing time is two weeks; however, at the end of a semester or at other times during the year, four weeks should be allowed for processing time.

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 $10, 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 $5 fee will be charged. Therefore, when a person needs immediate service for two transcripts, the fee will be $15. 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), $145 (fee for music major is $75); class instruction (class lesson course), $70 (fee for music major is $35); class instruction (functional piano course), $70 (fee for music major is $35). 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 $105 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 $70.

Parking Fee — A $75 annual fee is charged for on-campus automobile parking.

Preregistration Deposit — A $50 deposit is required to be paid at the time of preregistration by an eligible student completing the process. This deposit will apply as a credit toward the fees for the semester for which the student is preregistering.

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.

Records Duplication Charge — Copies of documents on file in the Admissions and Records Office for a student *(excluding TVCC transcripts)* may be obtained by that student, *if time permits*, upon his or her written request at a cost of $2.00 per page to a maximum charge of $10 per request. These copies are unofficial and will bear a statement to that effect. Mailing copies of documents provided through this service is not available.

Residency Information — Definition of Residency — University of Alaska.

Alaska residents, members of the United States military on active duty and their dependents, members of the Alaska National Guard and their dependents, as well as residents of the Yukon Territory and the Northwest Territories are exempt from a non-resident 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 UAF. 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.
* UAF 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.

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

UAF 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	8.00/credit - Max. $32.00
Course Fees (See Course Description section)	5.00 - 125.00
Credit by Examination Fee	15.00/credit
Graduate Extended Registration Fee	100.00 - 175.00
*Health Service Fee	40.00/semester
*Health Insurance, student (approximately)	80.00/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	255.00-470.00/month
Meal Ticket (approximately)	750.00/semester
Immediate Service Transcript Fee	10.00
Late Placement and Guidance Test Fee	5.00
Late Registration Fee	15.00 - 65.00
Material Use Fee	Variable
Parking Fee	75.00/year
Preregistration Deposit (Applied Toward Registration Fees)	50.00
Program Plan Fee	5.00
Records Duplication Charge	2.00 - 10.00
Transcript Charge	3.00

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

All fees 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 the first day of instruction or the next six calendar days thereafter.
   (c) 50 percent refund — withdrawal on or after the eighth calendar day through the 14th 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 the student complete a Financial Aid Form (FAF).

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:

1. is 24 years old (born before 1/1/64), or
2. is a veteran of the U.S. Armed Forces, or
3. is an orphan or ward of the court, or
4. has legal dependents other than a spouse, or
5. is an unmarried undergraduate who was not claimed by his/her parents as a U.S. income tax exemption in 1985 and 1986 and received total income and benefits of at least $4,000 in 1985 and 1986, or
6. is married or a graduate or professional student and will not be claimed as a U.S. income tax exemption by his/her parents or guardians in 1987.

To receive financial aid, students must be making satisfactory progress toward their educational objective. The university 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 Form (FAF).
3. Financial Aid Transcripts (for transfer students only).
4. Notification of applicants' acceptance by the Admissions Office (for new students only).
5. 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 1987-88 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.

Only course work undertaken in attendance at UAF may count toward financial aid requirements. Community college, 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.

Students whose aid has been terminated due to their not meeting the satisfactory academic progress requirements may appeal the decision. A written appeal request from the student explaining in detail the reason for not meeting the satisfactory academic progress standards and what steps are being taken to meet these standards in the future, will be required. Appeal requests should be directed to the Financial Aid Office where the Financial Aid Appeal's Panel will review all such requests. Students will be notified in writing of the appeal decision.

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 $200 to $2300 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 Financial Aid Form (FAF) and checking "yes" to number 44A and B for the 1987-88 school year. Students should not file for the Pell Grant until their own or their parents' 1986 federal income taxes have been filed with the Internal Revenue Service. All applicants will be required to submit a copy of their own or their parents' signed IRS 1040 (AIEZ) to the Financial Aid Office, or may request the IRS to send a certified copy of the 1986 tax form to the Financial Aid Office.

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 10 semesters and must be enrolled at least on 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 1987 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 may borrow up to $2,625 per year for the first two years of undergraduate study; $4,000 per year for the remaining years of undergraduate study; and up to $7,500 per year for graduate study. The aggregate GSL Loan limits are $17,250 for undergraduates and up to $54,750 for graduate students. 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 $5,500 per year and graduates up to

$6,500. 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, 1987 for students who terminate studies at UAF at the end of the fall 1987 semester; by April 15, 1988 for students leaving at the end of the spring 1988 semester; or by July 15, 1988 for students who will be returning to UAF for the fall 1988 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.

DEADLINES

All applications that are complete by June 1, 1987 will receive first consideration for funding for the 1987-88 academic year.

In order to meet the JUNE 1 priority deadline, students should obtain and complete the FAF by MARCH 1.

Applications which become complete after June 1, 1987 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 99775-0770
PHONE: (907) 474-7256

or

For Foundation Administered Scholarships:

UNIVERSITY OF ALASKA FOUNDATION
590 UNIVERSITY AVE., SUITE 101
UNIVERSITY OF ALASKA
FAIRBANKS, ALASKA 99709
PHONE: (907) 474-7687

or

For Alumni Administered Scholarships:

UAF Alumni Association
201 Constitution Hall
Fairbanks, Alaska 99775-5060
Phone: (907) 474-7081

A summary of all scholarships available to UAF students can be obtained from the Financial Aid Office or University Relations.

Ida Greiner, director of the Financial Aid office, discusses changes in the Alaska Student Loan Program with Don Haas, a junior geography major.

University Of Alaska-Fairbanks
Financial Aid In Brief

Item	*Date/Deadline*
Forms Available	February
Financial Aid Form (FAF)	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 Financial Aid Form should be submitted 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.

The student center on campus, Wood Center, has a cafeteria where students can study over a cup of coffee or meet friends for lunch. Angie Gerken, a junior English major, reads magazines in Wood Center between classes.

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

UAF is experiencing an increased demand for all on-campus housing facilities. Since housing applications are mailed to students with acceptance letters from the Office of Admissions and Records, students should plan to complete their enrollment applications well in advance. 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 already living on campus must complete pre-registration in order to maintain their housing eligibility. 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-request, 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, other weapons, 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 102 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 102 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 95 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 69 men and 33 women 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 (over the age of 21) 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 UA.

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. This complex also has six apartments which were designed to accommodate handicapped students.

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 99775-0880 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, $600 for single rooms and $650 per person in the student apartment complex. 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 99775-0880. 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 the fall semester may be renewed for the spring semester after students complete preregistration.

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.

Students who do not live in University residence halls may be authorized by the Dean of Student Affairs to purchase meal tickets. The charge will be the price of the meal ticket plus a board net charge of $110. The $110 is used to maintain the dining facilities and equipment and is also paid by residence hall students as a part of their rent.

Family Housing

Family housing is provided in several areas. 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. Personal items such as dishes, utensils and bedding are not provided. Parking areas are provided for each housing complex. Pets are not allowed, except at Yak Estates.

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 13 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.

HESS VILLAGE (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. Hess Village is named for Luther Hess, who was a member of the Territorial Legislature, and Harriet Hess, who was a member of the Board of Regents.

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.

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 cleaning/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 99775-0880.

Troy Keturi's room in Lathrop Hall is not your typical dormitory room. Keturi has outfitted it with an entertainment center, panneled walls and two couches. Keturi (on the upper couch) and his friend, Danny Cole, are seniors in business administration.

Student Information

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, UAF 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.

Disabled Students

Curb cuts and ramps have been installed at UAF 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 halls 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 disabled students. Contact the Coordinator of Services for Disabled Students, Center for Health and Counseling, University of Alaska-Fairbanks, Fairbanks, Alaska 99775-0440, (907) 474-7043 or 504 Coordinator, 101 Eielson Building, University of Alaska-Fairbanks, Fairbanks, Alaska 99775-5320, (907) 474-7919.

Honor Societies

Alpha Phi Sigma, — Alpha Phi Sigma is the national honor society for criminal justice students. The society recognizes scholastic excellence by undergraduate and graduate students in the criminal justice sciences. Its purpose is to recognize scholastic achievement and excellence; to encourage research and the dissemination of knowledge gained from research; to inspire pride in their work, and to apply scientific practices and techniques within the criminal justice fields. Students must rank in the top 35 percent of their class to be eligible.

Psi Chi — Psi Chi is the national honor society in psychology. Psi Chi's purpose is to advance the science of psychology and to encourage, stimulate and maintain scholarship of the individual members in all fields. To be eligible, students must rank in the top 35 percent of their class.

Phi Kappa Phi — Phi Kappa Phi is a national honorary society which recognizes outstanding scholarship in all fields of study. New members are elected by the local chapter. Undergraduates are selected from the top 10 percent of the senior class and the top 5 percent of the junior class. Graduate students are selected on an individual basis from among the top 5 percent of all graduate students, and faculty are selected individually after nomination by a member of the local chapter.

Sigma Xi — Sigma Xi is an honor society for scientists. Its goals are to advance scientific research, to encourage companionship among all scientists, and to assist the wider understanding of science. Recent graduates and others who have shown their potential ability in research are elected as associate members. When that potential has been realized in publications, patents, or other research achievements, scientists are eligible for full membership.

Tau Beta Pi — Tau Beta Pi was founded in 1885 to recognize outstanding students in engineering, and nationally there have been over 300,000 initiates in 196 chapters. The UAF chapter was chartered in 1975, and to date more than 200 members have been initiated. Membership is open to engineering majors of good character, who are in at least their third semester at UAF, and who are academically in the upper one-fifth of the senior class, or the upper one-eighth of the junior class.

New Student Orientation Program

Prior to registration each semester (fall and spring), Early Orientation for New Students (EONS) is offered to all new students. Materials concerning this program are forwarded to students two months before the semester begins. 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.

At the beginning of each semester, a special orientation program is provided for adults who are considering pursuing college studies after an absence from formal education. This program is sponsored by ADRES (Adult Re-Entry Services), which is located within the Career Planning and Placement Office. Students who attend the adult student orientation do not need to attend EONS.

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. Students should become familiar with these regulations as published in the student handbook, The A Book.

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 university after appropriate review.

Academic Opportunities

Alaska Native Programs

Alaska Native Programs is a group of seven programs and related activities in Native education which were consolidated in 1981 in the College of Liberal Arts. The programs are the Alaska Native Art Center, the Alaska Native Language Program, Alaska Native Language Center, 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 second floor of the Eielson 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.

Conferences and Continuing Education

Conferences and Continuing Education performs public service and instructional functions. It houses UAF's professional conference management service, with 12 years of experience in educational conferences and professional conventions. It includes an Evening and Weekend College, enabling working adults to pursue a degree. It also extends UAF through short courses, non-credit continuing education programs for professionals, managerial development briefings, and seminars and workshops on topics of general interest or community concern. Through this continuing education program, C & CE can initiate and offer certificate programs to recognize specialized training or advanced professional development.

Evening and Weekend College

Conferences and Continuing Education provides academic courses during evening hours and at off-campus locations. The alternative course schedules and delivery modes are designed to facilitate access for working adults, military personnel and other students whose work, community, or family commitments preclude their participation in resident, semester-based programs. Some courses are enhanced through television instruction or computer-aided programs to permit students to progress at their own pace. Night and weekend courses are offered to allow the student to work toward a Bachelor of Business Administration degree or fulfill the general university requirements for the Bachelor of Arts degree. C & CE also serves the non-degree seeking student with evening courses designed for general interest.

Conference Management Service

For over 12 years Conferences and Continuing Education has been the leading provider of conference management services in Alaska. Scientists, professional organizations, issue-oriented constituencies, and other groups use these services extensively. These services are provided throughout the state. They include program development, logistics, advertising and marketing, registration, financial management, on-site services, and post conference services including proceedings.

Continuing Education Program

In over 100 programs each year, Conferences and Continuing Education takes the lead in responding to individual and community needs for innovative training and high quality education. Academic short courses and non-credit workshops are designed for professionals needing technical training, health and human services, personnel needing advanced skills, or employers and employees seeking techniques for improved work performance. C & CE provides in-services for teachers, in-house supervisory skill seminars for small business owners, and general programs for cultural enrichment as well.

Conferences and Continuing Education assists faculty, staff, and students seeking conference management services. C & CE advises adult students seeking a degree at night. And, C & CE extends UAF resources to provide workshops, seminars, and advanced institutes on- and off-campus. Contact Conferences and Continuing Education, University of Alaska-Fairbanks, 117 Eielson Building, Fairbanks, Alaska 99775-0540; or call (907) 474-7800.

Correspondence Study Program

The University of Alaska Statewide System extends its academic resources through the Correspondence Study Program to individuals who are unable to attend on-campus classes and who wish to pursue instruction at home. Many courses offered through the Correspondence Study Program were developed and are taught by members of the UAF faculty. As a result, many courses are substantially the same in content and scope as those taught at UAF.

A unique advantage of correspondence study is its flexibility; students may select their own hours of study and work at their own pace in completing course requirements. Individuals may enroll in a correspondence course any time during the year and spend up to a year completing the course. Annually, over 2,000 students select correspondence courses to help meet requirements for college graduation, to obtain or renew teacher certification, or to meet personal and professional goals. Formal admission to any unit of the university is not required.

UAF will allow a total of 32 credits of correspondence study to apply toward a baccalaureate degree. Credits earned through the Correspondence Study Program are considered as non-resident transfer credit at UAF and are not counted in the study load or grade point average for UAF students. Repeating a UAF course with an equivalent course through the Correspondence Study Program does not meet the requirements of the repeat course policy at UAF.

For further information and a free brochure, contact the Correspondence Study Program, 115 Eielson Building, UAF Campus, Fairbanks, AK 99775-0560 or call (907) 474-7222.

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.

The Honors Program

The Honors Program at UAF 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 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. All Honors Program students must be full-time students.

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. Late applications will be considered on a space available basis. 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 99775, (907) 474-6612.

International Programs

The International Programs Council coordinates exchange agreements and international affairs at UAF. A variety of cooperative agreements allow teaching, research and student exchange opportunities, with paticular emphasis on Circumpolar North and Pacific Rim universities.

Detailed information on student exchange programs listed below is available by contacting: Director, International Programs Council, 331 Signers' Hall, University of Alaska-Fairbanks, Fairbanks, Alaska 99775, (907) 474-5327.

Gifu University, Gifu City, Japan
Nagoya Gakuin University, Nagoya, Japan
Hokkaido University, Sapporo, Japan
Northwest Interinstitutional Council for Study Abroad (NICSA)
Opportunities for study in England, France, Germany and Mexico
Soong Jun University, Seoul, Korea
University of Copenhagen, Denmark

Students wishing to study abroad at other universities should also contact the International Programs Council office for assistance.

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. 442 — Bacteriology and Immunology	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 99775.

Nursing

The University of Alaska-Anchorage College of Nursing is the only baccalaureate nursing program in Alaska and the majority of the course work is available on the Fairbanks campus. The College 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 College 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 and at risk 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. 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 College of Nursing has received full national accreditation for this program.

Recognizing the barriers that returning RN's encounter in pursuit of their baccalaureate degrees, UAA has developed the RN Sections. As an adult learner with accumulated learning and experience, the RN can articulate well into the degree program. After completion of general education prerequisites and acceptance, the RN can earn 18 credits by successful completion of two written competency validation examinations and a clinical validation. This allows progression to two semesters and a summer session of study with concentration in physical assessment, family and community assessment, environmental health, mental health needs of aggregates, nursing and health care management, nursing research and clinical concentration.

For further information on the baccalaureate nursing program and continuing education offerings in nursing, please contact: UAA College of Nursing, Arctic Health Research Building, Suite 106, University of Alaska-Fairbanks, Fairbanks, Alaska 99775, (907) 474-7764.

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 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 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.

Summer Sessions

A wide variety of 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, marine sciences 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, Signers' Hall, University of Alaska-Fairbanks, Fairbanks, Alaska 99775-1540, (907) 474-7021.

Other Campus Services

Alaska Teacher Placement

Alaska Teacher Placement (ATP) has been designated as Alaska's statewide clearinghouse for educational placement. ATP assists Alaska's public school districts with the employment of educators for their schools.

Educators from Alaska, other states, and around the world register with ATP. When a school district lists a position with ATP, it is referred to registrants. During the summer when school district personnel are on campus interviewing educators, registrants often come to Fairbanks to be available for interviews.

Permanent Placement files for UAF education majors are maintained by ATP.

Contact Alaska Teacher Placement by writing, dropping by the office, or calling. ATP is located in the Moore-Bartlett Complex, 732 Yukon Drive, Fairbanks, Alaska 99775-1550, (907) 474-6644.

Alumni Relations

The UAF Office of Alumni Relations is located on the ground floor of Constitution Hall. The UAF Alumni Association was created in 1986 when the statewide association voted to dissolve in favor of campus-specific associations. In Constitution Hall, the UAF office is located in space originally used by the alumni. Former students and graduates belong to the association, which is also interested in increased contact with UAF's present day students.

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, swimming, fencing, racquetball, tennis, volleyball, water polo, wrestling, 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 (faculty and staff, 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, co-ed rifle and swimming, and women's volleyball, and at the NCAA Division I level in men's ice hockey. 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 and staff. Darkrooms and a general-purpose workroom provide students with areas for developing specific skills. The games area is equipped with pocket billiards, snooker, table tennis, video games and bowling lanes. The area is regularly used for tournaments, classes, and open play. The Pub is also located in Wood Center and provides a wide variety of entertainment to the university community.

Career Planning and Placement

Career Planning and Placement offers students 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 counselors often provide students with methods to change habits, manage stress and gain more control over their lives. 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.

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.

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 activities program is planned for summer sessions students by the Wood Center Programs Office.

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.

Academic and Research Support

Anna Brody, a resident of Nerland Hall, uses her roommate's typewriter for writing letters and school papers.

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 Support Group

The UAF Computer Support Group (CSG) provides administrative and academic computing support for UAF and the GNOSIS Information Systems for the entire University of Alaska System. The UAF CSG is the primary UAF contact with the University of Alaska Computer Network, which provides extensive data communication and computing services to university units.

Most administrative computing is provided for the university by the UACN. The systems are run on an IBM 4381-14 computer configuration located in Fairbanks. Several administrative computing services are provided by UAF-developed and operated systems.

The UACN data communication backbone has been designed so that from any terminal users may access any host in the network on which they have resources. Using over 8,000 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.

Primary academic computing support for UAF is provided through a Digital Equipment Corporation VAX 8800. This system is currently configured with 32 megabytes of main memory, 3.2 gigabytes of disc storage, 128 user-accessible ports, and the VMS operating system. Similar VAX systems are located at the university's Juneau and Anchorage locations, and are accessible through the UACN multiplexing and DECNET data communication facilities. The VAX 8800 is also connected to the BITNET data communication system, facilitating data transfer with several hundred other academic computers worldwide.

Some of the software packages available to UAF academic computing users are: BASIC, PASCAL, APL, FORTRAN, COBOL, C, B, SNOBOL, ALGOL, JOVIAL, SPSS, BMDP, BMD, IMSL, TSP, GPSS, CSMP, Sceptre, ECSP, Cornap, IDS-II, IDMS, DataBASIC, FAMULUS, SELGEM, EDT, RUNOFF, electronic mail, mini- and microcomputer cross assemblers and simulators, Calcomp, Tektronic, Displa, and Hewlett-Packard graphics packages, Contour and SURFACEII mapping packages. TEX is available on the VAX 8800, with output on Apple Laserwriters.

The CSG provides consulting services, access to documentation, seminars and classes, and acts as a "one stop" source for all user help. The CSG supports over 500 terminals and microcomputers installed on the UAF campus. Dial-up ports are used by many students to access the systems from their apartments on campus. Each residence hall is equipped with at least one terminal for student use.

The CSG also provides a microcomputer laboratory with IBM-compatible and Apple II compatible computers for general academic use. This facility is located in the library, and software can be checked out from the library reserve room collection.

Various other departments at UAF have both mini- and microcomputers for research and instruction. The Geophysical Institute has a VAX 11/785, 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, a PDP 11/23, and Masscomp graphics workstations for computer science instruction and other student and faculty research. There are also numerous microcomputer systems available for classroom and student use, notably in the School of Management, the School of Engineering, the education department, and the journalism department.

The GNOSIS information system provides an online catalog to the university's library book collections, online circulation of materials, online access to indexes of special Alaskana materials, teleconferencing, and online access to other university information such as the Alaska Transfer Guide, telephone directories, etc. Since GNOSIS is connected to the UACN, users can peruse the book catalog and various other databases from any terminal on campus. Dialup access is available locally through the UACN and locally, nationally, and internationally through AlaskaNet. GNOSIS is also accessible via a packet-radio interface, and work is in progress to interface it to BITNET.

Elmer E. Rasmuson Library/Media Program

The university library, named in honor of pioneer Alaskan public servant, philanthropist and businessman, Elmer E. Rasmuson, moved into the library building in the Fine Arts Complex in the fall of 1969. A 69,616 square foot addition was completed in the summer of 1985. With the addition, and the remodeling of 22,000 square feet, the six-level library/media facility now totals 181,616 square feet of well-designed space. The library collections consist of more than 1,025,000 bibliographical items in a variety of print and audiovisual media, including books, periodicals and serial titles, government documents, microfilms, microcards and microfiches, archival documents and manuscripts, maps, photographs, phonograph disks, audiocassettes, videotapes and motion picture films.

The Rasmuson Library/Media Program furnishes academic and research support to UAF and Tanana Valley Community College students, faculty and staff members. For Fairbanks North Star Borough residents, the library's holdings greatly increase the quantity of library materials readily accessible. In addition, as the major research collection in the state of Alaska, the Rasmuson Library functions as a statewide resource for library collection development efforts, library automation, serials union listing, university publications distribution, Alaska information indexing and interlibrary loan transactions.

The newly expanded facility provides seating for 985 persons, and includes lounge areas, and closed carrels for use by graduate students and faculty members. The smoking lounge is located on Level 6.

The main book collection is housed on Levels 5 and 6. Materials are classified according to the Library of Congress system.

Level 5 also houses the federal government Documents Collection and Map Collection. The Documents Collection is arranged according to the Superintendent of Documents classification system and constitutes about one-fourth of total library holdings.

The Map Collection, adjacent to the federal documents section, includes an extensive collection of polar regions maps and a complete set of current U.S. Geological Survey topographical maps of Alaska, as well as maps of the other United States, other countries, the world and other planets. Atlases, gazetteers and other cartographic works also are available.

The Juvenile Collection on Level 5 comprises children's books used primarily by teacher education classes.

Because much of the library building is located below ground level, the entrance to the library is at Level 4. The main, or entry level contains the administrative offices, the Distribution Counter, the Independent Learning Area, the All-Hours Study Area, public typewriters, the University of Alaska Computer Network Fairbanks Node, the Library COM (microfiche) and card catalogs, the Research and Reference Assistance Desk and Reference Collection, the periodical and newspaper indexes, telephone directories and college catalogs on microfiche, and study tables for library users.

Non-circulating collections which are housed on Level 3 include current periodicals and newspapers, bound periodical volumes, and newspapers and periodicals in microform. Other microform collections include the Human Relations Area Files (HRAF), the Educational Research Information Center (ERIC) Resources in Education, and the Native American Legal Materials Collection. Microfilm and microfiche readers and printers and coin-operated photocopy machines are available. The Serial Printout and the WLN Serial Update list all serial and periodical titles held by the library with UAF call numbers. Current and back issues of Alaskan, national and foreign newspapers are available, including the complete run of The New York Times (1851 to the present).

Level 2 houses the Alaska and Polar Regions collections, including the world-class Alaska Collection, the university Archives and Manuscripts Collection, the historical photographs, rare books, rare maps, and the oral history materials. The Archives and Manuscripts Collection comprises the official non-current records of the University of Alaska and many primary sources concerning Alaska history.

The library is a participant in the Washington Library Network (WLN), whose automated database contains more than 3,500,000 bibliographic records of more than 250 libraries located from Alaska to Arizona.

Interlibrary loan services are available to students and faculty members through the Communication Technology unit. The library's membership in the University of Washington Library Resource Sharing Program and electronic mail systems make the resources of the larger university libraries in the nation quickly available to augment the resources available at UAF.

Computerized literature searches are also available at actual cost plus $2 for members of the university community through IAS. Computer databases provide access to a wide variety of subject fields.

The library's Instructional Media Production and Communication Technology department (IMPACT) combines two major functions. The Communication Technology unit, located on Level 4, includes the Distribution Counter, where the Reserve Collection and Audiovisual Media Collection are located and where audiovisual equipment may be obtained. Additionally, general library materials are checked out at this location.

The Instructional Media Design, Development and Evaluation unit is housed on Level 3 and comprises Instructional Art/Graphic Communications, Instructional Photography Services, Instructional Television Production, Instructional Audio Production, the Microcomputer Laboratory, the Faculty, Staff and Student Media Laboratory, and the Media Classroom.

Among the many special services IMPACT provides are transparency production, lamination, audio transfer and telecommunications consultation.

The Bio-Medical Library, located in the Arctic Health Research Building on the West Ridge, is a branch of the Rasmuson Library. During the past year, the Institute of Marine Science library was merged with the Bio-Medical Library. Bio-Med collections number approximately 36,000 volumes, the majority of which are bound periodical titles. Journal titles cover the fields of the health sciences, microbiology, animal physiology, fisheries, veterinary medicine, plant pathology and the environment as it relates to cold regions research.

The library handbook, A Guide to Information Research & Services, is available at the Research and Reference Assistance Desk on Level 4 of the Elmer E. Rasmuson Library.

KUAC

UAF pioneered public broadcasting in Alaska, and now holds the licenses for KUAC-FM and KUAC-TV. In 1962, the university introduced KUAC-FM. It was the first public radio station in Alaska, the first FM station in Fairbanks, and a leader in satellite communication, delivering same-day news and information to the 49th state, for the first time ever. Today, KUAC-FM, Stereo 104.7 provides a vital link for about 8,000 listeners in Interior Alaska. In 1971, the university acquired the license for the first public television station in the state, KUAC-TV, Channel 9, now watched by more than 37,000 people each week. As members of the National Public Radio, the American Public Radio, the Alaska Public Radio Network, and the Public Broadcasting Service, the Pacific Mountain Network, and the Public Television Network of Alaska, KUAC-FM and KUAC-TV feature national public broadcasting programs. But each station enhances its schedule with locally produced programs emphasizing Alaskan cultural, public and political affairs. All programs are selected on the basis of their quality and their service to education and the arts.

The facilities used to produce the local programs also provide a laboratory for UAF students in the Department of Journalism and Broadcasting. Students are encouraged to gain hands-on experience, and many pursue internships and part-time employment at the stations, located in the Fine Arts/Theatre building.

In partnership with UAF, KUAC offers a variety of broadcast courses. These college credit courses, broadcast over television and radio, allow the convenience of attending college without leaving home or office. Under the supervision of a faculty member, each course revolves around a series of television or radio programs and is accompanied by textbooks, study guides and other materials. Since 1982, KUAC has broadcast telecourses in sociology, earth sciences, psychology, economics, English, political science and aviation.

Through public radio and television, UAF has increased the scope of its educational and public service activities far beyond the campus in Fairbanks.

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.

College Observatory — The College Magnetic and Seismological Observatory is operated by the Branch of Global Seismology 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.

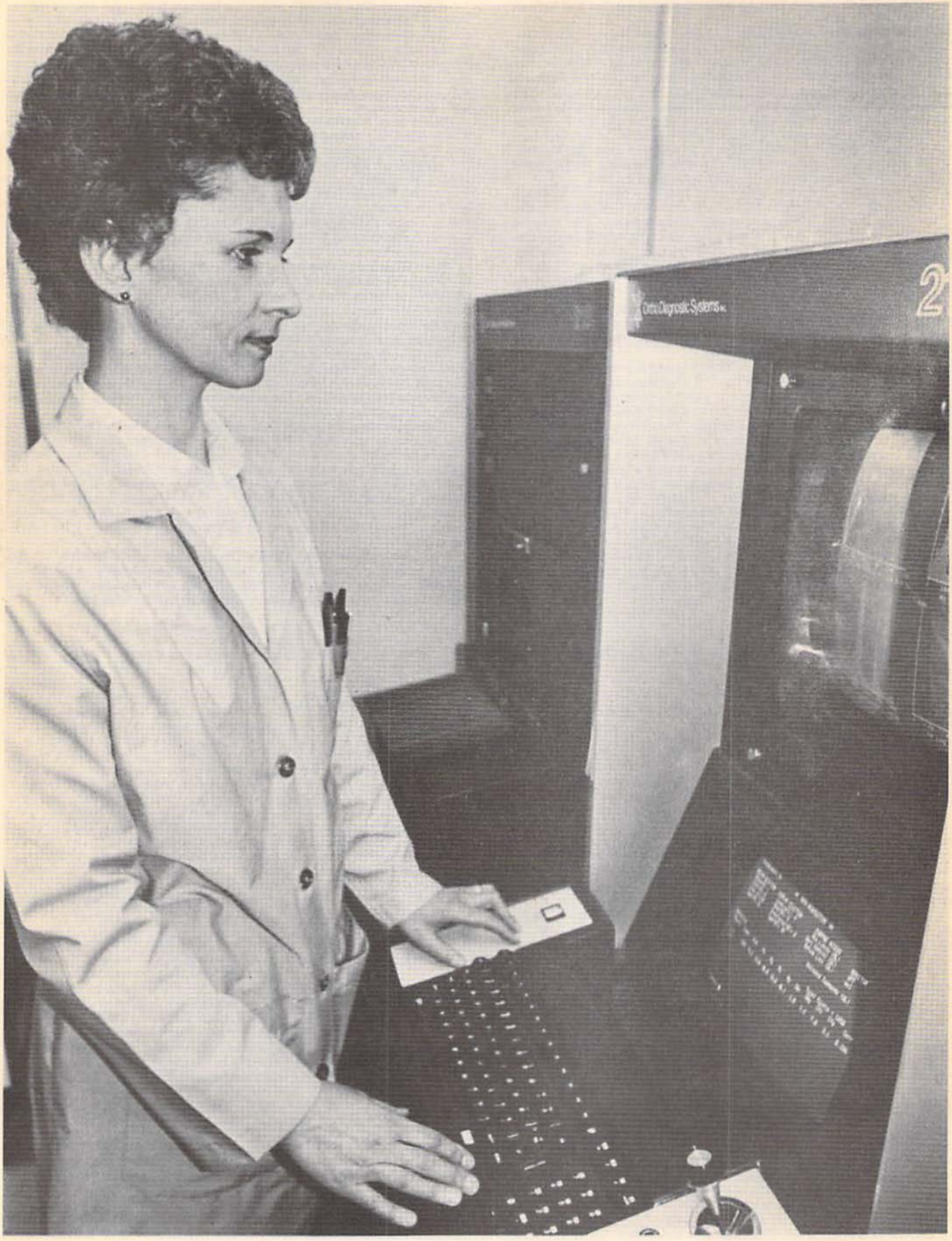
State Division of Geological and Geophysical Surveys — As part of the Alaska Department of Natural Resources, this division conducts cooperative investigations with university personnel and government agencies to contribute to the knowledge of Alaska's natural resources. The staff includes archeologists, data processors, engineering geologists, geochemists, geologists, geophysicists and hydrologists.

The laboratory provides analytical services to the staff and also conducts independent research. Field programs are carried out by the scientific staff. Technical information and advice are available to prospectors, exploration companies and the general public. A variety of technical reports and maps are available for sale and for free.

Transportation Research Laboratory — The Alaska Department of Transportation and Public Facilities operates a research laboratory in conjunction with the School of Engineering. The university and the department jointly purchase equipment and share laboratory facilities. Engineering faculty and students are involved in research projects which include highway, airport and public facilities design, construction and maintenance, and marine transportation issues. Graduate student thesis projects often involve Department of Transportation and Public Facilities topics.

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 zoonotic viral diseases.

Betsy Robertson, research associate with the Institute of Marine Science, calibrates a flow cytometer, which is used for counting one-celled organisms in sea water.



Research

The research programs at UAF 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 efficiency 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; (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 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 staff represents 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 and Wildlife Research Units - These units are jointly sponsored and financed by UAF, the Alaska Department of Fish and Game and the U.S. Fish and Wildlife Service. The units provide financial support and guidance for graduate training in fishery and wildlife biology and management and carry out research related to graduate training.

Research emphasis of the Fishery Unit is on the ecology and fisheries of aquatic ecosystems, alteration and contamination of Alaskan freshwaters, and evaluation and development of cold water fisheries techniques. The Wildlife Unit research is directed toward ungulate habitat relationships, waterfowl and seabird ecology, wildlife population dynamics, and the impact of northern development on wild animals and their habitats.

Most research projects of the units are field-oriented and conducted by graduate students in close cooperation with university faculty and agency biologists. Graduate work leading to both master's and doctoral degrees in regular university programs may be supported through the units.

Alaska Native Language Center — The Alaska Native Language Center was established by state legislation in 1972 to document and promote the cultivation of the Indian and Eskimo languages of Alaska. It is part of the College of Liberal Arts and is the major center in the United States for the study of Eskimo and Northern Athabaskan. Many of the staff in addition to doing research, also teach courses in the Alaska Native Language Program. The center's library houses a valuable collection of manuscript materials in and on Alaska Native languages. It is available for use by scholars and 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.

Geophysical Institute — The institute, since its establishment by an Act of Congress in 1946, has earned an international reputation in the study of the earth and its physical environment at high latitudes, and in the training of students in related disciplines. It is one of the few institutions in the country where scientific expertise covers the whole spectrum of geophysical disciplines in a single cohesive institute and where scientists from these diverse disciplines work adjacent to each other.

Programs are established in solar and interplanetary physics, radio physics, magnetospheric, ionospheric and thermospheric physics, auroral physics and chemistry, atmospheric dynamics, cloud physics and radiation, regional meteorology and climatology, aerosols and gases, permafrost, sea ice and river ice, snow and glaciers, paleomagnetism, seismology, volcanology, tectonophysics, geochronology, geothermal energy, geology/geophysics, ice engineering and remote sensing.

The institute is housed in the C.T. Elvey Building on the West Ridge of campus. The present staff numbers approximately 200, including 40 faculty members. Financial support is obtained from the state of Alaska and, in large part, from federal agencies.

Research facilities include the Ester Dome, Poker Flat and Fort Yukon Optical Observatories for auroral and ionospheric studies, the Sheep Creek radio transmitter station, the Chena Valley Radio Facility (presently utilized by UCLA), the Poker Flat Research Range (the only university-owned research rocket launching facility in the world), a potassium-argon geochronology laboratory and a large computer facility. In addition to these local facilities, the institute operates many field stations throughout Alaska, Canada, and elsewhere, such as the Augustine Volcano station, a network of seismic event recorders, and a geomagnetic meridian chain of optical and magnetic observatories. The institute's specialized library and archives offer an excellent coverage of geophysics. Technical support is provided by an engineering staff and a number of shops providing services in computer programming and data entry, electronics, metal and wood working and fabrication, photography, drafting and graphics.

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

Institute of Arctic Biology — The Institute of Arctic Biology is the principle research arm for life scientists in the College of Natural Sciences. The institute was established in 1963 through authorization from the Alaska Legislature following the recommendation of a select committee of nationally and internationally recognized biologists. The original mandate of the institute, the study of adaptations of plants, animals and man to past and present climates of the Arctic, is maintained but has been expanded to include well-developed programs in ecology and systematics. Ecology programs include research on taiga and tundra sites, including community organization, ecosystem structure and function, functional interactions and interdependencies of plants and animals and the way in which environmental and organismal processes modify nutrient cycling and decomposition within systems. These studies on ecosystem research are closely tied to physiological and biochemical processes of microorganisms, plants and animals, emphasizing coevolved responses such as herbivory which are supported through strong programs such as chemical ecology. Systematics of organisms within arctic and subarctic systems is being studied to establish mechanisms that provide for maintenance of heterogeneity in members of isolated communities. The interest in man has largely related to anthropologic and archaeologic studies of native Alaskans (present and past) and to improvements in reindeer herd

management and productivity that benefit man in a largely natural system.

The institute is located in the Laurence Irving and the Arctic Health Research Building, and provides a vivarium, animal isolation facility, surgery and a variety of technical and instrumental facilities and services for coordinated and individual research. Special field sites include a 40-acre experimental biological reserve on campus and the Large Animal Research Station, housing breeding colonies of muskox, caribou and reindeer, adjacent to the campus, plus a reindeer research facility at Nome. The institute maintains the only major ecological research station in the Arctic, at Toolik Lake north of the Brooks Range. Research field camps at Eagle Summit, on alpine tundra, at Cantwell, near Denali National Park, and at Homer and Halibut Cove on the shores of Kachemak Bay provide a wide range of ecological diversity for specimen collection and research.

There is a staff of approximately 75 serving the institute. The faculty have joint appointments with instructional colleges and 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 Northern Engineering - Formerly known as the Engineering Experiment Station/Institute of Water Resources, INE is an interdisciplinary organization within the School of Engineering.

INE facilities are shared with the Research Section of the Alaska Department of Transportation and Public Facilities (which investigates many important practical research problems), the Alaska Department of Natural Resources (ADGGS), and several other academic departments of the university. Instruction within the School of Engineering includes accredited undergraduate programs in civil, mechanical and electrical engineering. The school also offers graduate level programs in civil, electrical, mechanical, arctic and environmental quality engineering, engineering and science management, plus interdisciplinary master's and doctoral programs (such as hydrology) tailored to the student's needs.

The Engineering Research Center (ERC) 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 technologies for more cost-effective rural airfields. ERC focuses its research on the special needs of Alaskans and other peoples of the North. Cooperation with other research institutes located on campus has provided important basic information to help seek practical solutions to problems facing Alaskans.

The Water Research Center (WRC) 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. WRC also provides a strong interdisciplinary environment for graduate students, giving them considerable breadth for tackling difficult problems.

The University of Alaska Transportation Center (UATC) helps Alaskans obtain useful information and training to meet local transportation needs. The program focuses on technology related to roads, bridges, airports, seaports, railroads and public transportation.

INE disseminates information through refereed publications, newsletters, reports, workshops and seminars.

Assistantships are available for well-qualified students to pursue advanced degrees in engineering and water resources.

Institute of Marine Science — The Institute of Marine Science was established in 1960 by the Alaska 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 conducting 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, ecological studies of the northern Bering Sea and Southern Chukchi Sea, 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 agency, industry and foundation grants to the institute.

Mineral Industry Research Laboratory — The Mineral Industry Research Laboratory was established by the 1963 Alaska 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 and hydrometallurgy of Alaskan ores, geology and mineral deposits of the state, placer mining and gold recovery, 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.

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.

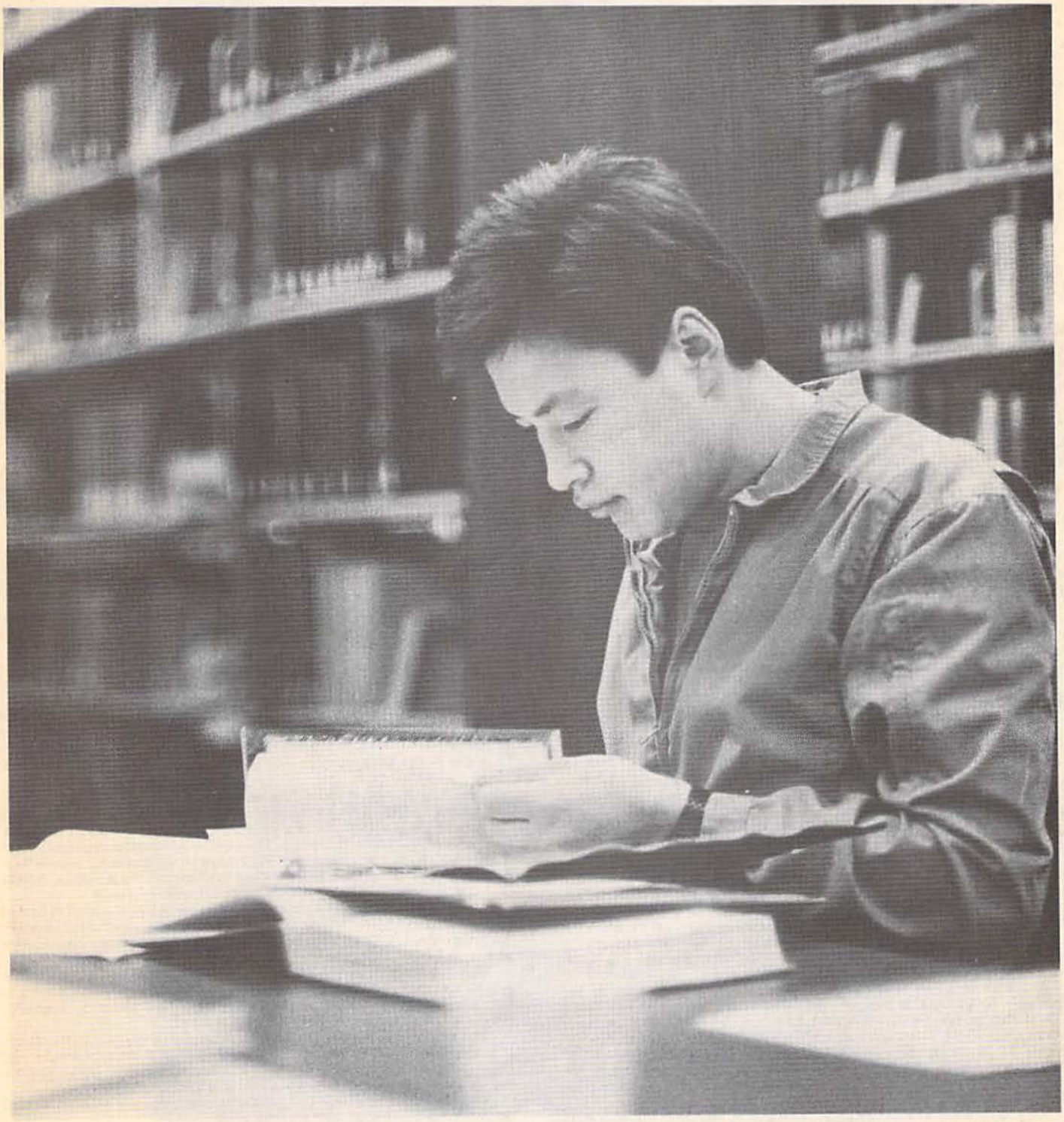
The Herbarium preserves and systematically stores plant specimens. It consists of over 112,000 specimens. These collections represent the United States, Scandinavia, Finland, Greenland, Canada, Japan and the Soviet Union, which provide data for comparative studies.

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

The 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 a approach developed by the project call "Community-Determined Film Making," in which the communities and individuals filmed play key roles in determining the content and direction of the films.



Wayne Attla, a journalism major from Hughes, Alaska, uses the Rasmuson Library's reference area for last-minute studying before final exams.

Van Kinnicutt, a senior mathematics major, took a few classes during the summer session, and enjoyed the famous Fairbanks summer weather.

Academic Organization

The four professional schools and three colleges at UAF offer degrees in 65 major areas, with a host of options, within many of the degree programs. 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.

The following pages contain a description of each school and college and the departments found within them. Department faculty and degrees offered are also listed.

College of Human and Rural Development

Gerald V. Mohatt, Dean

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.

Department of Behavioral Sciences and Human Services

Faculty

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

Degrees

College Student Personnel Administration, M.Ed.
Community Psychology, M.A.
Guidance and Counseling, M.Ed.
  Elementary
  Secondary
Human Services, B.A.
Psychology, B.A., B.S.
Social Work, B.A.
Sociology, B.A., B.S.

Department of Education

Faculty

Department Head and Associate Professor: William N. Parrett
Professor: Judith S. Kleinfeld, David M. Smith
Associate Professors: Stephen F. Grubis, David Hagstrom, Lillian P. Stinson
Assistant Professors: Lisa D. Delpit, Perry Gilmore, Barbara G. Harrison, Jerry M. Lipka*, Eric C. Madsen*, Clifford Michel*, Michael J. Oleksa, Richard E. Riedl, Kathleen P. Bennett*, Eber Hampton, Patricia A. Nelson.
Instructors: Perry T. Mendenhall*, William R. Pfisterer
*Field-based faculty.

Degrees

Education, B.Ed.
  Elementary
  Secondary
Education, B.T.
  Secondary
Education, Ed.S.
  Cross-Cultural Studies
  Public School Administration
Education, M.Ed.
  Cross-Cultural
  Curriculum and Instruction
  Educational Administration
  Language and Literacy

Department of Rural Development

Faculty

Department Head and Associate Professor: Patrick J. Dubbs
Professor: Raymond J. Barnhardt
Assistant Professor: Nicholas Flanders
Instructor: Richard A. Caulfield, Lary A. Schafer

Degrees

Rural Development, B.A.
  Applied Land Management
  Community Research and Cultural Documentation
  Local Government Administration
  Village Corporation Management
  Youth Organization

College of Liberal Arts

Anne D. Shinkwin, Dean

The primary mission of the College of Liberal Arts is to provide a broad liberal arts education to students at UAF whatever their area of specialization. The college includes disciplines in the social sciences, humanities, performing arts, mathematical sciences, as well as professional programs in journalism and broadcasting and physical education. Research efforts are in many directions but there is increasing emphasis on Alaskan studies, especially those related to public policy issues. A major college goal is to increase its national and international reputation in northern studies. Students are encouraged to participate in northern research projects and to take advantage of the many course offerings in the college that deal with the circumpolar north. College courses also emphasize the importance of literacy skills for all students in writing and oral communication and mathematics, and fosters an appreciation for the arts through active programs in art, music, and theater.

Undergraduate Degrees: Bachelor of arts in Yupik, Eskimo, Inupiaq Eskimo, Alaska Native studies, anthropology, art, English, geography and regional development, history, humanities, journalism, justice, foreign language, linguistics, mathematics, music, music education, northern studies, philosophy, physical education, political science, Russian studies, speech communication and theater. Bachelor of science in anthropology, applied statistics, computer science, geography, mathematics and physical education. Bachelor of music. Bachelor of fine arts in art.

Graduate Degrees: Master of arts in anthropology, English, Master of fine arts in English, Master of arts in teaching in English, history, mathematics, Master of science in computer science and mathematics. Doctor of philosophy in mathematics.

Department of Alaska Native Languages

Faculty

Chairman and Professor: Michael E. Krauss
Associate Professor: Steven Jacobson
Assistant Professor: Edna Maclean
Instructor: Eliza Jones

Degrees

Inupiaq Eskimo, B.A.
Yupik Eskimo, B.A.

Department of Alaska Native Studies

Faculty

Department Head and Assistant Professor: Bart Garber
Associate Professor: Michael Gaffney
Assistant Professors: J. Stephen Crosby, Patricia Kwachka

Degrees

Alaska Native Studies, B.A.

Department of Anthropology

Faculty

Department Head and Professor: Jean Aigner
Professors: Lydia T. Black, Anne D. Shinkwin, G. Richard Scott
Associate Professors: W. Roger Powers, Robert Jarvenpa
Assistant Professor: Linda J. Ellanna

Degrees

Anthropology, B.A., B.S., M.A.

Department of Art

Faculty

Department Head and Professor: Glen C. Simpson
Professors: L. Stanley Zielinski, Terence T. Choy, Arthur W. Brody
Associate Professor: Barbara Alexander
Assistant Professors: Kesler Woodward

Degrees

Art, B.A., B.F.A.

Department of Cross-Cultural Communications

Faculty

Department Head and Assistant Professor: Charlotte Basham
Assistant Professor: Ann Frentzen, Pat Kwachka
Instructor: Linda Haugen, Roland Wulbert

Department of English

Faculty

Department Head and Professor: Mary K. Baron
Professors: John W. Bernet, Alice L. Harris, John W. Morgan, David A. Stark
Associate Professors: Roy K. Bird, Joseph A. Dupras, Michael J. Schuldiner, Russell E. Stratton, Russell D. Tabbert, Cynthia L. Walker
Assistant Professors: Eric Heyne, Janis Lull, Leroy Perkins, Frank Soos

Degrees

Creative Writing, M.F.A.
English, B.A.
- Forms and Techniques of Writing Literature
- Teaching

English, M.A., M.A.T.

Department of Foreign Languages and Literatures

Faculty

Department Head and Assistant Professor: Vincent Pelletier
Professor: Wolf Hollerbach, John Koo
Associate Professor: Serge Lecomte
Assistant Professors: Karen Colligan-Taylor, Victoria J. Moessner, Nijole Rukas

Degrees

Foreign Languages, B.A.
- French
- German
- Russian
- Spanish

Department of Geography

Faculty

Department Head and Associate Professor: Roger W. Pearson
Professor: Donald F. Lynch
Assistant Professor: Kenneth A. Barrick

Degrees

Geography, B.A., B.S.

Department of History

Faculty

Department Head and Professor: Claus-M. Naske
Professor: John Whitehead
Associate Professor: Peter Cornwall, Carol Gold

Degrees

History, B.A., M.A.T.

Department of Journalism and Broadcasting

Faculty

Department Head and Associate Professor: David A. Hales, Dean M. Gottehrer
Associate Professors: Gerald E. Weaver, George M. Winford
Assistant Professors: Patrick J. Daley, Beverly A. James

Degrees

Journalism, B.A.
- Broadcast
- News-Editorial

Department of Library Science

Faculty

Department Head and Associate Professor: David A. Hales
Professor: Paul H. McCarthy

Associate Professors: Sherry L. Abrahams, Marvin W. Falk, Thomas J. Hassler, Tamara P.D. Lincoln, William H. Smith, Dennis J. Stephens, Julia H. Triplehorn, Sharon M. West
Assistant Professors: Brenda S. Artman, Marguerite Cornwall, Mark C. Goniwiecha, Pauline Gunter, Bruce Parham, Marvin Pollard, William S. Schneider, C. Eugene West
Instructor: Gretchen Lake

Department of Mathematics

Faculty

Department Head and Associate Professor: Clifton Lando
Professors: Jack Distad, Ronald W. Gatterdam, Gary Gislason, Thomas Head, Barbara Lando, Philip Van Veldhuizen
Associate Professors: Patricia Andresen, Michael Freedman, Robert Piacenza, Mitchell Roth, Walter Tape
Assistant Professors: James Burnham, Marguerite Hafen, John P. Lambert, Pham Xuan Quang, Susan Royer, Robert Sullivan, Dana Thomas, Steven Thompson

Degrees

Applied Statistics, B.S.
Computer Science, B.S., M.S.
Mathematics, B.A., B.S., M.S., M.A.T., Ph.D.

Department of Military Science

Faculty

Department Head and Professor: John Hite, Lt. Col.
Assistant Professors: Anthony Barnhill, Maj.
Instructor: Larry L. Kelsey, Sgt. Maj., Mellinger, Jeffrey J. SFC (p)

Degrees

Military Science/Army ROTC (minor only)

Department of Music

Faculty

Department Head and Associate Professor: David Stech
Professors: James Johnson, Thomas Johnston, Gordon B. Wright, Theodore DeCorso, Suzanne Summerville
Associate Professors: Kathleen Bulter-Hopkins, Bruno DiCecco, John Duff
Assistant Professors John Hopkins

Degrees

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

Department of Philosophy and Humanities

Faculty

Department Head and Associate Professor: Barbara Alexander
Professors: Walter Benesch, Rudolph Krejci
Assistant Professor: John Kooistra

Degrees

Humanities, B.A.
Philosophy, B.A.

Department of Physical Education

Faculty

Department Head and Assistant Professor: W. Tom Wells
Associate Professor: Theresa H. Tomczak
Assistant Professor: Nancy E. Frith

Degrees

Athletic Coaching (minor only)
Physical Education, B.A., B.S.

Department of Political Science

Faculty

Department Head and Assistant Professor: Kendall Stockholm
Professors: Gerald McBeath, Andrea Helms
Associate Professor: Gary Copus
Assistant Professors: James Gladden, Bart Garber

Degrees

Justice, B.A.
Political Science, B.A.

Department of Speech and Drama

Faculty

Department Head and Associate Professor: Robert Arundale
Professors: Lee H. Salisbury, Walter G. Ensign, Jr.
Associate Professor: Jayna Orchard
Assistant Professors: John Leipzig, Jonny Murdock, Ken Risch
Instructor: Marcia Stratton

Degrees

Speech Communication, B.A.
Theater, B.A.

College of Natural Sciences

Kolf Jayaweera, Dean

The College of Natural Sciences embraces seven areas of study: biology, fisheries, and wildlife; chemistry; geology and geophysics; marine sciences and limnology; physics; space physics; and atmospheric sciences. 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. Only Graduate programs are offered in space physics, atmospheric sciences, and marine sciences. Graduate programs take advantage of the outstanding research facilities relating to northern problems: the Geophysical Institute, the Institute of Arctic Biology, the Alaska Cooperative Wildlife Research Unit, the Alaska Cooperative Fishery Research Unit, and the Institute of Marine Sciences.

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 biology, zoology, fisheries biology, wildlife management, chemistry, geology, geophysics, oceanography, (biological, physical, geological, fisheries, and chemical), marine biology, botany; space physics, and atmospheric sciences. Master of Arts in Teaching in biological sciences, chemistry, geology, and physics. 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, fisheries, and wildlife management.

Department of Biology, Fisheries, and Wildlife

Faculty

Department Head and Professor: Robert B. Weeden
Professors: F. Stuart Chapin, Dale D. Feist, R. Dale Guthrie, David F. Murray, Gerald F. Shields, Ronald L. Smith, L. Gerard Swartz, Robert G. White, Stephen F. MaClean, Jr., Howard Feder.
Associate Professors: Carol F. Feist, L. Keith Miller, Mark W. Oswood.
Assistant Professors: W. Scott Armbruster, Brian M. Barnes, R. Terry Bowyer, John P. Bryant, John F. Fox, Edward C. Murphy, Kent E. Schwaegerle, James Stone Sedinger.
Instructor: Douglas L. Schamel.

Degrees

Biological Sciences, B.A., B.S.
Biology, M.S., M.A.T., Ph.D.
Botany, M.S.
Fisheries Science, B.S.
  Research
  Management
Fisheries Science, M.S.
Wildlife Management, B.S.
  Management Biology
  Research Biology
Wildlife Management, M.S., Ph.D.
Zoology, M.S., Ph.D.

Department of Chemistry

Faculty

Department Head and Professor: L. Claron Hoskins.
Professors: Daniel B. Hawkins, Paul R. Reichardt, David Shaw, Donald Button.
Associate Professors: Donald Lokken, Richard Stolzberg, Betty Anne Phillip, John Keller.
Instructor: Donald Gibler.

Degrees

Chemistry, B.A., B.S., M.A., M.S., M.A.T.

Department of Geology and Geophysics

Department Head and Professor: Don M. Triplehorn

Faculty

Geology Faculty

Professors: Richard C. Allison, Daniel B. Hawkins, David M. Hopkins, Donald L. Turner.
Associate Professors: Lewis H. Shapiro, Samuel E. Swanson, Ranier J. Newberry.
Assistant Professors: James E. Beget, R. Keith Crowder, Wes Wallace, Keith Watts.
Adjunct Professors: John Decker, John T. Dillon, Charles G. (Gil) Mull, Richard D. Reger, Thomas E. Smith, Milton A. Wiltse.

Geophysics Faculty

Coordinator and Associate Professor: Joan P. Gosink.
Professors: Nirendra Biswas, Juergen Kienle, Thomas E. Osterkamp, David B. Stone, Eugene M. Wescott.
Associate Professors: Hans Pulpan, William M. Sackinger, William J. Stringer.

Degrees

Earth Science, B.A.
Geology, B.S.
  Economic Geology
  General Geology
  Petroleum Geology
  Solid Earth Geophysics
Geology, M.A.T.
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.

Department of Marine Sciences and Limnology

Faculty

Department Head and Associate Professor: 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, A. Sathy Naidu.
Associate Professors: Raymond C. Highsmith, John J. Kelley, Zygmunt Kowalik, H. Joseph Niebauer, Tsuneo Nishiyama, Donald M. Schell.
Assistant Professors: Susan M. Henrichs, Walter R. Johnson, George W. Kipphut.

Degrees

Marine Biology, M.S.
Oceanography, M.S., Ph.D.

Department of Physics

Faculty

Department Head and Professor: John Morack.
Professors: S. Akasofu, Charles S. Deehr, William D. Harrison, Robert D. Hunsucker, Kolf Jayaweera, Joseph R. Kan, Manfred H. Rees, Juan G. Roederer, Glenn E. Shaw, Gulamabas G. Sivjee, Daniel W. Swift, Gunter E. Weller, Gerd Wendler, Lou-Chuang Lee.
Associate Professors: Vladimir Degen, David C. Fritts, Thomas J. Hallinan, John S. Murray, John V. Olson, Roger W. Smith, Brenton J. Watkins.
Assistant Professors: Sue Ann Bowling, Neal Brown, Koji Kawasaki.
Laboratory Instructor: John K. Petersen.

Degrees

Applied Physics, B.S.
Atmospheric Sciences, M.S., Ph.D.
Physics, B.A., B.S., M.S., M.A.T., Ph.D.
Space Physics, M.S., Ph.D.

School of Agriculture and Land Resources Management

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James V. Drew, Dean

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 instructional program offers a bachelor of science degree in natural resources management with options in natural resources, forestry, or agriculture, and a master of science degree in natural resources management. 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 Degree — Bachelor of science degree in natural resources management with options in natural resources, forestry, or 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.

Administration

Dean of the School of Agriculture and Land Resources Management, Director of the Agricultural and Forestry Experiment Station, and Professor of Agronomy (Fairbanks): 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

Instruction and Research

Fairbanks

Assistant Professor of Agricultural Engineering: Robert F. Cullum
Professor of Natural Resources: Alan C. Epps
Assistant Professor of Land Resources: John D. Fox
Assistant Professor of Regional and Land Use Planning: Thomas J. Gallagher*
Instructor of Forest Management and Extension Forester: Tony F. Gasbarro*
Assistant Professor of Plant Physiology: Marilyn Griffith
Assistant Professor of Horticulture: Patricia S. Holloway
Associate Professor of Animal Science: Fredric M. Husby
Associate Professor of Resource Management: Alan Jubenville
Visiting Associate Professor of Plant Ecology: Glenn Juday
Assistant Professor of Agriculture Education: Carla A. Kirts
Instructor of Agronomy: Charles K. Knight
Adjunct Associate Professor of Mycology: Gary A. Laursen
Associate Professor of Resource Management: Carol E. Lewis
Associate 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 Resource Management: Robert B. Weeden
Professor of Agronomy: Frank J. Wooding
Associate Professor of Economics: William G. Workman
Visiting Assistant Professor of Forest Soils: John A. Yarie
(Agricultural Research Service, U.S.D.A. personnel with experiment station)
Research Soil Scientist: Verlan L. Cochran
Research Weed Scientist: Jeffery S. Conn
Research Soil Physicist: Brenton Sharratt

Palmer

Assistant Professor of Animal Science: Leroy Ben Bruce
Associate 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

*Also on the staff of the Cooperative Extension Service.

Degrees

Natural Resources Management, B.S.
  Agriculture
  Forestry
Natural Resources Management, M.S.

School of Engineering

Vincent S. Haneman, Jr., P.E., Dean

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. To be of value to society the engineer frequently works as a member of a professional team often in positions 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. Engineering involving the additional problems of high latitude make the UAF graduate especially desirable. 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 computer, from very sophisticated PC's to extensive mainframes, is an integral part of the UAF engineering program from the freshman through graduate courses. The reduction to proof is carried forth by the school's Institute of Northern Engineering.

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. Video continuing engineering education provides remote location support of professionals throughout the State and country.

Department of Civil Engineering

Faculty

Department Head and Associate Professor: Nicolaas Coetzee, P.E.
Professors: Robert F. Carlson, P.E., William W. Mendenhall, P.E., Timothy Tilsworth, P.E.
Associate Professors: Jan Botha, 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., J. Leroy Hulsey, P.E.

Degrees

Arctic Engineering, M.S.
Civil Engineering, B.S., M.C.E., M.S.
Environmental Quality Engineering, M.S.
Environmental Quality Science, M.S.

Department of Electrical Engineering

Faculty

Department Head and Professor: John D. Aspnes, P.E.
Professors: John D. Aspnes, P.E., Robert P. Merritt, P.E., Thomas D. Roberts, P.E.
Associate Professors: Alexander H. Hills, Kenneth J. Kokjer, P.E., George Mulligan, P.E.
Adjunct Faculty: Robert D. Hunsucker, B. David Spell, P.E.

Degrees

Electrical Engineering, B.S., M.S., M.E.E.

Department of Engineering and Science Management

Faculty

Department Head and Professor: F.L. Bennett, P.E.

Degrees

Engineering Management, M.S.
Science Management, M.S.

Department of Mechanical Engineering

Faculty

Department Head and Professor: John P. Zarling, P.E.
Professors: Vincent S. Haneman, Jr., P.E., Ronald Johnson, P.E., James B. Tiedemann, P.E.
Associate Professors: Terry McFadden, P.E.
Assistant Professors: Deben K. Das, P.E., Jonah Y. H. Lee, Edgar G. Conley, P.E.

Degrees

Mechanical Engineering, B.S., M.S.

School of Management

Michael L. Rice, Dean

The School of Management offers programs of study which provide the foundation for professional careers in private or public, and in small or complex organizations. The undergraduate programs also provide the basis for graduate study leading to the opportunity for enhanced business or government careers, or for further training as a teacher or researcher in accounting, business administration, or economics. The graduate program is designed to provide management education for students with a wide variety of undergraduate degrees. The main objective of the school is to prepare literate, articulate and broadly educated business specialists, who are knowledgeable in fundamental economic laws, accounting and information systems, and who are 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 cultural values. All of these programs emphasize the problems and circumstances unique to Alaska including treatment of entrepreneurship, venture management, international business, regional economic development, regulation, financial institutions and markets, transportation, natural resource economics, travel industry management, and a comprehensive professional program in accounting.

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.

Admission to 300/400 level B.A. courses are limited to those students with junior standing who have completed all required 100 and 200 level courses in Accounting, Business Administration, Economics and Mathematics.

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.

Department of Accounting

Faculty

Department Head and Professor: M. Burton Oien
Professor: Milton A. Fink, Henry Wichmann
Associate Professors: Thomas E. Bartlett, E. Thomas Robinson
Assistant Professors: Ken Boze, Clifford T. Cox

Degrees

Accounting, B.B.A.

Department of Business Administration

Faculty

Department Head and Professor: Peter G. Biesiot
Professors: David B. Hoffman, William G. Phillips, Michael L. Rice
Associate Professors: Marvin J. Andresen, Ralph W. Nestor, John N. Taylor, Paul C. Taylor, Howard L. Zach
Assistant Professors: Andrew H. Hageman, Mary Lindahl, David Snepenger, Laura M. Milner, R. Kelley Pace
Adjunct Assistant Professor: Cory R. Borgeson
Lecturers: Richard W. Hompesch II, Bob C. Thomas

Degrees

Business Administration, B.B.A.
- Finance
- International Business
- Management
- Marketing
- Travel Industry Management

Business Administration, M.B.A.
Computer Information Systems (minor only)

Department of Economics

Faculty

Department Head and Associate Professor: Otis W. Gilley
Professors: Wayne C. Thomas, Richard J. Solie (Adjunct), J. Patrick O'Brien
Associate Professors: William Workman, Yeung-nan Shieh
Assistant Professors: Dennis Olson, Monica Thomas, Nancy Williams, Robert R. Logan

Degrees

Economics, B.A., B.B.A.
Resource Economics, M.S.

School of Mineral Engineering

Donald J. Cook, Dean

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).

Department of Mining and Geological Engineering

Faculty

Department Head and Associate Professor: R. C. Speck
Professors: D. R. Maneval; P. D. Rao; F. Skudrzyk
Associate Professors: S. L. Huang, R. C. Speck, N. I. Johansen, P.E.; M. Sengupta
Assistant Professors: S. Bandopadhyay; P. Metz; John S. Youtcheff, Jr.
Instructor: D. Walsh
Visiting Associate Professor: F. Letowski
Post Doctoral Fellow: H. K. Lin

Degrees

Geological Engineering, B.S., M.S.
Mineral Preparation Engineering, M.S.
Mining Engineering, B.S., M.S., E.M.

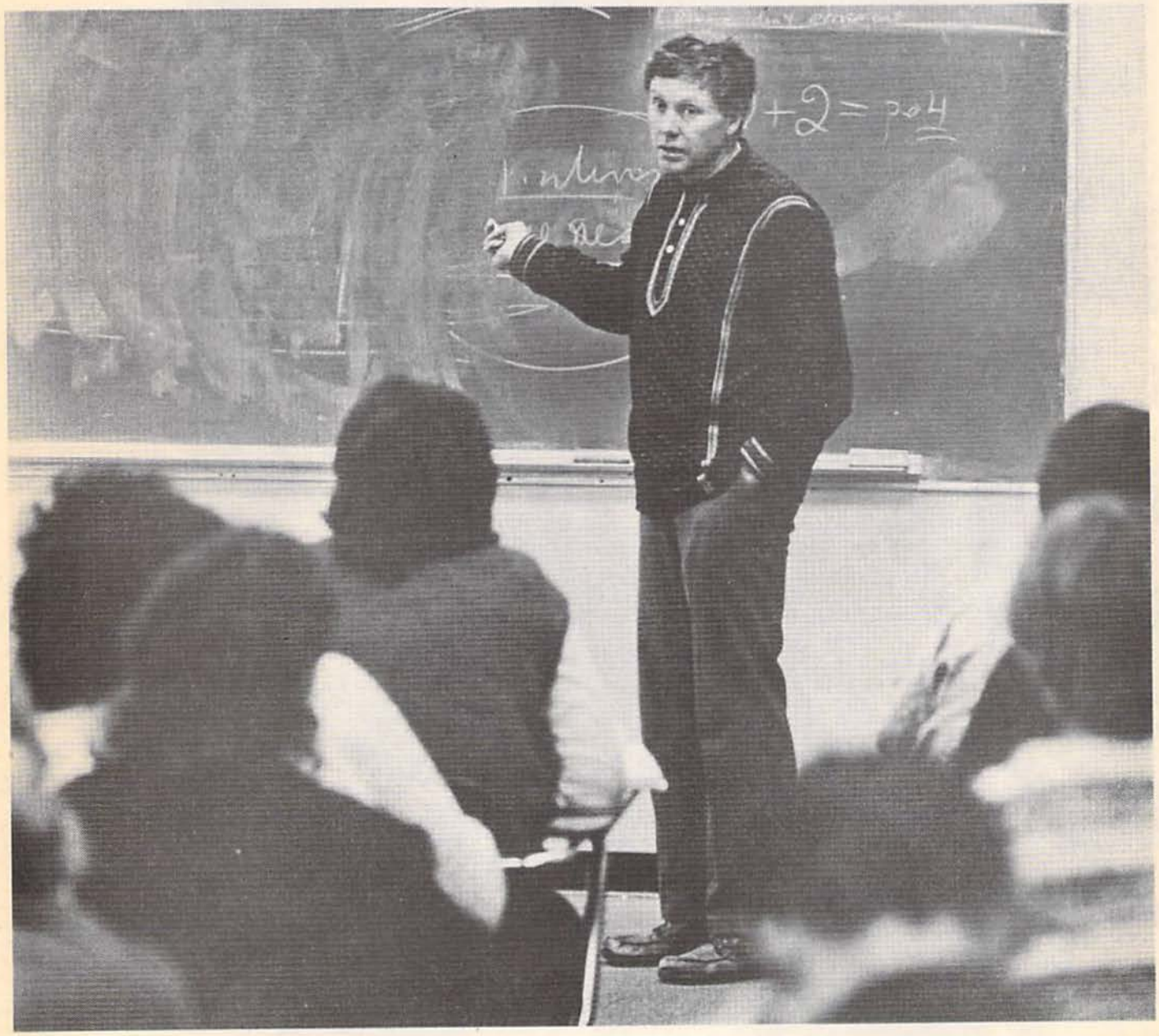
Department of Petroleum Engineering

Faculty

Department Head and Associate Professor: Russell D. Ostermann
Professor: G.D. Sharma
Assistant Professor: K. Dehghani, S. Godbole, D. Ogbe, E. Venkatesh, V. Kamath

Degrees

Petroleum Engineering, B.S., M.S.



Philosophy Professor Walter Benesch teaches logic to UAF students.

Robert Duncan, a seven-year-old from Metlakatla, Alaska, danced in the 14th Annual Festival of Native Arts. The Festival of Native Arts is held on the UAF campus each year in early spring.

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 Languages (minor only)
Alaska Native Studies, B.A.
Anthropology, B.A., B.S., M.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.
Community Psychology, M.A.
Computer Information Systems (minor only)
Computer Science, B.S., M.S.
Creative Writing, M.F.A.

Earth Science, B.A.
Economics, B.A., B.B.A.
Education, B.Ed.
- Elementary
- Secondary

Education, B.T.
- Secondary

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

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

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.
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.A.T.
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.
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, 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 option
- Forestry option

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.

Resource Economics, M.S.
Rural Development, B.A.
- Applied Land Management
- Community Research and Cultural Documentation
- 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.

Accounting

School of Management

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.

Faculty

Department Head and Professor: M. Burton Oien
Professors: Milton A. Fink, Henry Wichmann
Associate Professors: Thomas E. Bartlett, E. Thomas Robinson
Assistant Professors: Ken Boze, Clifford T. Cox

Requirements

Accounting — B.B.A. Degree
1. Complete general university requirements and B.B.A. degree requirements.
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 — Controllership and International 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	14
(of which a maximum of 9 credits may be taken in accounting, business administration, or economics.)	
4. 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

Alaska Native Languages

College of Liberal Arts

Minor only

There are 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 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 exist 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
Associate Professor: Steven Jacobson
Assistant Professors: Edna Maclean
Instructor: Eliza Jones

Requirements

MINOR in Alaska Native Languages:

A minor in Alaska Native languages requires 15 credits in Eskimo or Alaska Native language courses.

(See also "Inupiaq Eskimo" and "Yupik Eskimo.")

Alaska Native Studies

College of Liberal Arts

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 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 Assistant Professor: Bart Garber
Associate Professors: Michael Gaffney
Assistant Professors: J. Stephen Crosby, Patricia Kwachka

Requirements

Alaska Native Studies — B.A. Degree
1. Complete general university requirements and B.A. degree requirements.
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. 110 — History of Alaska Natives	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 — Narrative Art of Alaska Native Peoples (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

College of Liberal Arts

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

Department Head and Associate Professor: Jean S. Aigner
Professors: Lydia T. Black, G. Richard Scott, Anne D. Shinkwin
Associate Professors: Robert Jarvenpa, W. Roger Powers
Assistant Professor: Linda J. Ellanna

Requirements

Anthropology — B.S. or B.A. Degree
1. Complete general university requirements and B.A. or B.S. degree requirements.
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. 210 or 212 — 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 (research paper) 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.
2. A student must pass a written examination in anthropology. Each student is expected to take the examination during the second year in the program.
3. A graduate advisory committee is to be established beginning in the first semester of admission in the program. The committee of three UAF faculty must include at least two members of the department (in the subfield of student interest, if available) and the chair must be a member of the department as well as in the subfield of the student's interest. The student is expected to meet at least twice during each semester with the committee.
4. The need for a language requirement or a suitable substitute shall be determined by the student and his/her advisory committee.
5. Required courses which all graduate students enrolled in the program must complete with a grade of B or above are:

	Credits
Anth. 601 — Proseminar in Social/Cultural Anthropology	3
Anth. 611 — Proseminar in Archaeology	3
Anth. 621 — Proseminar in Physical Anthropology	3
5a. Anth. 600 — Anthropology Colloquium	0

All graduate students in residence are required to attend and participate in the Departmental colloquium.
6a. Thesis Track: Core requirements outlined above to be included in a program of at least 30 hours of study; 24 hours must be regular coursework (not research or thesis) and 21 of these must be at the 600 level, plus six (6) hours of thesis (Anth. 699).
6b. Non-Thesis Track with a Research Paper: at least 36 hours, including at least 30 hours of regular coursework (including the core requirements), with 24 of these at the 600 level. A maximum of six (6) hours may be devoted to research (Anth. 698). The student must complete a research paper in proper style which the advisory committee judges to be of publishable quality.
7. The student must have at least one course in statistics (which may be part of the undergraduate record).
8. All students must have fieldwork and laboratory experience appropriate to the discipline or subdiscipline.

Interdisciplinary Ph.D. Emphasizing Anthropology
Students may develop an interdisciplinary Ph.D. with an emphasis in several areas of anthropology: Alaskan archaeology; Quarternary studies; contemporary Alaska Native studies. For further information contact the Head of the Department of Anthropology and refer to information elsewhere in this catalog which deals with Interdisciplinary Degrees.

Applied Physics

College of Natural Sciences

Degree: B.S.
Minimum Requirements for Degree: 130 credits

Faculty

Department Head and Professor: Roger Sheridan
Professors: Charles S. Deehr, Robert D. Hunsucker, Kolf Jayaweera, Joseph R. Kan, Manfred H. Rees, Juan G. Roederer, Glenn E. Shaw, Gulamabas G. Sivjee, Daniel W. Swift, Gunter E. Weller, Gerd Wendler, Lou-Chuang Lee
Associate Professors: Vladimir Degen, David C. Fritts, Thomas J. Hallinan, John S. Murray, John V. Olson, Roger W. Smith, Brenton J. Watkins
Assistant Professors: Sue Ann Bowling, Neal Brown
Laboratory Instructor: John K. Petersen

Requirements

Applied Physics — B.S. Degree
1. Complete the general university requirements and B.S. degree requirements.
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.

Applied Statistics

College of Liberal Arts

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, Pham Xuan Quang, Dana L. Thomas, Steven K. Thompson

Requirements

Applied Statistics — B.S. Degree
1. Complete the general university requirements and B.S. degree requirements.*
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:
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.)

Arctic Engineering

School of 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.
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 or equivalent.

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.

Art

College of Liberal Arts

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: Glen C. Simpson
Professors: L. Stanley Zielinski, Terence T. Choy, Arthur W. Brody
Associate Professor: Barbara Alexander
Assistant Professors: Kesler Woodward, Catherine Zuelsdorf

Requirements

Art — B.A. Degree
1. Complete general university requirements and B.A. degree requirements.
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

Majors 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 only

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

MINOR in Asian Studies
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.

Athletic Coaching

College of Liberal Arts

Minor only
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.

Requirements

MINOR in Athletic Coaching

1. Complete the following required courses:	*Credits*
P.E. 411 — History and Philosophy of Sport and Physical Activity	3
P.E. 412 — Principles and Problems in Athletic Coaching	3
P.E. 421 — Physiology of Exercise	3
P.E. 432 — Biomechanics of Human 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.)

Atmospheric Sciences

College of Natural Sciences

Degrees: M.S., Ph.D.
Minimum Requirements for Degrees: M.S., 30 additional credits; Ph.D., — no fixed credits

Faculty

Department Head and Professor: Roger Sheridan
Professors: Charles S. Deehr, Robert D. Hunsucker, Kolf Jayaweera, Joseph R. Kan, Manfred H. Rees, Juan G. Roederer, Glenn E. Shaw, Gulamabas G. Sivjee, Daniel W. Swift, Gunter E. Weller, Gerd Wendler, Lou-Chuang Lee
Associate Professors: Vladimir Degen, David C. Fritts, Thomas J. Hallinan, John S. Murray, John V. Olson, Roger W. Smith, Brenton J. Watkins
Assistant Professors: Sue Ann Bowling, Neal Brown
Laboratory Instructor: John K. Petersen

Requirements

Atmospheric Sciences — M.S. Degree
1. Complete the general university requirements and the master's degree requirements.
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).

Atmospheric Sciences — Ph.D. Degree
1. Complete the general university requirements and Ph.D. requirements.
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 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

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

(See also "Space Physics".)

Biological Sciences

College of Natural Sciences

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

Department Head and Professor: Robert B. Weeden
Professors: F. Stuart Chapin, Howard Feder, Dale D. Feist, R. Dale Guthrie, Stephen F. MacLean, David F. Murray, Gerald F. Shields, Ronald L. Smith, L. Gerard Swartz, Robert G. White
Associate Professors: Carol F. Feist, L. Keith Miller, Mark W. Oswood
Assistant Professors: W. Scott Armbruster, Brian M. Barnes, R. Terry Bowyer, John P. Bryant, John F. Fox, Edward C. Murphy, Kent E. Schwaegerle, James S. Sedinger
Instructor: Douglas L. Schamel

Requirements

Biological Sciences — B.A. Degree
1. Complete the general university requirements and B.A. degree requirements.
2. Complete the following program (major) requirements:

Biology 105-106, 210, 271, 362, 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, 271, 362 and two of the following courses:
Biol. 210, 239, 305, 342.

3. Minimum credits required 130

Biological Sciences — B.S. Degree
1. Complete the general university requirements and the B.S. degree requirements in communications and social sciences/humanities.
2. Complete the following program (major) requirements:
Core Requirements: Biol. 105-106, 271, 342, 362, Bot. 239, Math 200 or 272, AS 301, Chem 105-106, 321-322, and 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 Sciences. At least 21 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.
Foreign Language — one collegiate year or 6 credits of social sciences and/or humanities beyond the general requirements for the B.S. degree.
a. For Biology Option complete the following requirements in addition to the core requirements: At least one course in physiology (Biol. 210 or Bot. 416) and 17 additional credits, including one course in zoology (Biol. 222, 305, 317, or 406).*
b. For Botany Option complete the following requirements in addition to the core requirements: At least one course each in: plant physiology (Bot. 416), zoology (Biol. 222, 305, 317, or 406), plant anatomy/morphology (Bot. 334), plant systematics, evolution and diversity (Bot. 331, Bot. 333 or Bot. 476) and plant ecology (Bot. 474). One additional upper division (300-400) level course in botany or biology (including but not restricted to Biol. 308, Bot. 331, 333, 475, 476, A.L.R. 313, 380, 411, or 451).*
3. Minimum credits required 130

*Students may petition to substitute with chemistry courses up to 7 credits in the B.A. program, 10 credits in the B.S. (Biology Option) program, or 4 credits in the B.S. (Botany Option) program, approved in advance, for the additional biology credits required for the degree.

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.

Biology

College of Natural Sciences

Degrees: M.S., M.A.T., Ph.D.
Minimum Requirements for Degrees: M.S. — 30 or more additional credits; Ph.D. — open

Faculty

Department Head and Professor: Robert B. Weeden
Professors: F. Stuart Chapin, Dale D. Feist, R. Dale Guthrie, David F. Murray, Gerald F. Shields, Ronald L. Smith, L. Gerard Swartz, Robert G. White, Stephen F. MacLean, Jr., Howard Feder
Associate Professors: Carol F. Feist, L. Keith Miller, Mark W. Oswood
Assistant Professors: W. Scott Armbruster, Brian M. Barnes, R. Terry Bowyer, John P. Bryant, John F. Fox, Edward C. Murphy, Kent E. Schwaegerle, James Stone Sedinger
Instructor: Douglas L. Schamel

Requirements

Biology — M.S. Degree
1. Complete the general university requirements and master's degree requirements.
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.

Biology — M.A.T. Degree
Persons interested in this degree program should see the head of the department.

Biology — Ph.D. Degree
See degree requirements.

Botany

College of Natural Sciences

Degree: M.S.
Minimum Requirements for Degree: M.S. — 30 additional credits

Faculty

Department Head and Professor: Robert B. Weeden
Professors: F. Stuart Chapin, Dale D. Feist, R. Dale Guthrie, David F. Murray, Gerald F. Shields, Ronald L. Smith, L. Gerald Swartz, Robert G. White, Stephen F. MaClean, Jr., Howard Feder
Associate Professors: Carol F. Feist, L. Keith Miller, Mark W. Oswood
Assistant Professors: W. Scott Armbruster, Brian M. Barnes, R. Terry Bowyer, John P. Bryant, John F. Fox, Edward C. Murphy, Kent E. Schwaegerle, James Stone Sedinger
Instructor: Douglas L. Schamel

Requirements

Botany — M.S. Degree
1. Complete the general university requirements and master's degree requirements.
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.

Business Administration

School of Management

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.

All majors must earn a "C" or better in all Common Body of Knowledge courses, department specific general requirements, major specific requirements, and specific math and statistics requirements.

Faculty

Department Head and Professor: Peter G. Biesiot
Professors: David B. Hoffman, William G. Phillips, Michael L. Rice
Associate Professors: Marvin J. Andresen, Ralph W. Nestor, John N. Taylor, Paul C. Taylor, Howard L. Zach
Assistant Professors: Andrew H. Hageman, Mary Lindahl, David Snepenger, Laura M. Milner, R. Kelley Pace
Adjunct Assistant Professor: Cory R. Borgeson
Lecturers: Richard W. Hompesch III, Bob C. Thomas

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).
2. Complete the following statistics requirements:

	Credits
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 — The Legal Environment of Business	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 — Business 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 areas:

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
Upper-division electives approved in writing 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
Upper-division electives approved in writing 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 Management	3
BA 436 — Consumer Behavior	3
BA 443 — International Marketing	3
BA 445 — Marketing Research	3
BA 483 — Marketing Management	3

Upper-division electives approved in writing 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 Development	3
BA 471 — Tourism Seminar	3

6. Minimum credits required 130

MINOR in Business Administration*:

Acct. 101 — Elementary Accounting	3
B.A. 101 — Introduction to Management Information Systems	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
	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 or Bachelor of Science 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, calculus, 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.
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 UAF 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, including calculus, 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. 611 — Principles of Economic Analysis	3
Acct. 602 — Financial Acct. Concepts for Administrators	3
B.A. 603 — The Process and Legal Environment of Management	3
B.A. 605 — Management Information Systems	3
B.A. 606 — Quantitative Analysis	3
B.A. 625 — Financial Management	3
B.A. 643 — Marketing Management	3
B.A. 608 — 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.

Chemistry

College of Natural Sciences

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 premedicine; 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: Donald Button, Daniel B. Hawkins, Paul R. Reichardt, David Shaw
Associate Professors: John Keller, 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.
2. Complete the following program (major) requirements:

	Credits
Chem. 105-106 — General Chemistry	8
Chem. 202 — Basic Inorganic	3
Chem. 212 — Chemical Equilibrium & Analysis	3
Chem. 213 — Quantitative Analysis Laboratory	1
Chem. 321-322 — Organic Chemistry	6
Chem. 324 — Organic Laboratory	3
Chem. 331-332 — Physical Chemistry	6
Chem. 433 — Analytical Instrumental Lab	3
Chem. 434 — Physical Instrumental Lab	3
Chem. 492 — Seminar (seniors)	2
CS 201 — Computer Programming or ES 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.
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:

*Chem. 402 — Inorganic Chemistry	3
*Chem. 412 — Instrumental Analytical Methods	3
*Chem. 498 — Research	4
*One additional 400 or 600 level chemistry course	3
3. Total Credits Required	130

Suggested Curriculum for a B.S. Degree in Chemistry:

First Year

Fall Semester	15 credits
Chem. 105 — General Chemistry I	4
Math. 200 — Calculus	4
Engl. 111 — Methods of Written Communication	3
Elective	4
Spring Semester	17 credits
Chem. 106 — General Chemistry II	4
E.S. or C.S. 201 — Comp. Tech./Comp. Programming	3
Math. 201 — Calculus II	4
Speech Communications Elective	3
Social Science/Humanities Elective	3

Second Year

Fall Semester	15 credits
Chem. 212 — Chemical Equilibrium and Analysis	3
Chem. 213 — Quantitative Analysis Laboratory	1
Math. 202 — Calculus III	4
Phys. 103 or 211 — General Physics	4
Engl. 213 — Intermediate Exposition	3
Spring Semester	17 credits
Chem. 202 — Basic Inorganic Chemistry	3
Chem. 321 — Organic Chemistry	3
Phys. 104 or 212 — General Physics	4
Social Science/Humanities Elective	3
Elective	4

Third Year

Fall Semester	16 credits
Chem. 322 — Organic Chemistry	3
Chem. 324 — Organic Laboratory	3
Chem. 331 — Physical Chemistry	3
Humanities/Social Science Elective	3
Electives	4
Spring Semester	17 credits
Chem. 332 — Physical Chemistry	3
*Chem. 412 — Instrument Analysis Methods	3
Chem. 433 — Analytical Instrumental Lab	3
Humanities/Social Science Elective	3
Electives	5

Fourth Year

Fall Semester	17 credits
*Chem. 402 — Inorganic Chemistry	3
Chem. 434 — Physical Instrumental Laboratory	3
Chem. 492 — Seminar	1
*Chem. 498 — Research	2
Social Science/Humanities Elective	3
Electives	5
Spring Semester	16 credits
*Other Advanced Chemistry	3
Chem. 492 — Seminar	1
*Chem. 498 — Research	2
Electives	10

Upon completing the recommended curriculum and fulfilling all general university requirements, the student will receive a baccalaureate degree certified by the American Chemical Society.

The electives must include at least 6 credits at the upper division level (to satisfy the UAF general degree requirements for 42 upper division credits).

Chemistry foundation courses may be used toward partial fulfillment of the natural science requirement for the B.S. degree with a major in Chemistry.

*Advanced courses in the physical or biological sciences or mathematics may be substituted with permission of the head of the Chemistry Department. However, the student will not receive an ACS-certified degree.

Chemistry — B.S. Degree with Biochemistry/Molecular Biology Option
1. Complete the general university requirements and B.S. degree requirements.
2. Complete the following program (major) requirements:

	Credits
Biol. 105-106 — Fundamentals of Biology	8
Biol. 342 — Microbiology	4
Biol. 361 — Cell Biology	4
Biol. 362 — Principles of Genetics	4
Chem. 105-106 — General Chemistry	8
Chem. 212 — Chemical Equilibrium & Analysis	3
Chem. 213 — Quantitative Analysis Laboratory	1
Chem. 321-322 — Organic Chemistry	6
Chem. 324 — Organic Laboratory	3
Chem. 331-332 — Physical Chemistry	6
Chem. 433 — Analytical Instrumental Laboratory or Chem. 434 — Physical Instrumental Laboratory	3
Chem. 451 — General Biochemistry	4 3
Chem. 452 — Biochemistry Laboratory	3
Chem. 492 — Seminar	1 2
Math. 200-201-202 — Calculus	12
Phys. 103-104 or 211-212 — General Physics	8
Major elective (approved by department head)	6
3. Total Credits Required	130

Suggested Curriculum for a B.S. Degree in Chemistry: with Biochemistry/Molecular Biology Option

First Year

Fall Semester	15 credits
Chem. 105 — General Chemistry I	4
Biol. 105 — Fundamentals of Biology I	4
Math. 200 — Calculus I	4
Engl. 111 — Methods of Written Comm.	3
Spring Semester	18 credits
Chem. 106 — General Chemistry II	4
Biol. 106 — Fundamentals of Biology II	4
Math. 201 — Calculus II	4
Speech Communications Elective	3
Elective	3

Second Year

Fall Semester	15 credits
Chem. 212 — Chemical Equilibrium and Analysis	3
Chem. 213 — Quantitative Analysis Laboratory	1
Chem. 321 — Organic Chemistry	3
Math. 202 — Calculus III	4
Phys. 103 or 211 — General Physics	4
Spring Semester	17 credits
Chem. 322 — Organic Chemistry	3
Biol. 342 — Microbiology	4

Phys. 104 or 212 — General Physics 4
Engl. 211 or 213 — Intermediate Exposition 3
Hum./Soc. Sci. Elective 3

Third Year

Fall Semester — *17 credits*
Chem. 324 — Organic Laboratory 3
Chem. 331 — Physical Chemistry 3
Chem. 451 — Biochemistry 3
Biol. 362 — Principles of Genetics 4
Hum./Soc. Sci. Elective 4

Spring Semester — *16 credits*
Chem. 332 — Physical Chemistry 3
Biol. 361 — Cell Biology 4
***Electives 6
Hum./Soc. Sci. Elective 3

Fourth Year

Fall Semester — *16 credits*
Chem. 433 — Analytical Instrumental Laboratory
or Chem. 434 — Physical Instrumental Laboratory 3
Chem. 492 — Seminar 1
Hum./Soc. Sci. Elective 3
***Electives 9

Spring Semester — *17 credits*
Chem. 452 — Biochemistry Laboratory 3
Chem. 492 — Seminar 1
Major Electives 6
Hum./Soc. Sci. Elective 3
***Elective 3

***9 of these credits must be 300 level or above.

Requirements for a Minor in Chemistry

A minor in chemistry requires 12 credits above the foundation courses (Chem. 105-106) 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.
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.

Civil Engineering

School of 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.

Faculty

Department Head and Associate Professor: Nicolaas Coetzee, P.E.
Professors: Robert F. Carlson, P.E.; William W. Mendenhall, P.E.; Timothy Tilsworth, P.E.
Associate Professors: Jan Botha, P.E.; William E. Fuller, P.E.; Lawrence Glaum, P.E., Warren W. Hanson, P.E., J. Leroy Hulsey, P.E., Douglas L. Kane, P.E., Thomas C. Kinney, P.E.

Requirements

Civil Engineering — B.S. Degree

1. Complete general university requirements.
2. Complete the following degree and program (major) requirements:

First Year

Fall Semester — *16 credits*
Engl. 111 — Methods of Comm 3
Math 200 — Calculus 4
E.S. 101 — Graphics 2
Chem. 105 — General Chemistry 4
Social Science/Humanities Elective 3

Spring Semester — *17 credits*
Speech Communication Elective 3
Math 201 — Calculus 4
C.E. 112 — Elementary Surveying 3
Chem. 106 — General Chemistry 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
E.S. 209 — Statics 3
Social Science/Humanities Elective 3

Spring Semester — *16 credits*
Math 302 — Differential Equations 3
Phys. 212 — General Physics 4
E.S. 210 — Dynamics 3
Geos. 261 — General Geology for Engineers 3
Social Science/Humanities Elective 3

Third Year

Fall Semester — *16 credits*
C.E. 334 — Properties of Materials 3
E.S. 301 — Engineering Analysis 3
E.S. 331 — Mechanics of Materials 3
E.S. 341 — Fluid Mechanics 4
C.E. 402 — Intro. to Transportation Engineering 3

Spring Semester — *17 credits*
E.S. 346 — Basic Thermodynamics 3
C.E. 344 — Water Resources Engineering 3
C.E. 326 — Intro. to Geotech. Engineering 4
C.E. 441 — Environ. Engineering 4
C.E. 431 — Structural Analysis 3

Fourth Year

Fall Semester — *17 credits*
C.E. 432 — Structural Design 3
E.S. 307 — Elem. of Electrical Engineering 3
Technical Elective** 3
Technical Elective** 3
Technical Elective** 3
Social Sciences/Humanities Elective 3

Spring Semester — *16 credits*
E.S.M. 450 — Economic Analysis and Operations 3
C.E. 438 — Design of Engr. Systems 3
Social Sciences/Humanities Elective 4
Technical Elective** 3
Technical Elective** 3
C.E. 400 — EIT Exam 0

*A student taking CE 433 and 434 will get credit for CE 432 and 4 credits of technical elective.

**Technical electives must include 12 credits of CE courses and 3 credits of technical courses and be approved in writing by the advisor.

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.

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, 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.

College Student Personnel Administration

College of Human and Rural Development

Degree: M.Ed.
Minimum Requirements for Degree: 36 additional credits

Faculty

Department Head and Professor: E. Clifford Brennen
Professors: John Turner
Associate Professors: Harris Shelton
Assistant Professors: James Cole, William Connor, Carol Diehl, Kenneth Green, Elmer Haymon, Cathy Sink, Richard Stenard

Requirements

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.
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 and Techniques 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)

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

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

Computer Information Systems

College of Liberal Arts

Minor only

The computer information systems minor is designed to permit students in bachelor of arts and bachelor of science 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:

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 or CS 201 Computer Programming	3
B.A. 220 — Basic Programming Languages or CS 202 Computer Programming	3
B.A. 310 — Management Information Systems	3
Acct. 316 — Accounting Information Systems	3
Total	21

Community Psychology

College of Human and Rural Development

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.

Faculty

Department Head and Professor: E. Clifford Brennen
Professors: Richard Katz, Gerald Mohatt, James Orvik
Associate Professor: John Booker
Assistant Professors: James Cole, William Connor, Carol Diehl, Kenneth Green, Victor Lieberman, Valerie Montoya, Cathy Sink

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) An application must include a personal statement of the applicant's purpose in seeking this degree.
d) 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
Psy./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 and Techniques of Individual Counseling	3
Psy. 661 — Cross-Cultural Counseling	3
Psy. 663 — General Assessment and Testing	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

Computer Science

College of Liberal Arts

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

Professors: Ronald W. Gatterdam, Thomas J. Head, Barbara M. Lando
Associate Professor: Mitchell Roth
Assistant Professors: Marguerite Hafen, Robert A. Sullivan

Requirements

Computer Science — B.S. Degree
1. Complete the general university requirements and B.S. degree requirements.
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:
Computer Science elective packages consist of the two mathematics courses from 2 above, plus the 9-11 elective package credits listed in 3 above. The package must be advisor approved. Below are sample packages for several specific areas of interest.

Software: Math 307, Math 314, C.S. 401, and two of C.S. 381, C.S. 411, C.S. 425, C.S. 442, C.S. 605, C.S. 621, C.S. 631
Hardware: Math 202, Math 314, C.S. 448, and two of C.S. 442, C.S. 622, C.S. 641, E.E. 443, E.E. 454
Theory: Math 307, Math 314, C.S. 451, and two of C.S. 411, C.S. 611, C.S. 651, Math 308
Applied Mathematics: Math 202, A.S. 301, Math 314, Math 310, Math 460, and one of Math 371, Math 408, Math 421, A.S. 401, A.S. 402, C.S. 661, C.S. 662

Business: Math 307, A.S. 301, C.S. 401, and two of Acct. 316, B.A. 310, Acct. 352, Acct. 472, Acct. 473
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.
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 examination based on the core material.

Creative Writing

College of Liberal Arts

Degree: M.F.A.
Minimum Requirements for Degree: 45 credits

Creative Writing — M.F.A. Degree
1. Complete the general university requirements and master's degree requirements.
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) (Extra 600-level course required if student does not take English 685) 3

d. Two form course 6

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) 6

g. 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 written comprehensive examination, based on a standardized reading list; examination to be taken no later than student's fourth semester of work.
5. Pass an oral defense of the thesis.

Earth Science

College of Natural Sciences

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.
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.

Economics

School of Management

Degrees: B.A., B.B.A.
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: Otis W. Gilley
Professors: J. Patrick O'Brien, Wayne C. Thomas, Richard J. Solie (Adjunct)
Associate Professors: Yeung-nan Shieh, William Workman
Assistant Professors: Robert R. Logan, Dennis Olson, Monica Thomas, Nancy Williams

Requirements

Economics — B.A. Degree
1. Complete general university requirements and B.A. degree requirements.
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
1. Complete general university requirements and B.B.A degree requirements. 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
B.A. 310 — Intermed. Management Information Systems *or*	
Acct. 316 — Accounting Information Systems	3
(For those students pursuing a double major in accounting and economics.)	
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 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

Education

College of Human and Rural Development

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; M.A.T. — minimum of 36 additional credits; Ed.S. — minimum of 30 credits beyond master's.

Faculty

Department Head and Associate Professor: William H. Parrett
Professors: Judith S. Kleinfeld, David M. Smith
Associate Professors: Stephen F. Grubis, David Hagstrom, Lillian P. Stinson
Assistant Professors: Kathleen P. Bennett*, Lisa D. Delpit, Perry Gilmore, Eber Hampton*, Barbara G. Harrison, Jerry M. Lipka*, Eric C. Madsen*, Clifford Michel*, Patricia A. Nelson, Michael J. Oleksa*, Richard E. Riedl
Instructors: 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. Students seeking a minor in education should consult with the faculty of the Department of Education during their freshman year to obtain specific requirements. Individuals who hold bachelor's degrees and wish to obtain certification should also consult with the faculty of the Department of Education.

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 1987 field center locations are as follows: Barrow, Bethel, Dillingham, 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 and enrollment in field-based courses are dependent upon admission to field-based programs and/or permission of instructors. 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 Center for Field Programs Coordinator, Department of Education, on campus.

Admission to Teacher Education

Any student wishing to become certified for teaching through the University of Alaska-Fairbanks must formally apply for admission and be accepted to the teacher education program. The application process should be initiated during enrollment in Ed. 201, or, for transfer students and in other special cases, at least during the semester prior to enrolling in any methods courses. **Acceptance to teacher education must occur before enrolling in education methods courses** *(Ed. 419, 423, and 402).* Continuation in teacher education is based upon the maintenance of satisfactory performance in all areas of the program.

Criteria for Admission to Teacher Education

The Admissions Committee will consider a variety of information, including the following:
A. Academic competence
B. Successful experiences in one or more of the following contexts:
1. public school classrooms

2. other settings with children
3. rural Alaska

C. Interpersonal, intercultural, and communication skills

D. Any and all additional standards set by the State

These factors will be assessed by faculty rating forms, letters of reference, university grade point average, and evaluations from University-sponsored practicum placements. An objective measure of basic skills will be administered for diagnostic purposes.

Requirements

Education — B.Ed. Degree

1. Complete general university requirements.

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
Speech Communication 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. 375 — The Exceptional Learner	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. and Curriculum Development	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 secondary 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.)

Ed. 490 — Curriculum Development	3
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

MINOR in Education — With or Without Teacher Credential Endorsement

Bachelor of arts and bachelor of science degree candidates may use the credential endorsement requirement as a minor in Education. STUDENTS MAY HAVE A MINOR IN EDUCATION WITHOUT STUDENT TEACHING BUT THEY MUST HAVE STUDENT TEACHING IF THEY WISH TO MEET CERTIFICATION REQUIREMENTS FOR TEACHING.

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.

MINOR in Elementary Education (WITH credential endorsement):

	Credits
Psy. 240 — Developmental Psychology in Cross-Cultural Perspective	3
Ed. 201 — Introduction to Education	3
Ed. 304 — Literature for Children	3
Ed. 330 — Diagnosis and Evaluation of Learning	3
Ed. 375 — The Exceptional Learner	3
Ed. 419 — Integrated Methods and Curriculum Development	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 Education	3
Ed. 350 — Communication in Cross-Cultural Classrooms	3
Ed. 380 — Cultural Influences in Education	3
Ed. 450 — Education and Cultural Transmission	3

MINOR in Elementary Education (WITHOUT credential endorsement):
Complete the Elementary Education minor requirements excluding Ed. 452 - Elementary Student Teaching.

MINOR in Secondary Education (WITH credential endorsement):

Psy. 240 — Developmental Psychology in Cross-Cultural Perspective	3
Ed. 201 — Introduction to Education	3
Ed. 330 — Diagnosis and Evaluation of Learning	3
Ed. 375 — The Exceptional Learner	3
Ed. 402 — Methods of Teaching in the Secondary School	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

One course from the following:

Ed. 345 — Sociology of Education	3
Ed. 346 — Structure of American Education	3
Ed. 350 — Communication in Cross-Cultural Classrooms	3
Ed. 380 — Cultural Influence in Education	3
Ed. 450 — Education and Cultural Transmission	3

MINOR in Secondary Education (WITHOUT credential endorsement):
Complete the Secondary Education minor requirements excluding Ed. 453 - Secondary Student Teaching.

Admission to Student Teaching
Retention in the teacher education program is contingent upon a second formal review prior to student teaching. This review will involve assessment of all criteria used for admission with the expectation that continued acceptable performance and/or appropriate growth will be noted in all areas. Applications for student teaching are due by October 1 or February 15 during the semester previous to the planned semester of student teaching. Placement for student teaching will proceed upon the determination that the application is acceptable.

Criteria 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.
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 in Cross-Cultural Perspective	3
Ed. 201 — Introduction to Education	3
Ed. 330 — Diagnosis and Evaluation of Learning	3
Ed. 375 — The Exceptional Learner	3
Ed. 402 — Methods of Teaching in the 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
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 UAF 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.
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 — 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 — Social Organization of Classrooms and Learning
Ed. 617 — Human Relations in Education
Ed. 618 — Higher Education: Basic Understandings
Ed. 630 — Curriculum Theory
Ed. 631 — Small Schools Curriculum Design
Ed. 633 — Computer Tools for Teachers: Word Processing and Telecommunications
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
Ed. 691 — Contemporary Issues in Education

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, Literacy and Learning
Ed. 621 — Cultural Aspects of Language Acquisition
Ed. 630 — Curriculum Theory
Ed. 631 — Small Schools Curriculum Design
Ed. 645 — Small Schools Institute
Ed. 660 — Educational Administration in Cultural Perspective
Ed. 691 — Contemporary Issues in Education

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 in Education
Ed. 618 — Higher Education: Basic Understandings
**Ed. 630 — Curriculum Theory or
**Ed. 631 — Small Schools Curriculum Design
**Ed. 650 — Organizational Behavior in Schools
**Ed. 651 — Large and Small School Management Processes
**Ed. 652 — Effective Schooling 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 Schools Curriculum Design
**Ed. 650 — Organizational Behavior in Schools
**Ed. 651 — Large and Small School Management Processes
**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
Ed. 691 — Contemporary Issues in Education

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.

Education — 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 school 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 Processes	3
Ed. 652 — Effective Schooling 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 Classrooms 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 Classrooms and Learning	3
Ed. 620 — Language, Literacy and Learning	3
Ed. 611 — Learning, Thinking and Perception in Cultural Perspective	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 Perspective
Electives: 600 level courses approved by candidate's committee

Interdisciplinary Studies — Students are encouraged to develop interdisciplinary degree programs through the Department of Education.

Electrical Engineering

School of Engineering

Degrees: B.S., M.E.E., M.S.
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 degree programs in electrical engineering are closely connected with research activities of the faculty. Research areas in electrical engineering emphasize high latitude problems. They include data communications, telecommunications, electromagnetic wave propagation, satellite communications, digital and physical electronics, computer and microcomputer applications including remote biomedical and environmental instrumentation, electric energy system analyses, electric power quality improvement, geomagnetic storm interaction with electric energy systems, system identification and simulation and digital signal processing.

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, P.E.
Professors: John D. Aspnes, P.E.; Robert P. Merritt, P.E.; Thomas D. Roberts, P.E.
Associate Professors: Alexander H. Hills; Kenneth J. Kokjer, P.E.; George Mulligan, P.E.
Adjunct Faculty: Robert D. Hunsucker, B. David Spell, P.E.

Requirements

Electrical Engineering — B.S. Degree
1. Complete the general university requirements.
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 — *17 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. 311 — Applied Engineering Electromagnetics 3
E.E. 331 — High Frequency Lab 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
Engl. 213 — Intermediate Exposition 3
E.E. 471 — Fundamentals of Automatic Control 4
Option I: Communications
E.E. 312 — Electromagnetic Waves and Devices 3
E.E. 332 — Electromagnetics Laboratory 1
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. 311 — Applied Engineering Electromagnetics 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
Option III: Computer Engineering
E.E. 303 — Electrical Machinery 4
E.E. 311 — Applied Engineering Electromagnetics 3
E.E. 331 — High Frequency Lab 1
E.E. 451 — Digital Signal Processing 3
E.E. 461 — Communications Systems 4

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 — M.E.E. Degree

The M.E.E. is structured to be a terminal degree for the practicing professional engineer.

Those entering the master of electrical engineering degree program should have completed a bachelor degree in electrical engineering. Students with bachelor degrees in other fields should work out a program to remove background deficiencies with their graduate committee.

Thirty-two credits of courses beyond the B.S. degree approved by a student's graduate committee must be completed, as well as general university requirements. At least 26 credits must be at the 600 level. Courses may be selected from electrical engineering and related fields. A research project is not required, although six credit hours of research may be allowed under special circumstances. The M.E.E. is structured for completion in two semesters. Candidates for the M.E.E. degree must pass the fundamentals of engineering examination made available by the Alaska State Board of Registration. Candidates must also pass a written and oral comprehensive examination in the final semester of study.

Electrical Engineering — M.S. Degree

Those entering the master of science in electrical engineering degree program should have completed a bachelor degree in electrical engineering. Students with bachelor degrees in other fields should work out a program to remove background deficiencies with their graduate committee.

Thirty credits of courses beyond the B.S. degree approved by a student's graduate committee must be completed, as well as general university requirements. At least 24 credits, including thesis and research must be at the 600 level. Courses may be selected from electrical engineering and related fields. A thesis must be completed, carrying a maximum of 12 credits.

Candidates for the M.S. degree in electrical engineering must pass the fundamentals of engineering examination made available by the Alaska State Board of Registration. Candidates must also pass a written and oral comprehensive examination in the final semester of study.

Engineering Management

School of Engineering

Degrees: M.S.
Minimum Requirements for Degrees: 30 credits (beyond a bachelor's degree in an engineering field)

The engineering management curriculum is designed for graduate engineers 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 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.

Candidates for the engineering management degree must hold a previous degree in an engineering discipline. (See also "Science Management".)

Faculty

Department Head and Professor: F. Lawrence Bennett, P.E.

Requirements

Engineering Management — M.S. Degree
1. Complete the general university requirements and master's degree requirements.
2. Complete the following degree and program (major) requirements:

a. Nine credits, including 9
1. ESM 601 — Engineers in Organizations
2. ESM 609 — Project Management
or
BA 643 — Marketing Management*
3. A third course chosen from
BA 643 — Marketing Management*
ESM 608 — Legal Principles for ESM
(with new description)
ESM 609 — Project Management
BA 661 — Human Resource Management*

b. Six credits, chosen from 6
ESM 605 — Engineering Economy
Acct. 603 — Financial Accounting Concepts for Administrators*
BA 625 — Financial Management*
If a student has had a course in engineering economy, Acct. 602 and BA 625 may be taken; otherwise, ESM 605 and Acct. 602 are required.

c. Six credits, chosen from 6
ESM 620 — Statistics for ESM
ESM 621 — Operations Research
BA 605 — Management Information Systems*

d. ESM 684 — Project: 3 credits 3

e. Nine credits of electives in the student's technical specialty 9

TOTAL 33

*No more than twelve (12) credits may be taken in the School of Management.

In addition to completing the 33 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 33 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.

English

College of Liberal Arts

Degrees: B.A., M.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 writing 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 of English offers three graduate degrees. The Master of Arts degree focuses on scholarly research in British and American literature. The Master of Arts in Teaching degree emphasizes the training of current or prospective secondary school teachers of literature and writing. The Master of Fine Arts degree centers on the writing of original, imaginative work in poetry, fiction, drama, and/or non-fiction. All three degree programs require students to take a large proportion of graduate literature courses and to engage in research and writing. Candidates for the Master of Arts in Teaching degree do not write theses; Master of Arts candidates write theses in literary scholarship. After being admitted to any one of the three degree programs, a graduate student may apply for one of the department's teaching assistantships.

Faculty

Department Head and Professor: Mary K. Baron
Professors: John W. Bernet, Alice L. Harris, John W. Morgan, David A. Stark
Associate Professors: Roy K. Bird, Joseph A. Dupras, Michael J. Schuldiner, Russell E. Stratton, Russell D. Tabbert, Cynthia L. Walker
Assistant Professors: Eric Heyne, Janis Lull, Leroy Perkins, Frank Soos

Requirements

English — B.A. Degree
A. Emphasis: Literature
1. Complete the general university requirements and B.A. degree requirements.
2. Complete the following program (major) requirements: 36 credits in English besides English 111 and English 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. Complete the following surveys of British and American Literature:

American Literature:
Engl. 306 — Survey of American Literature 3

British Literature:
Engl. 308 — Survey of British Literature: Beowulf to the Romantic Period 3
Engl. 309 — Survey of British Literature: Romantic Period to the Present 3

c. One course from the following:
Engl. 403 — American Renaissance
Engl. 404 — American Realism
Engl. 405 — British Writers of the 19th Century: Romantic Period
Engl. 406 — British Writers of the 19th Century: Victorian Period
Engl. 407 — English Writers of the 18th Century: Restoration and Neo-Classical Period
Engl. 408 — American Origins 3

d. Engl. 422 or 425 — Shakespeare 3

e. One course from the following:
Engl. 318 — Modern English Grammar
Engl. 462 — Applied English Linguistics
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: Writing
1. Complete the general university requirements and B.A. degree requirements.
2. Complete the following program (major) requirements: 36 credits in English besides English 111 and English 211 or 213 including:

Credits

a, b, c, and d as listed in the requirements for a major with emphasis on literature 21

e. Two courses from the following:
Engl. 444 — Fiction in Translation
Engl. 445 — 20th Century Drama: From Chekhov to Ionesco
Engl. 446 — Major Modern and Contemporary Poetry
Engl. 447 — 20th Century British Prose
Engl. 448 — 20th Century American Prose
Engl. 452 — The British Novel to 1900 6

f. Engl. 313 — Writing Non-Fiction Prose 3
Engl. 371 — Intermediate Creative Writing 3

g. One course chosen from 300-400 English Department Courses 3

3. Minimum Credits Required 130

C. Emphasis: Teaching
1. Complete the general university requirements and B.A. degree requirements.
2. Complete the following program (major) requirements: 36 credits in English besides English 111 and English 211 or 213, including:

Credits

a. Same as listed under a, b, and d for literature emphasis 18
b. Engl. 318 — Modern English Grammar 3
Engl. 472 — History of the English Language 3

c. Engl. 313 — Writing Non-Fiction Prose 3
Engl. 485 — Teaching Composition in the Schools 3
d. Two elective courses from the following 6
All 300-level English, Engl. 444, 445, 446, 447, 448, or 462
3. Minimum Credits Required 130

MINOR in English:
a, b, c, and d as listed in the requirements for a major with emphasis on literature 21

English — M.A. Degree
1. Complete the general university requirements and master's degree requirements.
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 written comprehensive examination based on a standardized reading list; examination to be taken no later than student's third semester of work. Examination will be held on the Saturday ending the fourth full week of classes.
5. Pass an oral defense of the thesis.

English — M.A.T. Degree
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.
1. Complete the general university requirements, master's degree requirements, and M.A.T. degree requirements.
2. Complete a minimum of 36 approved credits. Normally, at least two-thirds of the work (24 credits) will be in English courses, and no more than one-third (12 credits) will be in Education courses. Of the total, 24 credits must be at the 600 level. Of the English courses, at least 15 credits must be taken at UAF.

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 written comprehensive examination based on a standardized reading list and on content of Education courses taken to date; examination to be taken no later than student's fourth semester of work. Examination will be held on the Saturday ending the fourth full week of classes.

Environmental Quality Engineering and Science

School of Engineering

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.
Professors: Ronald A. Johnson, Timothy Tilsworth, P.E.

Requirements

Environmental Quality Engineering — M.S. Degree
Environmental Quality Science — M.S. Degree
1. Complete the general university requirements and master's degree requirements.
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 698 — Research/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 completed a formal course in computer programming, either basic or fortran, and introductory calculus, with a minimum grade of B. For those students not meeting this requirement, it will be treated as a deficiency.

Fisheries Science

College of Natural Sciences

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. Main access to the marine environment is in Prince William Sound and Cook Inlet.

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: Robert B. Weeden
Program Head and Associate Professor: James B. Reynolds
Professor: Ronald L. Smith
Associate Professor: Jacqueline D. LaPerriere, Mark W. Oswood
Assistant Professor: Willard E. Barber

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 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. 362 — 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	3

*or Math 200, 201, & 202 — Calculus

B. Electives:

Take one course from each of the following groups of courses:

	Credits
Group 1 (3-5 credits)	
Biol. 342 — Microbiology	4
Biol. 307 — Parasitology	3
Biol. 442 — Bacteriology and Immunology	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. 401 — Intro. to Exp. Design (4 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
**]-B 101 — Intro. to Mass Communication 3
**]-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 — Waterfowl and Wetlands Ecology and Management 3
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.
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.

Foreign Languages

College of Liberal Arts

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 Assistant Professor: Vincent Pelletier
Professors: Wolf Hollerbach, John Koo
Associate Professor: Serge Lecomte
Assistant Professors: Karen Colligan-Taylor, Victoria J. Moessner, Nijole Rukas

Requirements

Foreign Language — B.A. Degree
1. Complete the general university requirements.
2. Complete the B.A. degree requirements.
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 or 303 — 3 credits
202 — 3 credits 387 — 2 credits
288 — 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.

General Science

Interdisciplinary

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.
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. 212 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.
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.

Geography

College of Liberal Arts

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: Roger W. Pearson
Professor: Donald F. Lynch
Assistant Professor: Kenneth A. Barrick

Requirements

Geography — B.A. Degree

1. Complete the general university requirements and B.A. degree requirements.

UAF research reaches throughout the state

(Right)
A sounding rocket, launched from the Poker Flat Research Range, is on its way to the upper reaches of the atmosphere. The rocket will help Geophysical Institute scientists in their studies of the aurora borealis.

(Bottom)
The *R/V Alpha Helix*, operated by the Institute of Marine Science for the National Science Foundation, breaks through the Bering Sea ice edge.

(Facing Page)
Victoria, a muskox calf, rests in the shade of a birch tree at the Large Animal Research Station.

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, 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 25 and 26.
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.

MINOR in Geography:

A minor in geography requires 15 crdits in geography including Geography 101 or 103 and 205.

Geography and Regional Development

College of Liberal Arts

Degree: B.A.
Minimum Requirements for Degree: 130 credits

Requirements

Geography and Regional Development — B.A. Degree
1. Complete the general university requirements and B.A. degree requirements.
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

Geological Engineering

School of Mineral Engineering

Degrees: B.S., M.S.
Minimum Requirements for Degree: B. S. — 131 credits plus 6 credits field course; M.S. — 30-33 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.

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.

Faculty

Department Head and Associate Professor: R. C. Speck
Professors: D. R. Maneval, P. D. Rao, F. Skudrzyk
Associate Professors: S. L. Huang, N. I. Johansen, P.E., M. Sengupta
Visiting Associate Professor: F. Letowski
Assistant Professors: S. Bandopadhyay, P. Metz, John S. Youtcheff, Jr.
Instructor: D. Walsh
Post Doctoral Fellow: H. K. Lin

Requirements

Geological Engineering — B.S. Degree
1. Complete the general university requirements.
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**	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
Math. 302 — Differential Equations	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
G.E. 375 — Terrain Analysis	3
Geos. 321 — Sedimentology	3

Spring Semester	*16 Credits*
Geos. 314 — Structural Geology	4
G.E. 372 — Rock Engineering	3
Min. 370 — Rock Mechanics* or Technical Elective	3
A.S. 301 — Elementary Probability & Statistics	3
Social Science or Humanities 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. 471 — Remote Sensing for Engineering	3
Social Sciences or Humanities Elective**	7
Technical Elective***	2

Spring Semester	*15 Credits*
G.E. 405 — Exploration Geophysics	4
G.E. 420 — Subsurface Hydrology	3
Min. 408 — Mineral Valuation and Economics	2
G.E. 480 — Geological Engineering II	2
Technical Elective***	3

* 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 — Thesis Option

Thesis Option:

1. Complete the general university requirements and graduate degree requirements.

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
Total Minimum	30

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.

Geological Engineering — M.S. Degree — Non-Thesis Option

1. Complete the general university requirements and graduate degree requirements.

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
G.E. 471 — Remote Sensing for Engineers	3
Approved Technical Electives (minimum)	18
Report/Research	3-6
Total Minimum	33

Electives will consist of an approved course of study which will prepare the student for either exploration engineering or geotechnical engineering.

At least 24 credits, including report and/or research, must be at the 600 level.

Geology

College of Natural Sciences

Degrees: B.S., M.S., Ph.D.

Minimum Requirements for Degrees: B.S. — 130-136 credits including summer field courses; M.S. — 30 additional credits, including thesis; 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). 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

Professors: Richard C. Allison, Daniel B. Hawkins, David M. Hopkins, Donald L. Turner

Associate Professors: Rainer J. Newberry, Lewis H. Shapiro, Samuel E. Swanson

Assistant Professors: James E. Beget, R. Keith Crowder, Wes Wallace, Keith Watts

Adjunct Faculty: John Decker, John T. Dillon, Charles G. (Gil) Mull, Richard D. Reger, Thomas E. Smith, Milton A. Wiltse

Requirements

Geology — B.S. Degree

1. Complete the general university requirements.

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	3
Speech Communications Elective	3
Social Science (minimum of 3 credits) and Humanities (minimum of 3 credits), exclusive of 9 credit communications requirement	15
Mathematics	15 or 19
Geology options: 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	15
Geophysics Option: Math. 200, 201, 202-Calculus, 203-Finite Math., 302-Differential Equations	19
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 — Photogeology	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. 432 — Geology of Mineral Resources Lecture *or*
Geos. 432L — Geology of Mineral Resources Laboratory ..... 2 or 3
One of the following ..... 2 or 3
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 of the following: ..... 3 or 4
Geos. 418 — Basic Geophysics (3 credits)
Geos. 410 — Potential Methods in Geophysics (2 credits)
Geos. 412 — Electrical Methods in Geophysics (2 credits)
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 3
Geos. 410 — Potential Methods in Geophysics *or*
Geos. 412 — Electrical Methods in Geophysics 2
Geos. 470 — Petroleum Geology 3
Electives (professional & general) 15

Total 136

New requirements

4. For the 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 4
Geos. 351 — Field Geology* 4
Math. 421 — Applied Analysis I 4
Math. 422 — Applied Analysis II 4
Phys. 312 — Mechanics II 3
Phys. 331 — Electricity and Magnetism 3
Phys. 332 — Electricity and Magnetism 3
Geos. 411 — Seismic Exploration 3
Geos. 410 — Potential Methods in Geophysics 2
Geos. 412 — Electrical Methods in Geophysics 2
Geos. 418 — Basic Geophysics 3
Geos. 451 — Field Geophysics 2
Approved Geoscience Elective 4
Choose additionally at least 10 credits from the following:
E.E. 341 — Computer Organization *or*
E.E. 442 — Digital Systems Analysis 4
G.E. 405 — Exploration Geophysics 4
Geos. 112 — Historical Geology 3
Geos. 112L — Historical Geology Lab 1
Geos. 321 — Sedimentology 3
Geos. 322 — Stratigraphic Principles 4
Geos. 417 — Geochemistry 3
Geos. 422 — Remote Sensing 3
Geos. 430 — Statistics and Data Analysis 3
Pet.E. 302 — Formation Well Logging 2
Phys. 311 — Mechanics I 4
Phys. 313 — Thermodynamics 4
Approved Geoscience Elective 3
Electives (professional or general) to bring total to 130.

Total 130

*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.
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. The plan of study must include a minimum of two of the following courses:

Credits

Geos. 643 — Sandstone Depositional Environments 3
Geos. 644 — Advanced Stratigraphy 3
Geos. 645 — Advanced Carbonate Sedimentology 3
Geos. 646 — Seismic Stratigraphy 3
Geos. 647 — Advanced Sedimentology 3
Geos. 648 — Sedimentary Basin Analysis 3

Geology — M.A.T. Degree

Contact the head of the department for degree requirements.

Geology — Ph.D. Degree

1. Complete the general university requirements for graduate students and Ph.D. degree requirements.
2. Complete required program as arranged by conference with the graduate advisory committee.

Geophysics

College of Natural Sciences

Degrees: M.S., Ph.D.
Minimum Requirements for Degrees: M.S. — 36 credits (beyond a bachelor's degree), Ph.D. (open)

Faculty

Coordinator and Associate Professor: Joan P. Gosink
Professors: Syun-Ichi Akasofu, 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 Professor: Koji Kawasaki

Requirements

Geophysics — M. S. Degree*

1. Complete the general university requirements and master's degree requirements.
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.

Geophysics — Ph.D. Degree

1. Complete the general university requirements for graduate students and Ph.D. degree requirements.

2. Complete required program as arranged by conference with the graduate advisory committee.

Guidance and Counseling

College of Human and Rural Development

Degree: M.Ed.
Minimum Requirements for Degree: M.Ed. 42 additional credits

Faculty

Department Head and Professor: E. Clifford Brennen
Professors: John Turner, E. Clifford Brennen
Assistant Professors: James Cole, William Connor, Carol Diehl, Elmer Haymon, Victor Lieberman, Cathy Sink

Requirements

Guidance and Counseling — M.Ed.

The M.Ed. program in Elementary and Secondary Guidance and Counseling attempts to meet the demands of trained professional Counselors for the multicultural setting in rural and urban Alaska. The purpose of this program is to train experienced public school teachers at the graduate level in cross-cultural school counseling with specific training in the areas of counseling and consultation for educational, social, and vocational decisions. The program includes: the acquisition of knowledge in counseling, appraisal and research. In addition, a supervised practicum is required.

CERTIFICATION - Graduates may qualify for counseling endorsement 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 M.Ed. degree will meet the current academic requirements for Alaska certification. Teachers holding a Master's Degree and three years teaching experience at the appropriate level may be eligible for certification in Guidance and Counseling by completing a core of specialization courses. Any teacher wishing to become certified through the University of Alaska-Fairbanks must apply for admission, be accepted and complete 12 credit hours in residence in the program.

Guidance and Counseling — M.Ed.:

Admission Requirements
1. The equivalent of a University of Alaska Bachelor of Education degree or an Alaska teaching certificate with a minimum of 24 semester hours of education courses with an average g.p.a. of 3.00 (B). A copy of the valid teaching certificate must be included in the application.
2. Three years of satisfactory teaching experience in an accredited elementary or secondary level, verified by letter from the district office.
3. Three letters of recommendation: Professional practicing counselor, peer teacher, and a community individual.
4. Admission also may be contingent upon (1) satisfactory scores on various standardized tests and (2) a satisfactory personal interview conducted by counselor training faculty.

Minimum Requirements:
1. Complete a minimum of 42 credits in approved courses. This is a nonthesis program.
2. Pass a written qualifying examination in the foundation courses after completing 15 semester hours of an approved program.
3. Design and complete a counseling research project approved by the advisory committee with an oral comprehensive examination.
4. Complete the general graduate degree requirements.

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

Required Courses Elementary:
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 — Practicum I....3
Coun. 645 — Behavioral Consultation....3
Coun. 660 — Cross-Cultural Counseling....3
Coun. 698 — Research Project....3
SWK 306 — Social Welfare: Policies and Issues....3
Approved electives....9
(Recommended: ANS 475; Ed. 380, 601, 603; Soc. 304, 405, 408; Sp.C. 330)

Required Courses Secondary

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 and Techniques of Individual Counseling....3
Coun. 624 — Group Counseling....3
Coun. 628 — Life Span Development....3
Coun. 634 — Practicum I....3
Coun. 636 — Practicum II....3
Coun. 660 — Cross-Cultural Counseling....3
Coun. 698 — Research Project....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)

Guidance and Counseling - Certification Program:

Admission Requirements
1. A Master's Degree and current Alaska Teaching Certificate with a minimum of 24 hours of education courses with an average g.p.a. of 3.00 (B).
2. Transcripts and copy of teaching certificate.
3. Letter of verification of teaching experience from school district.
4. Three letters of recommendation: practicing counselor, peer teacher, community individual.

Minimum Requirements Elementary Endorsement (Certification)
1. Complete a minimum of 21 credits in approved courses.
2. Pass a qualifying examination in the foundation courses after completing 15 credits hours of an approved program.

Prerequisite courses to this program must appear in the Master Degree program. Graduate level courses in Educational Psychology or Learning Theory and Curriculum Theory foundation courses are included in the qualifying examination. Where the courses do not appear in the transcripts, these are deficits to be included in the certification program.

Required Courses
*Coun. 615 — Foundations of Guidance and Counseling....3
*Coun. 624 — Group Counseling....3
*Coun. 628 — Life Span Development....3
Coun. 634 — Practicum I....3
*Coun. 645 — Behavioral Consultation....3
Coun. 660 — Cross-Cultural Counseling....3
SWK 306 — Social Welfare: Policies and Issues....3

*Foundation courses for the qualifying examination after 15 semester hours in an approved program.

Minimum Requirements Secondary Endorsement (Certification)
1. Complete a minimum of 25 credits in approved courses.
2. Pass a qualifying examination in the foundation courses after completing 15 credit hours of an approved program.

Prerequisite courses to this program must appear in the Master Degree program. Graduate level courses in Educational Psychology or Learning Theory are foundation courses and are included in the qualifying examination. Where these courses do not appear in the transcripts, these deficits are to be included in the certification program.

Required Courses
*Coun. 615 — Foundations of Guidance and Counseling....3
*Coun. 623 — Principles and Techniques of Individual Counseling....4
*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

*Foundation courses for the qualifying examination after 15 semester hours in an approved program.

Health Sciences, See Other Academic Opportunities

History

College of Liberal Arts

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 Professor: Clause Naske
Professor: John Whitehead
Associate Professors: Carol Gold, Peter Cornwall

Requirements

History — B.A. Degree
1. Complete general university and B.A. degree requirements.
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 the M.A.T. degree. 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

College of Natural Sciences

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.

Faculty

Department Head and Associate Professor: Barbara Alexander
Instructor: Doris Bartlett

Requirements

Humanities — B.A. Degree
1. Complete the general university requirements and B.A. degree requirements.
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

Human Services

College of Human and Rural Development

Degree: B.A.
Minimum Requirements for Degree: B.A. — 121 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.

Faculty

Department Head and Professor: E. Clifford Brennen
Professors: E. Clifford Brennen, Richard Katz
Associate Professors: Gerald Berman, John Booker
Assistant Professor: Victor Lieberman

Requirements

Human Services — B.A. Degree
1. Complete the general university requirements and B.A. degree requirements.
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. 345 — Abnormal Psychology or Soc. 335 — Sociology of 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. 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 121

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

MINOR in Human Services:

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

Interdisciplinary Studies

Degrees: B.A., B.S., M.A., M.S., Ph.D.
Minimum Requirements for Degrees: B.A. — 130 credits; B.S. — 130 credits; M.A. and M.S. — 30 or more credits; Ph.D. — open

Undergraduate —

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 vice chancellor for Academic Affairs, 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 vice 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 vice chancellor, he/she 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 vice chancellor. Changes within the approved curriculum would be made only with the approval of this advisory committee.

Graduate —

Interdisciplinary proposals for graduate degrees must be submitted to the Director of Graduate Programs who will coordinate the review process similar to that described above for undergraduate proposals.

Inupiaq Eskimo

College of Liberal Arts

Degree: B.A.
Minimum Requirements for Degree: 130 credits

Faculty

Chairman and Professor: Michael E. Krauss
Associate Professor: Steven Jacobson
Assistant Professor: Edna Maclean
Instructor: Eliza Jones

Requirements

Inupiaq Eskimo — B.A. Degree

1. Complete the general university requirements and B.A. degree requirements.
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 ANS 320 — Language and Culture	3
Complete three of the following:	
Esk. 417 — (Additional) Adv. Inupiaq Eskimo	3
ANL 387 — Bilingual Methods and Materials	3
Anth. 242 — Native Cultures of Alaska	3
Hist. 110 — History of Alaska Natives	3
P.S. 263 — Alaska Native Politics	3
Engl. 349 — Narrative Art of Alaska Native Peoples (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
3. Minimum Credits Required	130

Journalism and Broadcasting

College of Liberal Arts

Degree: B.A.
Minimum Requirements for Degree: 130 credits

The curriculum in Journalism and Broadcasting offers a balance of professional and theory courses for majors and non-majors. Majors are able to take a variety of skills and theory courses while acquiring a strong liberal arts background. Non-majors, including those minoring in Journalism and Broadcasting, may choose from a wide selection of courses to meet their needs.

Besides gaining a solid academic background in the classroom, students get practical experience by working with media on and off campus. On campus, these include public television and public radio stations and a student-owned FM-stereo station. Print journalists work on the campus newspaper and on Alaska Today magazine. Off campus, students may choose from a variety of radio and television stations. Print journalists work at the Fairbanks Daily News-Miner.

Students in the department also have access to the department's state-of-the-art laboratory facilities. These include a computerized newswriting lab, typography lab, audio production lab, video editing lab and two photography labs.

The department and its two sequences, News-Editorial and Broadcast, are fully accredited by the Accrediting Council on Education in Journalism and Mass Communications.

Faculty

Department Head and Associate Professor: Dean M. Gottehrer
Associate Professors: Gerald E. Weaver, George M. Winford
Assistant Professors: Patrick J. Daley, Beverly A. James
Instructor: Paulette Walter

Requirements

Journalism — B.A. Degree

1. Complete the general university requirements and B.A. degree requirements.
2. Complete the following program (major) requirements:

A. Complete the following courses in journalism:

	16 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	3
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 240 — International Communications	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 340 — Approaches to the Study of Mass Communication 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 240 — International Communications 3
J-B 317 — Broadcast Journalism 3
*J-B 326 — Principles of Advertising 3
J-B 340 — Approaches to the Study of Mass Communication 3
J-B 372 — Instructional Television 3
J-B 407 — Programming and Production 3
J-B 415 — News/Documentary Television Production 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

College of Liberal Arts

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
Professor: Andrea Helms
Associate Professors: Gary Copus
Assistant Professors: Bart Garber, Jim Gladden, Marc Stier

Requirements

Justice — B.A. Degree
1. Complete the general university requirements and general requirements for the B.A. degree.
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.

Linguistics

College of Liberal Arts

Linguistics is the scientific study of language and covers a variety of subjects from theories of grammar and how we produce language to applications of linguistic knowledge in areas such as language teaching. The Linguistics Program offers undergraduate courses and seeks to give an overview of the discipline to make students aware of the many aspects of that uniquely human phenomenon, language.

Faculty

Program Head and Associate Professor: Lawrence D. Kaplan
Professors: John Koo, Michael E. Krauss
Associate Professor: James M. Kari
Assistant Professors: Charlotte Basham, Patricia B. Kwachka

Requirements

Linguistics — B.A. Degree
1. Complete the general university requirements.
2. Complete the B.A. degree requirements.
3. Complete the following program (major) requirements:

Credits
I. Background-related Requirements 15-18
Four semesters (or equivalent) of one foreign or Native language and two semesters of a second.
(It is recommended that at least one of the languages be other than an Indo-European language.) 12-16
Ling. 101 3

II. Major requirements 30
Complete the following Linguistics courses:
Ling. 318 — Intro. to Phonetics and Phonology 3
Ling. 320 — Intro. to Syntactic Theory 3
Ling. 350 — Historical Linguistics 3

Complete 7 of the following:
Ling. 410 — Second Language Teaching 3
Ling. 482 — Topics in Linguistics 3
(can be taken twice)
Ling. 216 — Languages of the World 3
Ling./Ed. 303 — Language and Literacy Development 3
Ling. 450 — Language Policy and Planning 3
ANL 215 — Alaska Native Languages 3
ANL 216 — Alaska Native Languages 3
ANS 320 — Language and Cultures 3
Engl. 318 — Modern English Grammar 3
Engl. 462 — Applied English Linguistics 3
Engl. 472 — History of the English Language 3
Sp.C. 320 — Communication and Language 3

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.~~

Marine Biology

College of Natural Sciences

Degrees: M.S.
Minimum Requirements for Degree: 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, A. Sathy Naidu, William S. Reeburgh, Thomas C. Royer, David G. Shaw
Associate Professors: Raymond C. Highsmith, John J. Kelley, Zygmunt Kowalik, H. Joseph Niebauer, Tsuneo Nishiyama, Donald M. Schell.
Assistant Professors: Susan M. Henrichs, Walter R. Johnson, George W. Kipphut

Requirements

Marine Biology — M.S. Degree
1. Complete the general university requirements and master's degree requirements.
2. Complete a minimum of 30 credits including MSL 610, MSL 611, MSL 650, three credits of MSL 692 and any one of MSL 620, 630, 650, 660 or Biol. 652. At least 24 credits, including thesis and/or research, must be at the 600 level.

(See also "Oceanography".)

Mathematics

College of Liberal Arts

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. — 30-35 additional credits.

The number of new fields in which professional mathematicians find employment grows continually. A variety of programs are offered by the Department of Mathematical Sciences for students majoring in mathematics. Options exist for those who are planning careers in industry, government, or education. The Department of Mathematical Sciences also offers degree programs in applied statistics and computer science which are described elsewhere in this catalog.

In addition to the major programs, the department provides a number of service courses in support of other programs within the university. Current and detailed information on mathematics degrees and course offerings is available from the department.

Faculty

Department Head and Associate Professor: Clifton Lando
Professors: Jack Distad, Ronald W. Gatterdam, Gary Gislason, Thomas Head, Barbara Lando, Philip Van Veldhuizen
Associate Professors: Patricia Andresen, Michael Freedman, Robert Piacenza, Mitchell Roth, Walter Tape
Assistant Professors: James Burnham, Marguerite Hafen, John P. Lambert, Pham Xuan Quang, Susan Royer, Robert Sullivan, Dana Thomas, Steven Thompson

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.
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.

Mathematics — M.A.T. Degree

1. Complete the general university requirements and master's degree requirements.
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.
2. Complete a curriculum of 30-35 credits of mathematics courses consisting of a core, electives and project/thesis. At least 24 credits, including thesis and/or research must be at the 600 level.
3. Upon completion of core course work, the candidate must pass an examination based on the core material.

Mathematics — Ph.D. Degree

1. Complete the general university requirements and Ph.D. requirements.
2. Complete the required program as arranged by conference with the candidate's graduate advisory committee.

Mechanical Engineering

School of 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.; Ronald Johnson, P.E.; James B. Tiedemann, P.E.
Associate Professors: Terry McFadden, P.E.
Assistant Professors: Deben K. Das, P.E.; Jonah Y. H. Lee, Edgar G. Conley, P.E.

Requirements

Mechanical Engineering — B.S. Degree

1. Complete the general university requirements.
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
Chemistry Elective	4
Humanities/Social Science Elective	3

Spring Semester	*17 credits*
Speech Comm. Elective	3
Math. 201 — Calculus	4
E.S. 201 — Computer Techniques	3
Chemistry Elective	3
Humanities/Social Science Elective	4

Second Year

Fall Semester	*17 credits*
Phys. 211 — General Physics	4
Math. 202 — Calculus	4
E.S. 209 — Statistics	3
M.E. 321 — Industrial Processes	3
Engl. 213 — Intermediate Exposition	3

Spring Semester	*16 credits*
Phys. 212 — General Physics	4
Math 302 — Differen. Equations	3
E.S. 210 — Dynamics	3
E.S. 346 — Thermodynamics	3
Humanities/Social Science Elec.	3

Third Year

Fall Semester	*16 credits*
E.S. 301 — Engineering Analysis	3
E.S. 307 — Elements of Electrical Engr.	3
E.S. 331 — Mechanics of Materials	3
E.S. 341 — Fluid Mechanics	4
Humanities/Social Science Elective	3

Spring Semester	*16 credits*
M.E. 302 — Mechanical Design I	4
M.E. 313 — Mech. Engr. Thermodyn.	3
M.E. 441 — Heat and Mass Transfer	3
E.S. 308 — Instrumentation and Measurement	3
Humanities/Social Science Elec	3

Fourth Year

Fall Semester	*16 credits*
M.E. 403 — Mechanical Design II	4
M.E. 415 — Thermal Systems Lab	2
M.E. Elective**	3
E.S. 334 — Elements Material Science Engr	3
Technical Elective*	3
Humanities/Social Science Elective	1

Spring Semester	*16 credits*
M.E. 487 — Design Project	3
M.E. 408 — Dynamics of Systems	3
M.E. Elective**	3
ESM 450 — Econ. Analysis and Operations	3
Approved Elective	4

*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.

2. Complete the following program (major) requirements:

	Credits
Mathematics Core	6-8
Select two of the following:	
Math. 421 — Applied Analysis I (4 credits)	
Math. 422 — Applied Analysis II (4 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 by the 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.

Medical Technology, See Other Academic Opportunities

Military Science

College of Liberal Arts

Minor only

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: John Hite, Lt. Col.
Assistant Professor: Anthony Barnhill, Maj.
Instructor: Jeffrey J. Mellinger, SFC (p)

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 provide 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.

Mineral Preparation Engineering

School of Mineral Engineering

Degree: M.S.
Minimum Requirements for Degree: 30-33 credits beyond Bachelor's degree.

Faculty

Department Head and Associate Professor: R. C. Speck
Professors: D. R. Maneval; P. D. Rao; F. Skudrzyk
Associate Professors: N. I. Johansen, P.E.; S. L. Huang; M. Sengupta
Visiting Associate Professor: F. Letowksi
Assistant Professors: S. Bandopadhyay; P. Metz; John S. Youtcheff, Jr.
Instructor: D. Walsh
Post Doctoral Fellow: H. K. Lin

Requirements

Mineral Preparation Engineering — M.S. Degree — Thesis Option

1. Complete the general university requirements and master's degree requirements.
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
Total	30

Mineral Preparation Engineering — M.S. Degree — Non-Thesis Option

1. Complete the general university requirements and graduate degree requirements.
2. Complete the following degree and program requirements:

MPR 601 — Froth Flotation	3
MPR 433 — Coal Preparation	3
Min. 621 — Advanced Mineral Economics	3
G.E. 431 — Applied Ore Microscopy	2
MPR 698 — Report/Research	3-6
Min./MPR 688 — Seminar	1
MPR 684 — Mineral Preparation Research	3
MPR 606 — Plant Design	3
*Electives (minimum)	12
Total Minimum	33

*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.

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Mining Engineering

School of Mineral Engineering

Degrees: B.S., M.S., E.M.

Minimum Requirements for Degrees: B.S. — 133 credits; M.S. — 30-36 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 Engineering Department, UAF.

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 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.

Faculty

Department Head and Associate Professor: R. C. Speck
Professors: D. R. Maneval; P. D. Rao; F. Skudrzyk
Associate Professors: N. I. Johansen, P.E.; S. L. Huang; M. Sengupta
Visiting Associate Professor: F. Letowksi
Assistant Professors: S. Bandopadhyay; P. Metz; John S. Youtcheff, Jr.
Instructor: D. Walsh
Post Doctoral Fellow: H. K. Lin

Requirements

Mining Engineering — B.S. Degree

1. Complete the general university requirements.
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 Engineering	2
Min. 104 — Mining Safety and Operations Lab	1
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	*15 Credits*
E.S. 331 — Mechanics of Materials	3
E.S. 341 — Fluid Mechanics	4
A.S. 400 — Statistics	3
E.S. 307 — Elements of Electrical Engineering	3
Geos. 432L — Geology of Mineral Resources Laboratory	2

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 six 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 — Thesis Option

1. Complete the general university requirements and graduate degree requirements.
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
Total	30

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
Total	30

*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

Mining Engineering — M.S. Degree — Non-Thesis Option

1. Complete the general university requirements and graduate degree requirements.
2. Complete the following program (major) requirements:

Min. 631 — Research Methods in Mineral Engineering	4
Min. 637 — Mine Systems Simulation or	

Min. 673 — Theoretical and Experimental methods in Rock Mechanics	3
Min. 621 — Advanced Mineral Economics	3
Approved Technical Electives**	15
Min. 688 — Graduate Seminar I	1
Min. 433 — Mining Access, Safety and Environmental Law	3
Min. 689 — Graduate Seminar II	1
Min. 698 — Report/Research	6
Total Minimum	36

At least 24 credits must be at the 600 level.

**See list of approved technical electives under item 4., thesis option above.

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 UAF 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 lead-times as outlined in Degree Requirements chapter, 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.

Music

College of Liberal Arts

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 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, Theodore DeCorso, Suzanne Summerville

Associate Professors: Kathleen Butler-Hopkins, Bruno DiCecco, John Duff

Assistant Professor: John Hopkins

Requirements

Music — B.A. Degree

1. Complete general university requirements and B.A. degree requirements.

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

*The applied music credit minimums defined for the major area of performance may be distributed over more than one instrumental area provided that the required level of competency is achieved for one instrument.

Music — B.M. Degree (Performance)

1. Complete the general university requirements.

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
[3]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.
**Mus. 190 — Recital Attendance	0
Mus. 253 — Piano Proficiency	0
3. Minimum credits required for degree	127

[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.
*The applied music credit minimums defined for the major area of performance may be distributed over more than one instrumental area provided that the required level of competency is achieved for one instrument.

**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 handbook for details.

Music — B.M. Degree
(Music Education — Secondary)
1. Complete the general university requirements.
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):

Mus. 405 — Secondary School Music Methods	3
Psy. 240 — Developmental Psychology	3
Ed. 201 — Introduction to Education	3
Ed. 330 — Diagnosis and Evaluation of Learning	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
3. Minimum credits required	136

*The applied music credit minimums defined for the major area of performance may be distributed over more than one instrumental area provided that the required level of competency is achieved for one instrument.

Music — B.M. Degree
(Music Education — Elementary)
1. Complete the general university requirements.
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. 201 — Introduction to Education	3
Ed. 304 — Literature for Children	3
Ed. 330 — Diagnosis and Evaluation of Learning	3
Ed. 419 — Integrated Methods and Curriculum Development	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
3. Minimum credits required	142

*The applied music credit minimums defined for the major area of performance may be distributed over more than one instrumental area provided that the required level of competency is achieved for one instrument.

Music — B.M. Degree
(Music Education—K-12)
1. Complete the general university requirements.
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*

Music 131-132 — Basic Theory	4
Music 133-134 — Basic Ear Training	4
**Music 190 — Recital Attendance	0
Music 221-222 — History of Music	6
Music 231-232 — Advanced Theory	6
Music 253 — Piano Proficiency	0
Music 351 — Conducting	3
Music 331 — Form and Analysis	3
Music 432 — Orchestration and Arranging	3
*Music 161-362 — Private Lessons	12
Music 315 — Music Methods and Techniques	10
Music 405 — Secondary School Music Methods	3
Music 309 — Elementary School Music Methods	3
Music 101, 203, 205, 211 — Large Ensembles	7

Required Education Courses: *Credits*

Psychology 240 — Developmental Psychology	3
Education 330 — Diagnosis and Evaluation of Learning	3
Education 201 — Introduction to Education	3
Education 407 — Reading Strategies for Secondary Teachers	3
Education 454 — Student Teaching	12

One course from the following:

Education 345 — Sociology of Education	3
Education 346 — Structure of American/Alaskan Education	3

Education 350 — Communication in Cross-Cultural Classrooms 3
Education 380 — Cultural Influences in Education 3
Education 450 — Education and Cultural Transmission 3

3. Minimum credits required 131

*The applied music credit minimums defined for the major area of performance may be distributed over more than one instrumental area provided that the required level of competency is achieved for one instrument.

A minor in Music requires 18 credits in Music to be selected from the following:
Music Theory, History and Appreciation (courses to be selected with approval of department head) 12
Music 151, 153, 161-462 4
Music 101, 203, 205, 211 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. *Performance:* A minimum of four credits of private lessons study at either the upper division or graduate level or two credits at either the upper division or graduate level and two credits of chamber music study, at either the upper division 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 appreciable amount of his scholarly career. Advisory examinations may be repeated until such time as the student has satisfactorily defined his area of specialization.

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.

Natural Resources Management

School of Agriculture and Land 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 program is designed for students desiring a career in resource management or in other fields in which knowledge of resource management is useful, students planning to proceed to advanced study, and students of many plans who wish to be better informed citizens about today's important resource issues. 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.

Faculty

Director of Instruction and Professor: Bonita J. Neiland
Professor: Robert Weeden
Associate Professor: Alan Ibbenville
Assistant Professor: John D. Fox, Thomas J. Gallagher, Anthony F. Gasbarro, Patricia S. Holloway, Carla Kirts

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.

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. 304 — Geomorphology	3
Min. 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. 211 — 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
Min. 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.

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
Bot. 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 — Intro. to 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.

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. 211 — Introduction to Agronomy & Horticulture	3
A.L.R. 312 — Intro. to 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
Bot. 239 — Plant Form and Function	4
Biol. 342 — Introductory Microbiology	4
Biol. 362 — 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.

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 — Planning Theory	3
A.L.R. 631 — 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.

Admission 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.
4. Brief statement of career goals, research area of particular interest, and why UAF seems suited to student needs.

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.

Northern Studies

Interdisciplinary

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 interdisciplinary.

The northern studies curriculum is centered around an interdisciplinary seminar, the Northern Studies Seminar, History 484, which is taken in the senior year. Students also must complete 10 courses, constituting a core program and select an additional two courses of their choice from the disciplines represented in the core curriculum. This program is currently being reviewed and may undergo curriculum revision during the academic year 1987-1988.

Faculty

Program Heads: Jean Aigner, Professor of Anthropology; Claus-M. Naske, Professor of History; Roger W. Pearson, Associate Professor of Geography

Professors: John W. Bernet, Lydia Black, Thomas Johnston, Michael Krauss, Don Lynch, Anne Shinkwin

Associate Professors: Michael Gaffney, Larry Kaplan, James Kari, Steve Jacobson, Robert W. Jarvenpa, Roger Powers, Cynthia L. Walker

Assistant Professors: Kenneth Barrick, Steve Crosby, Linda Ellanna, Bart Garber, Patricia Kwachka, Edna MacLean

Requirements

Northern Studies — B.A. Degree

1. Complete general university requirements and B.A. degree requirements.
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. 240 — Native Peoples 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 to 1854	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	4
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

Oceanography

College of Natural Sciences

Degree: M.S., Ph.D.
Minimum Requirements for Degree: M.S. — 30 credits; Ph.D. (open)

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, A. Sathy Naidu, William S. Reeburgh, Thomas C. Royer, David G. Shaw

Associate Professors: Raymond C. Highsmith, John J. Kelley, Zygmunt Kowalik, 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.
2. Complete a minimum of 30 credits including MSL 620, 630, 650 and 660 (or equivalents) except that fisheries oceanographers will take MSL 640 and any three of the above courses. All oceanographers will complete three credits of MSL 692. At least 24 credits, including thesis and/or research, must be at the 600 level.
3. Field experience aboard an oceanographic research vessel must be demonstrated by oceanography majors.

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.

(See also, "Marine Biology")

Petroleum Engineering

School of Mineral Engineering

Degrees: B.S., M.S.
Minimum Requirements for Degrees: B.S. — 133 credits; M.S. — 30-33 additional credits.

Petroleum engineering at UAF 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 Associate Professor: Russell D. Ostermann
Professor: G.D. Sharma
Assistant Professors: K. Dehghani, S. Godbole, V. Kamath, D. Ogbe, E. Venkatesh

Requirements

Petroleum Engineering — B.S. Degree

1. Complete the general university requirements.
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 — Thesis Option

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. Core Courses:	*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
Total 30

Petroleum Engineering — M.S. Degree — Non-Thesis Option
All of the requirements for the M.S. Thesis Option must be met except that the thesis requirements and credits are replaced with 6 additional credits of Petroleum Engineering coursework and submission of an engineering design report for 3 credits.

1. General Requirements: (a) The student must complete the general university requirements and master's degree requirements: (b) the student must complete at least 30 semester units of course work and a minimum of 3 credits in an engineering design report approved by the student's committee; (c) the student must earn a satisfactory score on a written comprehensive exam.

Credits

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. See A under the thesis option for a listing of these courses 12
In addition, 3 hours of advanced level mathematics and 3 hours of geology elective must be completed. Course selection will be subject to the approval of the student's committee 6
Four additional petroleum engineering electives will be required from the list of courses in "C" under the thesis option 12

Complete the following:
Pet.E. 698 — Engineering Project 3
Total 33

Philosophy

College of Liberal Arts

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 Associate 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.
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

College of Liberal Arts

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 Assistant Professor: W. Tom Wells
Associate Professor: Theresa H. Tomczak
Assistant Professor: Nancy E. Frith

Requirements

Physical Education — B.A. or B.S. Degree
1. Complete the general university requirements and B.A. or B.S. degree requirements.
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 or
Math 161 — Algebra for Business and Economics or
Math 171 — Mathematics for Life Sciences 3

3. Complete the following program (major) requirements:
Required Courses (22 Credits)
P.E. 205 — Introduction to the Human Movement Sciences 2
P.E. 232 — Analysis of Human Movement 3
P.E. 246 — Advanced First Aid 3
P.E. 316 — Motor Development 3
P.E. 405 — Concepts and Design of Physical Fitness Activities 2
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 8 credits)
For Elementary, Secondary, or K-12 Teaching Certification, students are required to complete one winter sport, one individual sport, one team sport, and five electives from the 200 fundamentals series.
P.E. 211 — Fundamentals of Softball 1
P.E. 212 — Fundamentals of Basketball 1
P.E. 213 — Fundamentals of Ice Sports 1

P.E. 214 — Fundamentals of Snow Sports 1
P.E. 215 — Fundamentals of Volleyball 1
P.E. 216 — Fundamentals of Rhythms 1**
P.E. 217 — Fundamentals of Recreational Activities 1**
P.E. 218 — Fundamentals of Soccer 1
P.E. 219 — Fundamentals of Aquatics 1
P.E. 220 — Fundamentals of Wrestling 1
P.E. 221 — Fundamentals of Gymnastics 1**
P.E. 222 — Fundamentals of Track and Field 1**

Elective Courses (select a minimum of 4 courses.)
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 2
P.E. 310 — Techniques in Teaching Folk and Square Dance 1

Elective Courses (select a minimum of 7 credits)
P.E. 317 — Motor Learning 3
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*

4. Minimum credits required 130

*Required by the Physical Education Department for those majors who wish to be considered for Elementary, Secondary or K-12 Teaching Certification.
**Required for K-12 Certification.

Elementary or Secondary Teaching Certification:
In addition to the 22 required, 8 elective credits from the 200 (Fundamentals) series, and 4 elective classes from the 300-310 series, students working toward teacher certification with the B.S. or B.A. in Physical Education must complete:
P.E. 321 — Practicum in Physical Education 1
P.E. 327 — Movement Activities for Children 2
P.E. 406 — Methods and Materials in Teaching P.E. 3
P.E. 425 — Administration of P.E. and Athletics 3
P.E. 442 — Measurement and Evaluation in Physical Education 3
Total 12

AND the required courses from the Education Department.

K-12 Teaching Certification:
In addition to the 22 required credits, 8 elective credits from the 200 (Fundamentals) series, and 4 elective classes from the 300-310 series, students working toward K-12 teacher certification with the B.S. or B.A. in Physical Education must complete:
P.E. 306 — Techniques in Teaching Creative Dance 1
P.E. 307 — Techniques in Camping and Outdoor Recreation 1
P.E. 321 — Practicum in Physical Education 2*
P.E. 327 — Movement Activities for Children 2
P.E. 406 — Methods of Teaching Physical Education 3
P.E. 411 — Sports and Physical Activity in American Society 3
P.E. 425 — Administration of P.E. and Athletics 3
P.E. 442 — Measurements and Evaluation in Physical Education 3
*Students are required to complete one semester (1 credit) in an approved practicum with elementary school children and one semester (1 credit) of an approved practicum on campus.

AND the following courses required by the Department of Education for certification:
Psy. 240 — Developmental Psychology in Cross-Cultural Perspective 3
Ed. 201 — Introduction to Education 3
Ed. 330 — Diagnosis and Evaluation of Learning 3
Ed. 407 — Reading Strategies for Secondary Teachers 3
Ed. 454 — 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

MINOR in Physical Education:
For a minor in P.E. for a B.A. Degree, complete 18 approved credits in Physical Education at the 200-level or above.

Physics

College of Natural Sciences

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 physics department is responsible for the Physics, Space Physics, Atmospheric Sciences, and the General Science programs.

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 provides a solid foundation in general physics with emphasis on its experimental aspects. Furthermore, opportunity is given to the physics student to study areas in applied physics such as atmospheric physics, space physics and engineering physics. A student completing this curriculum should be prepared for careers in education and industry, and for advanced work in the fields of physics, applied physics and related sciences.

Graduate Program — Graduate work is offered in various areas of physics and applied physics including many of the research areas found at the UAF Geophysical Institute. The research program of the Geophysical Institute currently emphasizes investigations of auroral, ionospheric, magnetospheric and space plasma physics, the physics and chemistry of the upper and middle atmosphere, radio wave propagation and scattering, solar-terrestrial relations, and polar meteorology.

A graduate student may designate his/her major field as physics, space physics or atmospheric sciences. He/she will pursue his/her studies under the supervision of an advisory committee which will advise on the course of study to be followed.

Faculty

Department Head and Professor: Roger Sheridan
Professors: Charles S. Deehr, Robert D. Hunsucker, Kolf Jayaweera, Joseph R. Kan, Lou-Chuang Lee, Manfred H. Rees, Juan G. Roederer, Glenn E. Shaw, Gulamabas G. Sivjee, Daniel W. Swift, Gunter E. Weller, Gerd Wendler
Associate Professors: Vladimir Degen, David C. Fritts, Thomas J. Hallinan, John S. Murray, John V. Olson, Roger W. Smith, Brenton J. Watkins
Assistant Professors: Sue Ann Bowling, Neal Brown
Laboratory Instructor: John K. Petersen

Requirements

Physics — B.A. Degree
1. Complete the general university requirements and B.A. degree requirements.
2. Complete the following program (major) requirements:
Complete the foundation courses: *Credits*
Phys. 113 — Concepts of Physics 1
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

Physics — B.S. Degree
1. Complete general university requirements and B.S. degree requirements.
2. Complete the following program (major) requirements:
Math. 200-201-202, 302 and 9 additional credits at the 300-level or above.
Phys. 113, 211-212, 213, 311-312-313, 331-332, 411-412, 381, 382, 445 and 462.

3. Minimum credits required 130

Suggested Curriculum for B.S. Degree

First Year
Fall Semester *16 credits*
Engl. 111 — Methods of Written Communication 3
Math. 200 — Calculus 4

Chem. 105 — General Chemistry 4
Biol. 105 or Geol. 101 4
Phys. 113 1

Spring Semester — *18 credits*
Speech Communication Elective 3
Phys. 211 — General Physics 4
Math. 201 — Calculus 4
Chem. 106 — General Chemistry 4
E.S. 201 — Computer Techniques 3

Second Year
Fall Semester — *18 credits*
Math. 202 — Calculus 4
Phys. 212 — General Physics 4
Engl. 211 — Intermediate Exposition with Modes of Literature
or Engl. 213 — Intermediate Exposition 3
Geol. 101 or Biol. 105 4
Humanities/Social Science elective 3

Spring Semester — *16 credits*
Math 302 — Differential Equations 3
Phys. 213 — Elementary Modern Physics 3
Humanities/Social Science electives 6
Math. 314 — Linear Algebra 3
Free electives 1

Third Year
Fall Semester — *16 credits*
Math. 421 — Applied Analysis I 4
Phys. 311 — Mechanics 4
Phys. 331 — Electricity and Magnetism 3
Phys. 381 — Physics Laboratory 2
Humanities/Social Science electives 3

Spring Semester — *16 credits*
Math. 422 — Applied Analysis II 4
Phys. 312 — Mechanics 4
Phys. 332 — Electricity and Magnetism 3
Phys. 382 — Physics Laboratory 2
Humanities/Social Science electives 3

Fourth Year
Fall Semester — *16 credits*
Phys. 411 — Modern Physics 4
Phys. 313 — Thermodynamics 4
Phys. 462 — Optics 4
E.S. 307 — Elements of Electrical Engineering 3
Free elective 1

Spring Semester — *16 credits*
Phys. 412 — Modern Physics 4
Phys. 445 — Solid State Physics 3
E.S. 308 — Instrumentation and Measurement 3
Free electives 6

A minor in Physics requires 12-16 credits.

Physics — M.A.T. Degree
See the head of the department for information.

Physics — M.S. Degree
1. Complete the general university requirements and master's degree requirements.
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 — Ph.D. Degree
1. Complete the general university requirements and Ph.D. requirements.
2. Complete required program as arranged by conference with the graduate advisory committee.

Political Science

College of Liberal Arts

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 Assistant Professor: Kendall Stockholm
Professors: Andrea Helms, Gerald McBeath
Associate Professor: Gary Copus
Assistant Professors: Marc Stier, Bart Garber, James Gladden

Requirements

Political Science — B.A. Degree
1. Complete general university requirements and B.A. degree requirements.
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 adviser) 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

Psychology

College of Human and Rural Development

Degrees: B.A., B.S.
Minimum Requirements for Degrees: B.A. — 120 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.

Faculty

Department Head and Professor: E. Clifford Brennen
Professors: Charles Geist, Richard Katz, James Orvik
Associate Professors: Richard Possenti
Assistant Professors: James Cole, William Connor, Carol Diehl, Kenneth Green, Victor Lieberman, Cathy Sink, Richard Stenard

Requirements

Psychology — B.A. or B.S. Degree
1. Complete the general university requirements and B.A. or B.S. degree requirements.
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
*Anth. 242 — Native Cultures of Alaska	3

3. Complete 21 credits from the following:**

Psy. 210 — Cross-Cultural Psychology	3
Psy. 230 — Psychology of Adjustment	3
Psy. 304 — Personality	3
Psy. 330 — Social Psychology	3
Psy. 345 — Abnormal Psychology	3
Psy. 350 — Comparative Psychology	3
Psy. 355 — Foundations of Counseling I	3
Psy. 356 — Foundations of Counseling II	3
Psy. 370 — Drugs and Drug Dependence	3
Psy. 380 — Human Behavior in the Arctic	3
Psy. 440 — Learning	3
Psy. 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	120

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

MINOR in Psychology
Complete 15 credits of psychology courses beyond Psychology 101.

Resource Economics

School of Management

Degree: M.S.
Minimum Requirements for Degree: 31 additional credits

Faculty

Department Head and Associate Professor: Otis W. Gilley
Professors: J. Patrick O'Brien, Wayne C. Thomas, Richard J. Solie (Adjunct)
Associate Professors: Yeung-nan Shieh, William Workman
Assistant Professors: Robert R. Logan, Dennis Olson, Monica Thomas, Nancy Williams

Requirements

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.
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	6
Approved by graduate committee.	
Econ. 699 — Thesis	6

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 course in financial management.
2. Complete the general university requirements and master's degree requirements.
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.

Rural Development

College of Human and 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: Richard A. Caulfield, 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.*
2. Complete the following program (integrated major/minor) 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
R.D. 475 — Senior Project	3
R.D. Elective	6
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 — Waterfowl and Wetlands Ecology and Management 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. 303 — 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. 331 — The Legal Environment of Business 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 ....6 or more

Community Research and Cultural Documentation
Designed for individuals interested in becoming involved in accessing, organizing and disseminating information at the community level, particularly through community information centers.
BA 100 — Intro. to Data Proc. & BASIC Lang. 3
ANS 120 — Cultural Differences in Institutional Settings 3
LS 201 — Information Resources & Strategies 3
JB 204 — Basic Photojournalism 3
SOC 250 — Intro. Statistics for Behavioral Sciences 3
ANS 301 — Native Cultural Heritage Documentation 3
ED 311 — Audio-Visual Methods and Materials 3
ANS 320 — Language & Culture: Application of Alaska 3
SPC 330 — Intercultural Communication 3
SPC 335 — Organizational Communication 3
ANS 351 — Practicum in Native Cultural Expression 3
JB 372 — Methods of Instructional Broadcasting 3
ANS 401 — Knowledge of Native Elders 3
ANS 421 — Analytical Techniques 3
SOC 473 — Social Science Research Methods 3
Approved Electives ....3 or More

Community Organization and Service
Designed for individuals who are interested in becoming involved with community level service organizations and programs.
ANS 120 — Cultural Differences in Institutional Settings 3
ANS 425 — Federal Indian Law and Alaska Natives 3
BA 301 — Processes of Management 3
HMSV 201 — Introduction to Human Services 3
HMSV 350 — Foundations of Counseling 3
HMSV 410 — Management of Human Services Programs 3
Psy. 101 — Introduction to Psychology 3
Psy. 210 — Cross-Cultural Psychology 3
Psy. 240 — Developmental Psychology in Cultural Perspectives 3
Soc. 101 — Introduction to Sociology 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
Soc. 405 — Social Change 3

Shd Be moved

Russian Studies

Interdisciplinary

Degree: B.A.
Minimum Requirements for Degree: 130 credits

Faculty

Coordinator and Associate Professor: Serge Lecomte

Requirements

Russian Studies — B.A. Degree
1. Complete general university requirements and B.A. degree requirements.
2. Complete the following program (major) requirements:

Core courses (21-24 credits):	*Credits*
Approved Anthropology Elective	3
Geog. 306 — Geography of the Soviet Union	3
Hist. 344 — Modern 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 1900-1945	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.

Science Management

School of Engineering

Degrees: M.S.
Minimum Requirements for Degrees: 30 credits (beyond a bachelor's degree in a scientific field)

The science management curriculum is designed for graduate 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 or in one of the more general fields of 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 science.

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.

Requirements

Science Management — M.S. Degree
1. Complete the general university requirements and master's degree requirements.
2. Complete the following degree and program (major) requirements:

a. Nine credits, including 9
1. ESM 601 — Engineers in Organizations
2. ESM 609 — Project Management
   or
   BA 643 — Marketing Management*
3. A third course chosen from
   BA 643 — Marketing Management*
   ESM 608 — Legal Principles for ESM (with new description)
   ESM 609 — Project Management
   BA 661 — Human Resource Management*

b. Six credits, chosen from 6
ESM 605 — Engineering Economy
Acct. 602 — Financial Accounting Concepts for Administrators*
BA 625 — Financial Management*
If a student has had a course in engineering economy, Acct. 602 and BA 625 may be taken; otherwise, ESM 605 and Acct. 602 are required.

c. Six credits, chosen from 6
ESM 620 — Statistics for ESM
ESM 621 — Operations Research
BA 605 — Management Information Systems*

d. ESM 684 — Project: 3 credits 3

3. Nine credits of electives in the student's technical specialty 9

TOTAL 33

*No more than twelve (12) credits may be taken in the School of Management.

In addition to completing the 33 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 33 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. (See also "Engineering Management.")

Social Work

College of Human and Rural Development

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

Graduates in social work qualify for beginning practice positions in child welfare, mental health, services to the aged, family agencies, youth programs, health services, Native corporations, and various other social agencies. Students learn to work with people on a personal level and are placed in a social agency as part of their course work during the senior year. Social work applies knowledge in the behavioral sciences to deal with the emotional and social problems of individuals, families, and communities.

The curriculum includes a liberal arts base, foundation requirements in the behavioral sciences, and sequences in social policy and services, practice methods, and field instruction. One major emphasis in the major is preparation of the student for social programs that serve rural communities.

The UAF baccalaureate social work program has attained national accreditation with the Council on Social Work Education.

Faculty

Department Head and Professor: E. Clifford Brennen
Professors: E. Clifford Brennen, M.S. Nagahbushana Rao
Associate Professors: Gerald Berman, John Booker
Assistant Professors: Margo Okazawa-Rey

Requirements

Social Work — B.A. Degree
1. Complete the general university requirements and B.A. degree requirements. (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
*Anth. 242 — Native Cultures of Alaska 3

3. Complete the following courses:
SWK 103 — Social Work: Profession and Practice 3
~~HMSV 201 — Introduction to Human Services ..... 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 120

*May be used toward general degree requirements where applicable.

Sociology

College of Human and Rural Development

Degrees: B.A., B.S.
Minimum Requirements for Degrees: B.A. — 120 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.

Faculty

Department Head and Professor: E. Clifford Brennen
Professors: E. Clifford Brennen, M.S. Nagahbushana Rao
Associate Professors: Gerald Berman, John Booker
Assistant Professors: Elmer Haymon, Valerie Montoya

Requirements

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

2. Complete the following departmental core requirements:
*Psy. 101 — Introduction to Psychology 3
Soc. 101 — Introduction to Sociology 3

*Psy. 240 — Develop. Psychology in Cross-Cult. Persp. 3
Psy./Soc. 250 — Introductory Statistics for Behav. Sc. 3
Psy./Soc. 473 — Social Science Research Methods 3
*Anth. 242 — Native Cultures of Alaska 3

3. Complete the following Sociology Core requirements:
Soc. 301 — Rural Sociology 3
Psy./Soc. 330 — Social Psychology 3
Soc. 363 — Social Stratification 3
Soc. 402 — Theories of Sociology 3

4. Complete 12 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. 335 — Sociology of Deviant Behavior 3
Soc. 405 — Social Change 3
Soc. 406 — Environmental Sociology 3
Soc. 407 — Formal Organizations 3
Soc. 408 — American Minority Groups 3
R.D. 325 — Community Org. & Devt. Strategies 3
Minimum Credits required for Degree 120

*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.

Space Physics

College of Natural Sciences

Degrees: M.S., Ph.D.
Minimum Requirements for Degrees: M.S. — 30 additional credits; Ph.D. — no fixed credits

Faculty

Department Head and Professor: Roger Sheridan
Professors: Charles S. Deehr, Robert D. Hunsucker, Kolf Jayaweera, Joseph R. Kan, Lou-Chuang Lee, Manfred H. Rees, Juan G. Roederer, Glenn E. Shaw, Gulamabas G. Sivjee, Daniel W. Swift, Gunter E. Weller, Gerd Wendler
Associate Professors: Vladimir Degen, David C. Fritts, Thomas J. Hallinan, John S. Murray, John V. Olson, Roger W. Smith, Brenton J. Watkins
Assistant Professors: Sue Ann Bowling, Neal Brown
Laboratory Instructor: John K. Petersen

Requirements

Space Physics — M.S. Degree
1. Complete the general university requirements and the master's degree requirements.
2. Complete a minimum of 30 credits of approved courses including:

	Credits
Basic courses in space physics	12
Approved physics courses (minimum)	12

Space Physics — Ph.D. Degree
1. Complete the general university requirements and Ph.D. requirements.
2. Complete the following:

	Credits
Basic courses in space physics	12
Approved physics courses (minimum)	12

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

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

(See also "Atmospheric Sciences.")

Speech Communication

College of Liberal Arts

Degree: B.A.
Minimum Requirements for Degree: 130 credits

The Department of Speech and Drama provides formal course offerings in both Speech Communication and Theatre. Coursework in Speech Communication prepares an individual to handle the challenges of communicating effectively in a rapidly changing world. The major and minor program in Speech Communication provide the student with a comprehensive background in the discipline in preparation for employment or further education. Individuals majoring in a wide variety of other disciplines will also find Speech Communication electives to be valuable additions to their programs.

Faculty

Department Head and Associate Professor: Robert B. Arundale
Professor: Walter G. Ensign, Jr., Lee H. Salisbury
Associate Professor: Jayna Orchard
Assistant Professors: John Leipzig, Johnny Murdock, Ken Risch
Instructor: Marcia Stratton

Requirements

Speech Communication — B.A. Degree
1. Complete the general university degree requirements and B.A. degree requirements, 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. 231 — Business and Professional Communication	3
Sp.C. 251 — Argumentation and Debate	3
Sp.C. 261 — Oral Interpretation	3
Sp.C. 282 — Communication Research Methods	3
300 Level*	
Sp.C. 320 — Communication and Language	3
Sp.C. 321 — Nonverbal Communication	3
Sp.C. 322 — Interpersonal Communications	3
Sp.C. 330 — Intercultural Communication	3
Sp.C. 331 — Group Communication	3
Sp.C. 335 — Organizational Communication	3
Sp.C. 342 — Advanced Public Speaking	3
400 Level*	
Sp.C. 425 — Communication Theory	3
Sp.C. 441 — Persuasion	3
Sp.C. 443 — Rhetorical Theory	3
Sp.C. 475 — Speech Communication in Education and Training	3
Sp.C. 482 — Seminar in Speech Communication	3

3. Minimum credits required 130

*With approval of advisor, an appropriate level Speech Communication course (3 credits) may be used to meet this requirement.

MINOR in Speech Communication:
A minor in Speech Communication requires the completion of 15 credits in Speech Communication courses beyond the courses taken to satisfy the university oral communication requirement. At least 6 of the credits must be at the 300 level or higher. 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

College of Liberal Arts

Degree: B.A.
Minimum Requirements for Degree: 130 credits

The Department of Speech and Drama provides formal course offerings in both Speech Communication and Theater. The program in Theater is structured to familiarize students with the theory and practice applicable to all aspects of theatrical production. With a variety of career options open to theater majors, the program's coupling of classroom study with a substantial schedule of productions is designed to prepare the student pursuing the major or minor for employment or further education. In addition, theater classes and productions are open to the participation of all students and provide unique opportunities for creative expression and development when coupled with other programs.

Students pursuing a major or minor in theater are encouraged to work closely with a theater faculty member in arranging their individual program of study, including appropriate courses in related disciplines.

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.
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	
***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 316 — Television Production	
E.S. 101 — Graphics (2 cr.)	
P.E. 100 — Modern Dance, Fencing, Gymnastics (1 cr. each)	
Sp.C. 261 — 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.

Wildlife Management

College of Natural Sciences

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: Robert B. Weeden
Professors: Frederick C. Dean, Robert A. Dieterich, David R. Klein, Robert G. White
Assistant Professors: R. Terry Bowyer, James S. Sedinger

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.
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
*Bot. 239 — Plant Form and Function	4
Biol. 271 — Principles of Ecology	4
Bot. 331 — Systematic Botany	4
Select 2 of the following:	
Biol. 423 — Ichthyology (4)	
Biol. 425 — Mammalogy (3)	
Biol. 426 — Ornithology (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
Speech Communication 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.
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
*Bot. 239 — Plant Form and Function	4
Biol. 271 — Principles of Ecology	4
Bot. 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
Speech Communication 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. 322 — Ethics	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 — Waterfowl and Wetlands Ecology and Management	3
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.
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 Ph.D. general degree requirements.

Yupik Eskimo

College of Liberal Arts

Degree: B.A.
Minimum Requirements for Degree: 130 credits

Faculty

Chairman and Professor: Michael E. Krauss
Associate Professor: Steven Jacobson
Assistant Professors: Edna Maclean
Instructor: Eliza Jones

Requirements

Yupik Eskimo — B.A. Degree
1. Complete general university requirements and B.A. degree requirements.
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 ANS. 320 — Language and Culture	3
Complete two of the following:	
ANL 387 — Bilingual Methods and Materials	3
Anth. 242 — Native Cultures of Alaska	3
Hist. 110 — History of Alaska Natives	3
P.S. 263 — Alaska Native Politics	3
Engl. 349 — Narrative Art of Alaska Native Peoples (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
3. Minimum Credits Required	130

Zoology

College of Natural Sciences

Degrees: M.S., Ph.D. (Interdisciplinary)
Minimum Requirements for Degrees: M.S. — 30 additional credits

Faculty

Head, Department of Biology, Fisheries and Wildlife and Professor: Robert B. Weeden
Professors: F. Stuart Chapin, Howard Feder, Dale D. Feist, R. Dale Guthrie, Stephen F. MacLean, Jr., David F. Murray, Gerald F. Shields, Ronald L. Smith, L. Gerard Swartz, Robert G. White
Associate Professors: Carol F. Feist, L. Keith Miller, Mark W. Oswood
Assistant Professors: W. Scott Armbruster, Brian M. Barnes, R. Terry Bowyer, John P. Bryant, John F. Fox, Edward C. Murphy, Kent E. Schwaegerle, James S. Sedinger
Instructor: Douglas L. Schamel

Requirements

Zoology — M.S. Degree
1. Complete the general university requirements and master's degree requirements.
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.

Zoology — Ph.D. Degree
See Ph.D. general degree requirements. Additional requirements will be determined in consultation with graduate advisory committee.

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 Vice Chancellor for Academic Affairs (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 Identification

Courses that may be used in satisfying general degree requirements (e.g., Social Science Elective, Written Communication, etc.) are identified in the course description section of this catalog by the following designators:

h — Humanities	o — Oral Communication
m — Mathematics	s — Social Science
n — Natural Science	w — Written Communication

For example, Hist. 341, History of Alaska (3+0)s may be utilized to satisfy the "social science elective" requirement. Engl. 111, Methods of Written Communication (3+0)w may be used to meet the written communication general degree requirement.

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.

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. 303 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. Materials fee: $20.00. (Prerequisite: Acct. 102.)

Acct. 323 3 Credits **As Demand Warrants**
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.)

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 and Spring**
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 As Demand Warrants
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.)

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 As Demand Warrants
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 As Demand Warrants
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 As Demand Warrants
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. 602 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. 623 3 Credits As Demand Warrants
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.)

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.)

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 natural resources management institutions and processes. Emphasizes public lands and resources, but considers private firms and native regional corporations as well. (Prerequisites: A.L.R. 101 and at least sophomore standing.)

A.L.R. 211 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 botany course or permission of instructor. Next offered: 1987-88.)

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. 312 3 Credits Alternate Fall
Introduction to Range Management (3+0)
Applied ecological treatment of soil, plant and grazing animal relationships on uncultivated lands, including discussions on the origin of the discipline, management practices, important rangelands of North America, with emphasis on Alaska's rangelands and grazers. (Prerequisites: Biol. 105, 106, Bot. 239 or permission of instructor; A.L.R. 320, 321 recommended. Next offered: 1988-89.)

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; Bot. 239 recommended. Next offered: 1988-89.)

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: 1988-89.)

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: 1987-88.)

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: 1987-88.)

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: Bot. 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 and significance of public policies in land, water, forest, wildlife, mineral, petroleum, agricultural and aesthetic resources. Focuses on Alaskan and relevant national issues. (Prerequisites: Upper division or graduate standing. Next offered: 1987-88.)

A.L.R. 401 3 Credits Alternate Spring
Natural Resources Legislation (3+0)
The background and importance of selected federal and Alaskan legislation in land management, resource conservation and environmental arenas. (Prerequisite: Upper division or graduate standing in agriculture, wildlife, fisheries, natural resources management, or related fields, or permission of instructor. Next offered: 1988-89.)

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: 1987-88.)

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: 1988-89.)

A.L.R. 412 3 Credits Alternate Fall
Field Crop Production (3+0)
Agronomic principles and practices involved in the production, storage, marketing, and utilization of field crops. (Prerequisites: A.L.R. 311. Next offered: 1988-89.)

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: 1987-88.)

A.L.R. 425 2 Credits Spring
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, at least junior standing or permission of instructor.)

A.L.R. 430 3 Credits Spring
Land-Use Planning (3+0)
History, legal framework, principles, processes, and practices of land use planning. Important Alaskan issues and problems are emphasized. (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: 1988-89.)

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: 1988-89.)

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, Bot. 239; A.L.R. 350 or instructor's permission. Next offered: 1987-88.)

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: 1988-89.)

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: at least 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: 1988-89.)

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: at least junior standing or permission of instructor.)

A.L.R. 480 3 Credits Alternate Fall
Soil Management (2+0)
Managing soil to maintain or increase crop productivity while minimizing soil losses from wind and water erosion. (Prerequisites: A.L.R. 380. Next offered: 1987-88).

A.L.R. 630 3 Credits Fall
Planning Theory (3+0)
Detailed analysis of principles and processes of solving complex group problems; focused on land planning in Alaska. (Prerequisite: Graduate standing or permission of instructor.)

A.L.R. 631 3 Credits Spring
Planning Practicum (3+0)
Application of principles and processes through group projects focused on Alaska land or resource problems. (Prerequisite: A.L.R. 630 or permission of instructor.)

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: 1987-88.)

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: 1988-89.)

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: 1987-88.)

A.L.R. 672 2 Credits Alternate Fall
Dynamics of Nitrogen in Forest Ecosystems (2+0)
Consideration of the state and dynamics of nitrogen in the complete forest ecosystem, including its basic chemistry, measurement techniques, functions, component partition, and changes in these features with forest disturbances. (Prerequisites: Graduate status in natural resources management, wildlife-fisheries, biological sciences, or permission of the instructor. Next offered: 1988-89.)

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: 1988-89.)

A.L.R. 680 3 Credits Alternate Fall
Environmental Decision-Making (3+0)
The potential and actual role of science in natural resources and environmental decision-making. Explores the roles of values and analysis, and of techniques such as modeling, forecasting and technology assessment in political decisions. (Prerequisites: Graduate standing or permission of instructor. Next offered: 1988-89.)

Alaska Native Languages

ANL 141 3 Credits Fall
ANL 142 3 Credits Spring
Beginning Athabaskan — Koyukon (3+0) h
Introduction to Koyukon, the Athabaskan language of the Koyukuk and Central Yukon rivers. Open to speakers and non-speakers. Literacy and grammatical analysis for speakers. For others, a framework for learning to speak, read, and write the language. (Prerequisite: ANL 141 for ANL 142)

ANL 215 3 Credits Fall
ANL 216 3 Credits Spring
Alaska Native Languages (3+0) h
A survey of all Native languages of Alaska; history, present, and future, with examples of Indian and Eskimo language structures, present situation and prospects as a cultural force. Fall: Eskimo-Aleut, with general overview. Spring: Indian languages, with overview. Semesters may be taken independently. Open to all students.

ANL 241 3 Credits Fall
ANL 242 3 Credits 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.)

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 110 1 Credit Fall and Spring
Parliamentary Procedures (1+0)
(Same as P.S. 110)
Introduction to the rules and principles of parliamentary procedure and their application to group decision-making processes.

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 Fall
Alaska Native Dance (2+0) h
Traditional Native Alaskan dancing, singing, and drumming of songs from Alaska's major indigenous groups will be taught by guest Native elders and dancers. If sufficient interest, a dance group will be assembled using class members for spring presentation primarily in the Fairbanks area, including the Festival of Native Arts.

ANS 161 3 Credits Fall
Introduction to Tuma Theatre (3+0) h
(Same as THR 161)
Introduction to playwriting and acting within an Alaskan Native cultural context. Original theatrical works based on traditional themes and contemporary issues will be developed and rehearsed. Tuma Theatre will tour its annual production each spring, its membership to be selected from the class. (Prerequisite for ANS/THR 361, Advanced Tuma Theatre.)

ANS 250 3 Credits Fall and Spring
Current Alaska Native Leadership Perspectives (3+0) s
Prominent leaders in the Native community are brought into direct classroom contact with students to discuss important issues in rural Alaska and the larger Native community.

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 Department Head.)

ANS 301 3 Credits Alternate Fall
Native Cultural Heritage Documentation (3+0) h
A study of the methods by which significant aspects of Native life may be documented for research purposes and/or community interests. This course is particularly suitable for students interested in Native cultural heritage expression through the arts, literature, language and historical research. (Prerequisites: Hist. 100 and Anth. 242 or permission of instructor. Next offered: 1988-89.)

ANS 310 3 Credits Fall
Alaska Native Corporations (3+0) s
An examination of Native corporation goals and methods as they implement the Alaska Native Claims Settlement Act and 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 Culture: Applications of Alaska (3+0) s
(Same as Anth. 320)
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. 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 Alternate Spring
Native Self Government (3+0) s
(Same as P.S. 325)
Comparative study of indigenous political systems, customary law and justice in Alaska emphasizing the organization of Native governance under federal Indian Law and Alaska state chartered local government with comparisons between Alaska Native political development and those of tribes in the contiguous 48 states and northern hemisphere tribal people. (Prerequisites: Hist. 100, P.S. 263. Next offered: 1987-88.)

Contemporary Native
7 ANS 340 American Lit (H)

ANS 351 1-3 Credits — Fall and Spring
Practicum in Native Cultural Expression (0 + variable)
Continuation of ANS 251, for students actively involved in advanced organization, promotion, and expression of Alaskan Native cultural heritage projects (Festival of Native Arts leadership, Tuma Theatre, Theata magazine, etc.) A maximum of 3 practicum credits can be applied toward a Native studies major or minor. (Prerequisite: Permission of instructor.)

ANS 361 3 Credits — Fall
Advanced Tuma Theatre (3 + 0) h
(Same as THR. 361)
Continuation of ANS/THR 161 with more advanced involvement in writing (or other production oriented creative activity), research and development of original theatrical works to be performed by the Tuma Theatre touring group. (Prerequisites: ANS/THR 161 and either THR 221, THR 241, THR 343, THR 347 or permission of instructor.)

ANS 375 3 Credits — Alternate Spring
Native American Religion and Philosophy (3 + 0) h
Philosophical aspects of Native American world views, emphasizing 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. Next offered: 1987-88.)

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. Students elicit 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 — As Demand Warrants
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
A "special relationship" developed between the federal government and Native Americans based on land transactions and recognition of tribal sovereignty. This course examines federal Indian law and policy which evolved from this relationship with special attention 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 different school systems historically serving Native people, current efforts toward local control, and the cross cultural nature of this education.
(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 study of human societies and cultures based on the findings of the four subfields of the discipline: archaeological, biological, cultural and linguistic. Materials fee: $10.00.

Anth. 102 3 Credits — Fall and Spring
Faces of Culture (3 + 0)
Television enhanced instruction in cultural anthropology including an introduction to methods, theories, fundamental concepts and foundations for understanding differences in cultures; provides background for more specialized courses in cultural anthropology. Telecourse fee: $20.00.

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: 1988-89.)

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: 1987-88.)

Anth. 123 3 Credits — Alternate Fall
Origins of Alaska's Native Peoples (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: 1987-88.)

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: 1988-89.)

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: 1989-90.)

Anth. 210 3 Credits — Every Third Spring
New World Prehistory (3 + 0) s
The culture history of native Americans from earliest times excluding Alaska and Canada, including those in Mexican and Peruvian states. (Prerequisites: Anth. 101 or 211 or permission of instructor. Next offered: 1987-88.)

Anth. 211 3 Credits — Alternate Fall
Fundamentals of Archaeology (2 + 3) s
The history of archaeology and its current methods and major areas of inquiry. Materials fee: $10.00. (Next offered: 1987-88.)

Anth. 212 3 Credits — Alternate Fall
Old World Prehistory (3 + 0) s chg desc.
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 premission of instructor. Next offered: 1988-89.)

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: 1988-89.)

> Anth 230 - Oral Tradition (H)

Anth. 240 3 Credits — Alternate Fall
Native Peoples of North America (3 + 0)
A survey course of the cultures of the native peoples of continental United States and Canada, excluding Alaska. (Next offered: 1987-88.)

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. Materials fee: $20.00

> and 245 - Circumpolar Cultural Traditions (S)

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 Spring
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: 1987-88.)

Anth. 309 3 Credits Alternate Springs
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. Materials fee: $25.00. (Prerequisites: Anth. 101 or 211, or permission of instructor. Next offered: 1989-90.)

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. Materials fee: $10.00. (Prerequisite: Anth. 222 or Biol. 105-106. Next offered: 1987-88.)

Anth. 320 3 Credits Spring
Language and Culture: Applications of Alaska (3+0) s
(Same as ANS 320)
Examination of aspects of language, ethnicity, and their interrelationships. Emphasis is placed on the system language uses to communicate ethnic identity and how communication between ethnic groups is affected by patterns of language use. 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.)

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. 323 3 Credits Alternate Fall
Archaeology of China from Earliest Times to 771 B.C. (3+0) s
A detailed survey of eary human developments, the rise of agricultural communities, and the Golden Age states (Xia, Shang, Zhou). (Prerequisites: Any archaeology course or Asian history course or permission of instructor. Next offered: 1987-88.)

Anth. 329 3 Credits Alternate Fall
Peoples of the Russian North (3+0) s
A study of the native peoples and cultures of the northern region of the Russian Federation (R.S.F.S.R.) stressing the ethnography of the precontact societies, the historical interaction of Russian culture including the Soviet state. (Prerequisites: Anth. 101 or 200 or permission of instructor. Next offered: 1988-89.)

Anth. 350 3 Credits Every Third Fall
Russian Period in Alaska: 1741-1867 (3+0)
A survey of the Russian period in Alaskan history, with emphasis on the social and cultural impacts on native Alaskans. (Prerequisites: Jr. standing or permission of instructor. Next offered: 1988-89.)

Anth. 380 3 Credits Alternate Fall
The People of Alaskan Southwest: Aleuts Kodiak Islanders and the Chugach (3+0)
Cultural heritage and present conditions of the Aleuts, including people of the Aleutian archapelago, Kodiak Islanders, people of the Alaska Peninsula and the Chugach of Prince William Sound. Materials fee: $25.00. (Prerequisites: Anth. 242 or permission of instructor. Next offered: 1987-88.)

Anth. 381 3 Credits Alternate Spring
The Inupiaq and Yup'ik Peoples (3+0)
Study of the contemporary conditions and traditional heritage of the Inupiaq and Yup'ik peoples including the impact of Euroamericans on these populations and cultures. Materials fee: $20.00. (Prerequisites: Anth. 242 or permission of instructor. Next offered: 1987-88.)

Anth. 382 3 Credits Alternate Spring
The People of Alaskan SE (3+0)
The Tlingit, Haida and Tsimshian societies are discussed in the framework of Northwest Coast culture-area, including impact of Russian penetration and of the recent historical factors. Materials fee: $15.00. (Prerequisites: Anth. 242 or permission of instructor. Next offered: 1987-88.)

Anth. 383 3 Credits Alternate Fall
Athabaskan Peoples of Alaska and Adjacent Canada (3+0)
Study of the contemporary conditions and traditional heritage of the Athabaskan populations of Alaska and Canada, including the impact of Euroamericans on these populations and cultures. Materials fee: $20.00. (Prerequisites: Anth. 242 or permission of instructor. Next offered: 1988-89.)

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: 1988-89.)

Anth. 412 3 Credits As Demand Warrants
Anthropology of Art (3+0)
Anthropological study of art in cross-cultural perspective. Primary focus is on social context of art production and use, and on cross-cultural variations in definition of an artist's role. (Prerequisites: Senior standing or permission of instructor.)

Anth. 413 3 Credits Alternate 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. Materials fee: $10.00. (Prerequisite: A course in archeology or permission of the instructor. Next offered: 1988-89.)

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 archeology 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.)

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. Materials fee: $10.00. (Prerequisite: Anth. 315 or permission of instructor).

Anth. 428 3 Credits Every Third Fall
Ecological Anthropology (3+0) n
The investigation of the biological, environmental and cultural factors and their interplay in defining the human condition, with examples from Arctic and other populations. (Prerequisites: Junior standing or permission of instructor. Next offered: 1989-90.)

Anth. 461 3 Credits Alternate Fall
Stratigraphy (2+3)
Sedimentation and stratification as site formational and deformational processes and documentation of sites. (Prerequisites: Geos. 101, Anth. 211. Next offered: 1987-88.)

Anth. 465 3 Credits Alternate Spring
Geoarcheology (3+0)
(Same as Geos. 465)
The geological context of archeological sites and the geologic factors that affect their preservation, with emphasis on Alaska. Includes a one or two-day field trip planned for a weekend in late April or early May. (Prerequisites: Geos. 101, an introductory course in archeology, or permission of instructor. Next offered: 1987-88.)

Anth. 600 0-1 Credits Fall and Spring
Anthropology Colloquium (1+0)
An interdisciplinary colloquium focusing on topics related to the north with emphasis on anthropology and related disciplines. May be repeated. (Prerequisite: Graduate standing or permission of department head.)

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: 1987-88.)

Anth. 604 3 Credits As Demand Warrants
Seminar: Language and Culture (3+0) s
Participants in the seminar will examine in-depth the interrelation between language and culture in the context of theories of human communication, semiotics, and maintenance of cultural boundaries. In particular, the influence of the Sapir/Whorf hypothesis in anthropological thinking today and the field of ethnoscience will be examined, as well as language change in contact situations, with emphasis on emergence of pidgins and creole languages and effects of the introduction of writing. (Prerequisites: Graduate standing: previous credit in anthropological or descriptive linguistics or permission of instructor.)

Anth. 608 3 Credits Every Third Spring
Classics in Athropology (3+0)
Landmark contributions to anthropological literature, ethnographies and theoretical works, will be discussed. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1989-90.)

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. Materials fee: $25.00. (Prerequisites: Graduate standing or permission of instructor. Next offered: 1987-88.)

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. 613 3 Credits As Demand Warrants
Seminar: Problems in Arctic Archeology (3+0)
A seminar which focuses in depth upon topics of current interest in North American Arctic archeology including Beringian prehistory, Interior archeology, coastal archeology, past arctic adaptations, etc. (Prerequisites: Graduate standing or permission of instructor.)

Anth. 614 3 Credits Alternate Spring
Archeology of Siberia (3+0)
A thorough survey of the Paleolithic, Mesolithic, Neolithic, Bronze and Iron ages of Siberia through an examination on key archeological sites. Data from archeology, ethnology, linguistics and paleoanthropology will be applied to ancient population changes and the ethnogeneses of Siberian peoples. (Prerequisites: Graduate standing or permission of instructor. Next offered: 1987-88.)

Anth. 615 3 Credits As Demand Warrants
Seminar: Archeological Method and Theory (3+0)
This course provides training and experience in analyzing archeological data sets and writing site reports. It will introduce current methodological and theoretical issues in archeology, and guide the student through the development of a research design. (Prerequisites: Graduate standing.)

Anth. 616 3 Credits Alternate Spring
Classics in Archaeology (3+0)
Archaeological monographs, books, and articles which have influenced the direction of the discipline; alternately general classics and arctic-region classics. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1988-89.)

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: 1987-88.)

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: 1988-89.)

Anth. 637 3 Credits As Demand Warrants
Methods in Ethnohistorical Research (3+0)
In the seminar, students of anthropology are introduced to the methods of historical research, particularly the critical evaluation of written documents, problems of archaic language and paleography, and methods for assessing art and folkloristic tradition as sources of history. Oral history and the data of language and archeology are considered. (Prerequisites: Graduate standing in anthropology or permission of instructor.)

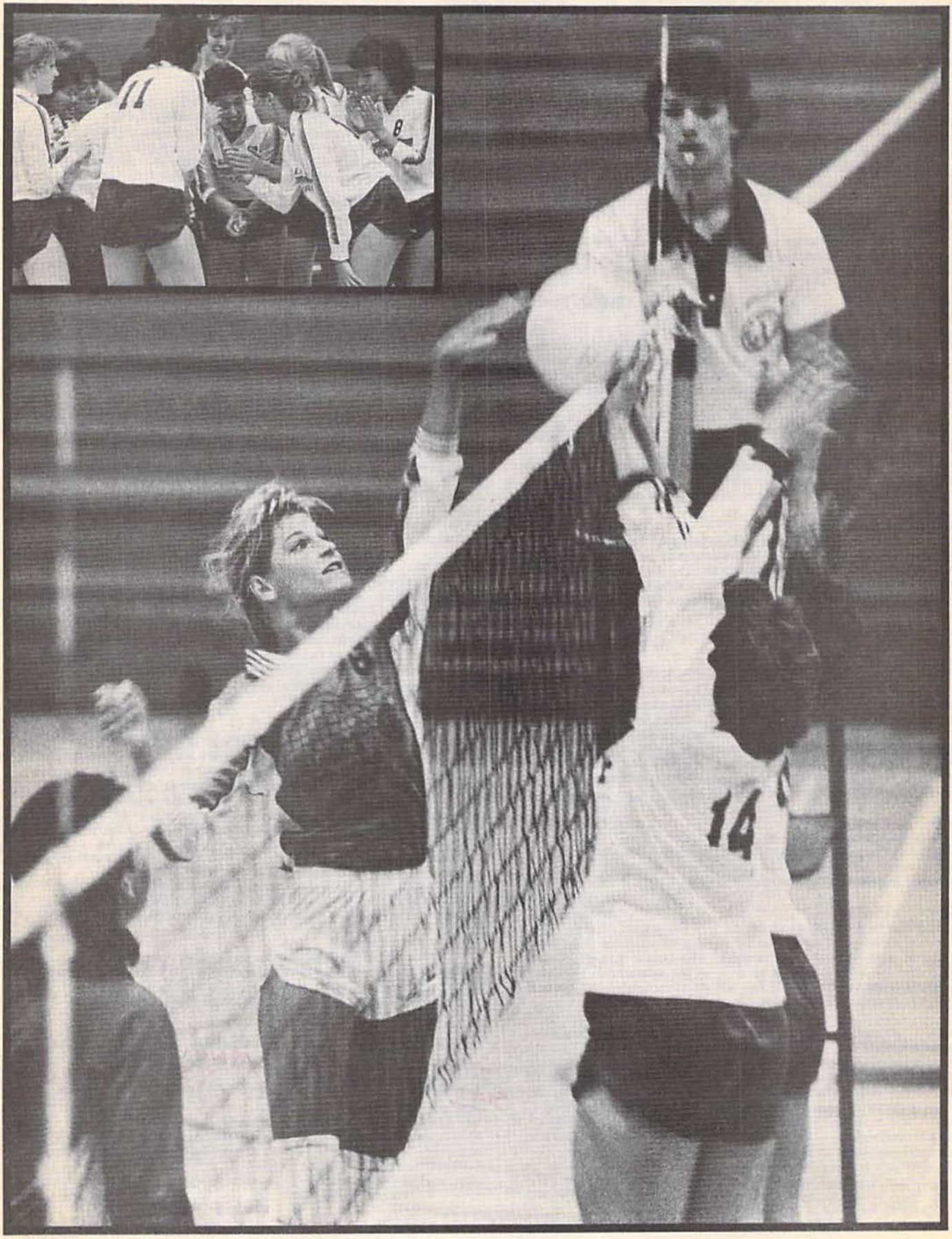
Anth. 640 3 Credits As Demand Warrants
Problems in Anthropology (3+0)
Examination and criticism of exemplary landmarks in the anthropological literature. The course will be devoted to a subdiscipline during each offering. (Prerequisites: Graduate standing or permission of instructor.)

Anth. 650 3 Credits Every Third Spring
Anthropological Perspectives on Russian America (3+0)
An in-depth study of Russian penetration in North America, Russian institutions, and Russian impacts on the Aleut, Tlingit and Yup'ik. (Prerequisite: Graduate standing or permission of the instructor. Next offered: 1987-88.)

Applied Statistics

A.S. 301 3 Credits Fall and Spring
Elementary Probability and Statistics (3+0)
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)

Competition ... *and working together*



for the same goals

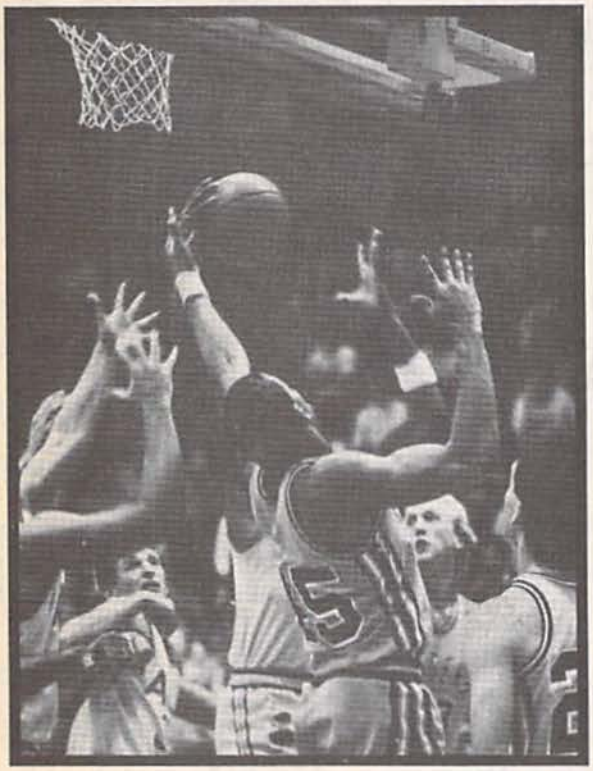
(Facing Page, Top Left Corner)
The Lady Nanook volleyball team meets for a pep talk during a match with the Slippery Rock Rockets of Pennsylvania.

(Facing Page)
Anita Krejci (left) taps the ball to the Slippery Rock team. Krejci, from Fairbanks, is a senior business major.

(Top Left)
Lots of hands go up for the ball as the Nanook men's basketball team battles the Puget Sound Loggers.

(Top Right)
It's always exciting when the Lady Nanook basketball team plays intrastate rival University of Alaska-Anchorage Seawolves.

(Bottom)
UAF goalie Mike Carr makes a save during the Homecoming weekend games with North Dakota State University.



A.S. 351 2 Credits Spring
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. (Prerequisite: AS 301.)

A.S. 400 3 Credits Fall
Statistics (3+0)
A calculus-based course emphasizing applications. Topics include: probability, point and interval estimation including maximum likelihood, one and two sample hypothesis tests including likelihood ratio rests, simple linear regression, and one-way analysis of variance. A student may not use A.S. 301 and A.S. 400 to meet the requirement of a year's sequence course in statistics. (Prerequisites: Math 200, 272, or 162.)

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 and Spring
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: 1988-89.)

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: 1987-88.)

A.S. 602 3 Credits As Demand Warrants
Experimental Design (3+0)
Constructing and analyzing designs for experimental investigations; completely randomized, randomized block and Latin-square designs, split-plot design, incomplete block design, confounded factorial designs, lattic and cubic lattic designs, treatment of missing data, comparison of designs. (Prerequisites: A.S. 401 or consent of instructor.)

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: 1987-88.)

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. 606 — 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 pictorial form; principles of composition, organization, and structure.

Art 162 3 Credits Fall, Spring
Color and Design (1+4) h
Fundamentals of color principles and interactions. Emphasis on two dimensions. Materials fee: $25.00.

Art 163 3 Credits Fall, Spring
Three-Dimensional Design (1+4) h
Fundamental concepts in organization of 3-dimensional forms. Introduction to various materials and construction techniques. Materials fee: $25.00

Art 201 3 Credits Fall, Spring
Beginning Ceramics (1+4) h
An introduction to ceramics. Foundation experiences with clays, glazes, plaster, enamels, glass, kiln stacking and firing. Materials fee: $35.00. (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: $25.00. (Prerequisite: Art 105.)

Art 207 3 Credits Fall, Spring
Beginning Printmaking (1+4) h
Introduction to the concepts and techniques of printmaking. Subject areas taken from: relief, intaglio, serigraphy, lithography. 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: $35.00. (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 basic sculpture techniques and principles. Materials fee: $35.00. (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
Basic materials and techniques in either medium. Introduction to pictorial principles and organization of paintings. (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: 1987-88.)

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 beginning ceramics with a major emphasis on glaze calculations, and advanced plaster techniques. Materials fee: $35.00. (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: $25.00. (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 on refinement of technique and color 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: $35.00. (Prerequisites: Art 209 or permission of instructor.)

Art 311 3 Credits Fall, Spring
Intermediate Sculpture (1+4) h
Exploration in materials and concepts of sculpture. Emphasis on personal creativity and skill development. Materials fee: $35.00. (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 painting media. Emphasis on pictorial and conceptual problems. (Prerequisite: Art 213.)

Art 324 3 Credits Fall, Spring
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: 1988-89.)

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: 1987-88.)

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: 1988-89.)

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. (Prerequisites: Advanced standing or permission of instructor.)

Art 371 3 Credits Fall
Introduction to Computer Art (1+4)
An introduction to digital editing with an overview of the field of computer art. (Prerequisites: Introductory computer course, one from Art 105, 161, 162, or 163.)

Art 401 3 Credits Fall, Spring
Advanced Ceramics (1+4) h
Advanced ceramic work with an emphasis on individual projects, plus a class project on architectural mural(s). May be repeated for credit with permission of instructor. Materials fee: $35.00. (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. May be repeated for credit. 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: $35.00. (Prerequisites: Art 309 or permission of instructor.)

Art 411 3 Credits Fall, Spring
Advanced Sculpture (1+4) h
Advanced investigation into the principles, practices and concepts of, sculpture. May be repeated for credit. Materials fee: $35.00. (Prerequisites: Art 311 or permission of instructor.)

Art 413 3 Credits Fall, Spring
Advanced Painting (1+4) h
Individual experimentation and technical/conceptual development in painting. Can be repeated for credits with permission of instructor. (Prerequisite: Art 313.)

Art 417 3 Credits Every Third Fall
Lithography (1+4) h
An exploration of stone and metal plate lithography. Materials fee: $25.00. (Prerequisite: Art 105, 207, or permission of instructor. Next offered: Fall 1989.)

Art 419 3 Credits Fall, Spring
Life Drawing (1+4) h
Drawing from life, the study of artistic anatomy. Materials fee: $30.00. (Prerequisite: Art 305 or permission of instructor.)

Art 427 3 Credits Every Third Spring
Relief (1+4) h
Woodcut and monotype with emphasis on color. Materials fee: $25.00. (Prerequisites: Art 105, 207, and 213, or permission of instructor. Next offered: 1989-90.)

Art 437 3 Credits Every Third Fall
Intaglio (1+4) h
Intaglio printmaking with emphasis on experimentation and color photo intaglio printing. Materials fee: $25.00. (Prerequisites: Art 105, 162, 207, or permission of the instructor. Next offered: 1987-88.)

Art 441 3 Credits Every Third Spring
Lost Wax Casting (1+4) h
The design and execution of jewelry and other small metal objects by lost wax casting. Materials fee: $35.00. (Prerequisite: Art 409 or permission of the instructor. Next offered: 1988-89.)

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: $35.00. (Prerequisite: Art 409 or permission of instructor. Next offered: 1989-90.)

Art 443 3 Credits Every Third Spring
Holloware (1+4) h
A study of the design and construction of holloware by raising, sinking, and fabrication. Materials fee: $35.00. (Prerequisite: Art 409 or permission of instructor. Next offered: 1987-88.)

Art 447 3 Credits Every Third Spring
Silkscreen (1+4) h
Silkscreen printing with photo process. Materials fee: $25.00. (Prerequisites: Art 105, 162, 207, or permission of the instructor. Next offered: 1987-88.)

Art 450 3 Credits Every Third Fall
Raku Pottery (1+4) h
A one semester experience in Raku pottery including kiln building for raku bodies, glazes and decorations. Materials fee: $35.00. (Prerequisite: Art 201 or permission of instructor. Next offered: 1988-89.)

Art 451 3 Credits Every Third Spring
Earthenware (1+4) h
A one semester experience in earthenware pottery including appropriate bodies, glazes, decorations and firing techniques. Materials fee: $35.00. (Prerequisite: Art 201 or permission of instructor. Next offered: 1988-89.)

Art 452 3 Credits Every Third Fall
Porcelain (1+4) h
A one semester experience in porcelain including appropriate bodies, glazes, decorations and firing techniques. Materials fee: $35.00. (Prerequisite: Art 201 or permission of instructor. Next offered: 1989-90.)

Art 453 3 Credits Every Third Spring
Kiln Design and Construction (1+4) h
A one semester experience in kiln design and construction including building a full sized kiln. Materials fee: $35.00. (Prerequisite: Art 201 or permission of instructor. Next offered: 1989-90.)

Art 454 3 Credits Every Third Fall
Vapor Glazing (1+4) h
A one semester experience in "salt glazing" (i.e. vapor glazing) including clay, glazes, decorative techniques and kilns. Materials fee: $35.00. (Prerequisites: Art 201 and permission of instructor. Next offered: 1987-88.)

Art 455 3 Credits Spring
Studio Glass (1+4) h
Studio participation in cold glass and limited hot glass techniques. Materials fee: $35.00. (Prerequisites: Advanced standing or permission of instructor.)

Art 471 3 Credits Spring
Computer Art (1+4)
Production and reproduction techniques for digital painting, images manipulation and typography. (Prerequisites: Art 371; or CS 201 or equivalent, Art 105 and one of Art 161, 162 or 163.)

Art 499 1-3 Credits Fall/Spring
Thesis Project
Directed work toward individual exhibition, completed outside regularly scheduled classes. Required for B.F.A. candidates. (Prerequisites: Senior standing.)

Biology

Biol. 103 4 Credits Spring
Biology and Man (3+3) n
Introduction to the fundamental principles of biology; emphasis on their application to man in the modern world. Course is designed for non-science majors. Includes lectures, laboratory demonstrations, 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: $10.00.

Biol. 104 3 Credits Fall and Spring
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
Principles of biology for the science major. First semester: cell structure, metabolism, genetics and evolution. Second semester: plant and animal structure and function, ecology. Biol. 105 is required for Biol. 106. Laboratory fee: $10.00. (Prerequisite: high school chemistry recommended.)

Biol. 111 4 Credits Fall
Biol. 112 4 Credits Spring
Human Anatomy and Physiology I and II (3+3) n
Integrated view of human structure and function for students in nursing, therapy, physical education, and art. Biol. 111 will cover cells, tissues and organs, skeletal and muscle systems, the nervous system, and integument. Biol. 112 examines circulatory, 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 majors in biological sciences. Laboratory fee: $10.00.

Biol. 205 3 Credits Alternate Spring
Vertebrate Anatomy (1+6) n
Anatomy of bony fishes, birds, and mammals. Laboratory dissections emphasized. Laboratory fee: $10.00. (Prerequisites: Biol. 105-106. Next offered: 1987-88.)

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: $10.00. (Prerequisites: Biol. 105-106; Chem. 103 and 104 or 105 may be taken concurrently.)

Biol. 222 4 Credits Fall
Biology of the Vertebrates (3+3) n
An introduction to the fishes, amphibians, reptiles, birds, and mammals emphasizing systematics, evolution, structure, and function. Laboratory fee: $10.00. (Prerequisites: Biol. 105-106.)

Biol. 240 4 Credits Fall
Beginnings in Microbiology (3+3)
Basic and applied microbiology for students who are not majoring in biology but wish to learn about the role that microorganisms play in human health and life.

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
Classification, structure, function, evolution, and life histories of invertebrate animals. Laboratory fee: $10.00. (Prerequisites: Biol. 105-106, 210, and 271.)

Biol. 307 3 Credits Fall
Parasitology (2+3) n
Structure, function, life history, and ecology of animal parasites. Laboratory fee: $10.00. (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, 362, 271, or permission of the instructor.)

Biol. 317 5 Credits Alternate Spring
Comparative Anatomy of Vertebrates (2+9) n
Anatomy, phylogeny, and evolution of the vertebrates. Laboratory fee: $10.00. (Prerequisites: Biol. 105-106. Next offered: 1988-89.)

Biol. 328 3 Credits Spring
Biology of Marine Organisms (3+0) n
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. 342 4 Credits Spring
Microbiology (3+3) n
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: $10.00. (Prerequisites: Biol. 105-106.)

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: $10.00. (Prerequisites: A year each of college chemistry and biology. Next offered: 1988-89.)

Biol. 362 4 Credits Fall
Principles of Genetics (3+3) n
Principles of inheritance; physico-chemical properties of genetic systems. Laboratory fee: $10.00. (Prerequisites: Biol. 105-106.)

Biol. 406 4 Credits Spring
Entomology (3+3) n
Biology of insects and related arthropods, with emphasis on anatomy, physiology, behavior, ecology, and evolution. Laboratories emphasize identification. Laboratory fee: $10.00. (Prerequisites: Biol. 105-106 and 271)

Biol 407 (WF424)

Biol. 414 4 Credits Alternate Fall
Comparative Physiology (3+3) n
Functional variations and relationships among animals; respiration, cardiovascular systems, metabolism, temperature regulation, osmoregulation, excretion, nerve and muscle function. Laboratory fee: $10.00. (Prerequisites: Biol. 271, Chem. 106; Chem. 321 and Biol. 361. Next offered 1987-88.)

Biol. 418 4 Credits Alternate Fall
Developmental Biology (3+3) n
Structural and biochemical aspects of development of multicellular organisms. Laboratory stresses study of vertebrate embryos. Laboratory fee: $10.00. (Prerequisites: Biol. 105-106, 210 or permission of instructor. Next offered: 1987-88.)

Biol. 423 4 Credits Fall
Ichthyology (3+3) n
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: $10.00. (Prerequisites: Biol. 222, and either Biol. 205, or 317; or permission of the instructor.)

Biol. 425 3 Credits Fall
Mammalogy (2+3) n
Variety of mammals, their behavior, life histories, identification, phylogeny and systematics, morphology, distribution, and zoogeography. Laboratory fee: $10.00. (Prerequisites: Biol. 222, and either Biol. 205, or 317; or permission of instructor.)

Biol. 426 3 Credits Spring
Ornithology (2+3) n
The evolution, anatomy, physiology, distribution, migration, breeding biology of birds and their classification and identification. Laboratory fee: $10.00. (Prerequisites: Biol. 222, and either 205 or 317, or permission of instructor. Concurrent enrollment in Biol. 479 is recommended.)

Biol. 441 3 Credits 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: $10.00. (Prerequisites: Biol. 210 and 271; or permission of instructor; Recommended: Biol. 308.)

Biol. 442 5 Credits Alternate Fall
Bacteriology and Immunology (3+6) n
Morphology, physiology and systematics of bacteria. Introduction to microbial pathogenesis and concepts of immunology. Laboratory fee: $10.00. (Prerequisites: Biol. 342, Chem. 321 or permission of instructor. Next offered: 1988-89.)

Biol. 443 3 Credits As Demand Warrants
Microbial Ecology (2+3) n
Laboratory investigation of ecological activity and impact of bacteria and fungi. Isolation and study of important genera. Laboratory fee: $10.00. (Prerequisites: Biol. 342, 271, or 442; or permission of instructor.)

Biol. 452 3 Credits Alternate Spring
Cytogenetics (2+3) n
Chromosome form and function emphasizing gene structure, DNA replication, chromosomal mutation and population cytogenetics. Laboratory fee: $10.00. (Prerequisites: Biol. 362 or permission of instructor. Next offered: 1988-89.)

Biol. 470 3 Credits Alternate Fall
Ecological Genetics (2+3)
Dynamics of gene frequencies and the quantitative genetics of ideal and natural populations, with emphasis on tools and methods of population genetics. Laboratory fee: $10.00. (Prerequisites: Biol. 308 and A.S. 301. Next offered: 1987-88.)

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. 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: $10.00. (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 and bird-habitat relationships. The course consists of preparation during the spring semester followed by a field trip of 10-12 days in early May. Students must share in expenses. Field trip fee to be announced. Laboratory fee: $10.00. (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: 1987-88.)

Biol. 614 2 Credits Alternate Spring
Grazing Ecology (2+0)
(Same as WF 614)
The dynamics of herbivory, emphasizing the grazing process, and including mechanisms of feeding, feeding behavior, habitat and plant selection, physiological influences on feeding, plant and community level responses, plant defenses against herbivory and management of grazing systems. (Prerequisites: graduate standing or approval of instructor. Next offered: 1988-89.)

Biol. 616 3 Credits As Demand Warrants
Principles and Methods of Taxonomy (2+3)
Philosophy and methodology relating to current trends in systematics, particularly morphometric and biochemical systematics. Laboratory fee: $10.00.

Biol. 618 2 Credits Alternate Spring
Biogeography (2+0)
Spatial and temporal geography of plants and animals; emphasis on environmental and historical controls of patterns of distribution. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1987-88.)

Biol. 619 2 Credits Alternate Fall
Marine Mammals (1+3)
Evolution, systematics, morphology, physiology, ecology, and behavior of seals and whales. Laboratory fee: $10.00. (Prerequisites: Graduate standing or permission of instructor. Next offered: 1988-89.)

Biol. 624 3 Credits Alternate Fall
Physiological Ecology: Temperature Regulation and Thermal Adaptation (2+3)
Responses of organisms to their thermal environment. Field research-oriented laboratory. Laboratory fee: $10.00. (Prerequisites: Graduate standing, Biol. 210 or permission of instructor. Next offered: 1988-89.)

Biol. 625 3 Credits Alternate Spring
Physiological Ecology: Energetics and Nutrition (2+3)
A study of physiological processes involved in the interaction of animals with their environment, with special emphasis placed on northern habitats. Energetics and nutrition will cover the nutritional ecology of animals and describe adaptation of organisms to avoid or minimize nutritional imbalance or inadequacy. Laboratory fee: $10.00. (Prerequisites: Graduate standing and an animal physiology course, or permission of instructor. Next offered: 1988-89.)

Biol. 626 3 Credits Alternate Fall
Physiological Ecology: Vertebrate Reproduction (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. Laboratory fee: $10.00. (Prerequisites: Graduate standing and a physiological course and Biol. 271 or permission of instructor. Next offered: 1987-88.)

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: 1988-89.)

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: 1987-88.)

Biol. 638 1 Credit Alternate Fall
Seminar in Ecology and Evolutionary Biology (2+0)
Readings and discussions of topics of current interest in ecology and evolution. (Prerequisite: Graduate standing. Next offered: 1988-89.)

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: 1988-89.)

Biol. 678 3 Credits Alternate Spring
Tropical Ecology Field Course (0+3+Arr)
Intensive field study of the ecology of selected tropical habitats, with emphasis on ecological field methods, plant-animal interactions and ecological problems and processes unique to the tropics. Course consists of two week intensive field work between the fall and spring semesters, followed by weekly lecture/labs during the spring semester. Preregistration in the preceding fall semester is required. (Field trip cost borne by student.) (Prerequisites: Biol. 271, Bot. 239 and one of: Biol. 308 or Bot. 331; graduate student standing or senior with permission of 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. Laboratory fee: $10.00. (Prerequisites: A.S. 301, 401 and either graduate standing in a biologically oriented field or permission of instructor. Next offered: 1987-88.)

Botany

Bot. 239 4 Credits Spring
Plant Form and Function (3+3) n
Structure, function, ecology, and evolutionary patterns of the major groups of plants. Laboratory fee: $10.00. (Prerequisites: Biol. 105-106.)

Bot. 331 4 Credits Spring
Systematic Botany (2+6) n
Classification of flowering plants with emphasis on Alaskan flora; discussion of taxonomic principles and both classical and experimental methods of research. Preregistration is required to insure that each student will prepare a plant collection. Laboratory fee: $10.00. (Prerequisite: Bot. 362 or permission of the instructor. Biol. 252 recommended.)

Bot. 333 3 Credits Alternate Fall
Biology of the Non-Vascular Plants (2+3) n
The structure, function, comparative development, taxonomy, phylogeny and life histories of non-vascular cryptogams (algae, exlcuding blue greens, fungi, lichens, mosses and hepatics). Laboratory fee: $10. (Prerequisite: Bot. 239. Next offered: 1987-88.)

Bot. 334 4 Credits 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: $10.00. (Prerequisite: Bot. 239. Next offered: 1988-89.)

Bot. 416 3 Credits Alternate Spring
Plant Physiology (2+3) n
The physiology of vascular plants, including growth, development, water relations, photosynthesis, transport and metabolism. Laboratory fee: $10.00. (Prerequisites: Bot. 239 and Chem. 106; Biol. 361 and Chem. 321 recommended. Next offered: 1988-89.)

Bot. 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. Laboratory fee: $10.00. (Prerequisites: Bot. 239, Biol. 271, A.S. 301. Next offered: 1988-89.)

Bot. 475 2 Credits Alternate Fall
Plant Communities of Alaska-Field Course (1+3)
A series of field trips to the plant communities of interior Alaska; emphasis on identification of vascular and non-vascular plants and the processes affecting the structure and evolution of Alaskan plant communities. Laboratory fee: $10.00. (Prerequisites: Bot. 239, permission of instructor. Next offered: 1987-88.)

Bot. 476 4 Credits Alternate Spring
World Vegetation and Flora (3+3)
Survey of vegetation and flora of the world; emphasis on latitudinal and elevational patterns, climatic controls, community convergence, and taxonomy and distribution of major plant families. Laboratory fee: $10.00. (Prerequisites: Bot. 239 and Biol. 271 or Bot. 331. Next offered: 1987-88.)

Bot. 674 2 Credits Alternate Spring
Advanced Plant Ecology: Populations and Communities (1+3)
Current issues and concepts of plant ecology emphasizing population and evolutionary ecology, competition, coexistence, and plant community structure and dynamics. Laboratory fee: $10.00. (Prerequisite: Bot. 474 or permission of instructor. Next offered: 1987-88.)

Bot. 675 3 Credits Alternate Fall
Plant Physiological Ecology (2+3)
Physiological ecology of dormancy, germination, growth, photosynthesis, water relations and nutrition with an emphasis on northern and other stressful environments; relationship to community and ecosystem processes. Laboratory fee: $10.00. (Prerequisites: Biol. 210 or Bot. 416; Bot. 474 or permission of instructor. Next offered: 1987-88.)

Bot. 676 3 Credits Alternate Spring
Reproductive Biology of Flowering Plants (3+0)
The biology of plant reproduction including breeding systems, pollination ecology, seed dispersal, plant-animal coevolution, reproductive interactions between plants, the effect of reproductive processes on the structure and function of biotic communities. (Prerequisites: Bot. 239 and one of: Biol. 271, Biol. 308, Bot. 331; graduate standing or consent of instructor. Next offered: 1987-88.)

Business Administration

Admittance to upper division School of Management courses will be granted only to students with junior standing or above who have completed all required 100 and 200 level courses in Accounting, Business Administration, Economics and Mathematics. The exceptions to this include B.A. 301, B.A. 331 and B.A. 332. Any other exceptions require the approval of the B.A. department head.

B.A. 100 3 Credits 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. Materials 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. Materials fee: $20.00. (Prerequisite: B.A. 101 or permission of instructor. Next offered: 1987-88.)

B.A. 220 3 Credits Alternate Fall
Basic Programming Languages (3+0)
Programming in selected computer languages including ASSEMBLER, RPG, and machine language. Materials fee: $20.00. (Prerequisite: B.A. 101. Next offered: 1987-88.)

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. 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
The Legal Environment of Business (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. Materials fee: $20.00. (Prerequisite: Junior standing or permission of instructor.)

B.A. 332 3 Credits Fall and Spring
Business 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. Materials fee $20.00. (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, ~~227~~ Psy 101, Soc 101)

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 Fall
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 As Demand Warrants
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.

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 Spring
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 Fall
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: 1988-89.)

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.)

BA 410 – new course – Systems analysis + Design

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: $10.00. (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. Materials fee: $20.00. (Prerequisites: B.A. 325.)

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.)

Dem 226, 287

BA 441 – new course Romotion Management

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.~~ 325, 336, 369 445)

B.A. 445 3 Credits Fall
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.~~)

BA 343, 486

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. 456 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. Materials fee: $20.00. (Prerequisites: Completion of all 300 level Business Administration, Accounting and Economics common body of knowledge requirements and senior standing in the School of Management.)

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: senior standing. All 300 level requirements completed.)

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: 1987-88.)

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: 1988-89.)

B.A. 475 3 Credits As Demand Warrants
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 Spring
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. 603 3 Credits Fall
The Process and Legal Environment of Management (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. (Prerequisite: Graduate standing.)

B.A. 605 3 Credits Fall
Management Information Systems (3+0)
Application of systems concepts for producing information to be used in business decision making. Use of mainframe computing (VAX) and personal computers in decision support software, e.g. spread sheets, data base systems, etc. Special projects. Materials fee: $20.00. (Prerequisite: Graduate standing.)

B.A. 606 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. Materials fee: $20.00. (Prerequisites: Graduate standing and Math 161-162 or equivalent.)

B.A. 608 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. (Prerequisite: Graduate standing.)

B.A. 625 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.)

B.A. 643 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.)

B.A. 651 3 Credits Spring
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.)

B.A. 661 3 Credits As Demand Warrants
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. 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. 625.)

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. 643.)

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
Contemporary Chemistry: Chemistry of the Elements (3+3) n
Introduction to the fundamentals of chemistry with the development of linguistic and mathematical skills and their application to the descriptive and quantitative study of metals, non-metals and their compounds. The course may be used to meet the general laboratory science requirement or for preparation for Chem. 105 or 121. Laboratory fee: $15.00.

Chem. 104 4 Credits Spring
Contemporary Chemistry: Organic Carbon (3+3) n
Introduction to the fundamentals of chemistry with the development of linguistic and mathematical skills and their application to the descriptive and quantitative study of carbon and its relationship to the chemistry of living systems. The course may be used to meet the general laboratory science requirement or for preparation for Chem. 105 or 121. Chem. 103 is not a prerequisite for Chem. 104. Laboratory fee: $15.00.

Chem. 105 4 Credits Fall and Spring
Chem. 106 4 Credits Fall and Spring
General Chemistry (3+3) n
Chem. 105-106, together, constitute the standard one-year engineering and science-major general chemistry course with laboratory. Chem. 105: Measurements, calculations, atomic and molecular structure, chemical reactions and related energy changes. Chem. 106: Reaction kinetics, equilibrium (including acids and bases), nuclear chemistry, electrochemistry, chemistry of the elements and an introduction to organic and biochemistry. Laboratory fee: $15.00. (Prerequisites: For Chem. 105: high school algebra, high school chemistry or Chem. 103 or 104, or consent of instructor. For Chem. 106: Chem. 105.)

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. Laboratory fee: $15.00. (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. 202 3 Credits Spring
Basic Inorganic Chemistry (2+3) n
Survey of inorganic chemical properties and reactions with special emphasis on the environment. The laboratory includes synthesis, characterization and analysis. (Prerequisite: Chem. 106 or permission of instructor.)

Chem. 212 3 Credits Fall
Chemical Equilibrium and Analysis (3+0) n
A systematic study of aqueous chemical equilibrium as applied to chemical analysis, separations, spectrophotometry, potentionmetry, and factors considered in the analytical approach. (Prerequisites: Chem. 106, Math. 107 or equivalent.)

Chem. 213 1 Credit Fall
Quantitative Analysis Laboratory (0+3) n
Laboratory training in quantitative chemical manipulation, including calibration, standardization, high precision analysis using titrimetric and gravimetric methods. (Prerequisites: Chem. 106 and Math. 107.)

Chem. 321 3 Credits Fall and Spring
Chem. 322 3 Credits Fall and 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 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. Laboratory fee: $15.00. (Prerequisites: Chem. 321 or permission of the instructor.)

Chem. 331 3 Credits Fall
Chem. 332 3 Credits Spring
Physical Chemistry (3+0) n
Chem. 331: Principles of thermodynamics with applications to phase equilibria, solutions, chemical equilibrium and electrochemstry. Chem. 332: Kinetic theory of gases, chemical kinetics, atomic and molecular structure, and spectroscopy. (Prerequisites: Chem. 106, Math 202, Phys. 104 or 212 or permission of the instructor; Chem. 331 for Chem. 332.)

Chem. 402 3 Credits Fall
Inorganic Chemistry (3+0) n
An in-depth survey of modern inorganic chemistry with application of physical chemistry to the study of the elements and their compounds. Major emphasis is on bonding, periodic properties and coordination chemistry. (Prerequisite or corequisite: Chem. 332.)

Chem. 412 3 Credits Spring
Instrumental Analytical Methods (3+0) n
Theory, capabilities and limitations of instruments used in chemical analysis. Subjects include chromatography, mass spectrometry, petentiometry, optical spectroscopy, and nuclear magnetic resonance. (Prerequisites: Chem. 212 and 213; corequisite: Chem. 332.)

Chem. 433 3 Credits Fall
Analytical Instrumental Laboratory (1+6) n
A laboratory course to study the capabilities and limitations of common analytical instruments. Experimental design, critical evaluation of data, and report writing are emphasized. Laboratory fee: $15.00. (Prerequisite: Chem. 212 or corequisite Chem. 331.)

Chem. 434 3 Credits Spring
Physical Instrumental Laboratory (1+6) n
A physical chemistry laboratory emphasizing quantitative instrumental measurements: calorimetry, conductance, polarimetry; IR, NMR, x-ray, and Raman spectroscopy. Laboratory fee: $15.00. (Prerequisite: Chem. 433.)

Chem. 451 3 Credits Fall
General Biochemistry (3+0)
Chemistry of biomolecules with emphasis on the bioenergetics and control of metabolic pathways via regulation of specific enzymes. (Prerequisites: Chem. 322; Chem. 331 and 322 recommended or permission of the instructor.)

Chem. 452 3 Credits Spring
Biochemistry Laboratory (1+6)
An introduction to the experimental manipulation and observation of enzymes, proteins, and nucleic acids, using chromatographic, spectroscopic, electrophoretic, and other techniques. (Prerequisite: Chem. 451.)

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 with emphasis on modern instrumental analytical methodology and chemometrics. (Prerequisite: Chem. 332. Next offered: 1987-88.)

Chem. 621 3 Credits As Demand Warrants
Physical Organic Chemistry (3+0)
Application of the principles of physical chemistry of organic molecules and reactions. Topics include kinetics, thermodynamics, spectroscopy, pericycliic processes, and reaction mechanisms. (Prerequisite: Chem. 322; corequisite: Chem. 332.)

Chem. 622 3 Credits As Demand Warrants
Advanced Organic Chemistry II (3+0)
Contemporary topics in organic chemistry drawn from the areas of synthesis, reactivity, and bio-organic chemistry. Variable content. May be repeated for credit. (Prerequisite: Chem. 322.)

Chem. 631 3 Credits Alternate Spring
Advanced Physical Chemistry (3+0)
Introduction to quantum chemistry. (Prerequisite: Chem. 332.)

Chem. 632 3 Credits As Demand Warrants
Molecular Spectroscopy (3+0)
Application of quantum mechanics to molecular bonding and spectroscopy. (Prerequisite: Chem. 332.)

Chem. 652 3 Credits — Alternate Spring
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: 1987-88.)

Chem. 660 3 Credits — Spring
Chemical Oceanography (3+0)
(Same as MSL 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) chg description
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.~~ Math 108)

C.E. 326 4 Credits — Fall and Spring
Introduction to Geotechnical Engineering (3+3)
Introduction to the fundamentals of geotechnical engineering including both soil mechanics and foundation engineering. Identification and classification of soil, physical and mechanical properties of soil, subsurface exploration and laboratory testing techniques, seepage, compaction, bearing capacity, slope stability, deep and shallow foundation design, retaining structure design, frozen ground consideration. (Prerequisites: E.S. 331, ES 341, CE 334 or permission of the instructor.)

C.E. 334 3 Credits — Fall
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. Laboratory fee: $10.00. (Corequisite: E.S. 331.)

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. Materials fee: $10.00. (Prerequisite: E.S. 341.)

C.E. 400 0 Credits — Fall and Spring
EIT Exam
Complete the EIT application and take the State of Alaska Engineering-in-Training Exam in the same semester of course registration. (Prerequisites: Senior Standing, Civil Engineering.)

C.E. 402 3 Credits — Fall
Introduction to Transportation Engineering (3+0)
Introduction to fundamentals of transportation engineering. Transportation systems, planning, design parameters, demand and mode specific consideration. Laboratory fee: $10.00. (Prerequisites: C.E. junior standing or permission of instructor.)

C.E. 403 3 Credits — Fall
Traffic Engineering (2+3)
Analysis and design of highways, streets and intersections for traffic consideration. (Prerequisite: C.E. 402)

C.E. 404 3 Credits — Spring
Highway Engineering (2+3)
Engineering considerations for highway design including vertical and horizontal alignment, cross sections, drainage, pavements, earthworks, signs and markings, intersection and interchange. (Prerequisites: C.E. 402, C.E. 415.)

C.E. 412 3 Credits — Alternate Spring
Elements of Photogrammetry (2+3) chg discription
Elementary study of aerial and terrestrial photographs as applied to surveying and mapping. (Prerequisite: permission of the instructor. Next offered: ~~1987-88.~~ 1989-90)

C.E. 415 3 Credits — Fall
Advanced Surveying (2+3) chg des.
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. 326, E.S. 301.)

C.E. 425 3 Credits — Fall
Advanced 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. Laboratory fee: $10.00. (Prerequisite: C.E. 326, E.S. 301.)

C.E. 431 3 Credits — Spring
Structural ~~Analysis~~ (3+0) Engineering I
Analysis of statically determinate and indeterminate structures to include: beams, trusses and frames. Internal force resultants, shear and moment diagrams, deflections, internal stresses. Influence lines and criteria for moving loads. Indeterminate analysis to include methods of consistent deflections, slope deflection and moment distribution. Introduction to matrix methods. (Prerequisites: C.E. 334, E.S. 331.)

C.E. 432 ~~3~~ Credits — Fall
Structural ~~Systems Design~~ (2+0) Engineering II
Introduction to structural design. Emphasis is given to structural systems rather than component design. Comparison of various structural systems, material characteristics and subsystem options used to meet design requirements. Elementary review of appropriate design codes for steel, reinforced concrete and timber. Introduction to component design. (Prerequisite: ~~C.E. 326, E.S. 301.~~ CE 431)

C.E. 433 3 Credits — Fall
Reinforced Concrete Design (2+3)
Analysis and design of reinforced concrete components. Design philosophies and current practice. Short and long columns, beam-columns, flexural members, to include: rectangular and T-beams, one and two-way slabs. Footings. Crack control, anchorage, development lengths and deflections. Introduction to complete structural systems. Current ACI specifications used. (Prerequisite: C.E. 431.)

C.E. 434 3 Credits — Spring
Timber Design (2+3)
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 and C.E. 431.)

C.E. 436 3 Credits — Spring
Structural Steel Design (2+3)
Analysis and design of structural steel components. Design philosophies and current practice. Columns, tension members, laterally supported and unsupported beams and beam-columns. Local and global instabilities. Welded and bolted connections. Introduction to complete structural systems. Current AISC specifications used. Prerequisite: C.E. 431.)

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. Laboratory fee: $10.00. (Prerequisite: E.S. 341 or permission of instructor.)

C.E. 442 3 Credits — Spring
Environmental Engineering II (3+0)
Advanced topics in environmental engineering. Each of the following subjects will be allocated about an equal portion of time for topic coverage. Environmental law and health, air pollution, solid waste management, toxic and hazardous wastes, animal waste management, noise pollution, water quality modeling, wastewater collection systems, chemical/physical processes, theory of sedimentation, disinfection, biological processes, onsite treatment, sludge management, advanced waste treatment and other. (Prerequisites: C.E. 441 and junior C.E. standing.)

C.E. 445 3 Credits Fall
Engineering Hydrology (2+3)
Engineering hydrology, design and analysis; extended coverage of hydrologic concepts from C.E. 344. Precipitation, evaporation analysis; groundwater hydraulics; runoff analysis and prediction; statistical hydrology; application of simulation models. (Prerequisite: C.E. 344.)

C.E. 446 3 Credits Spring
Hydraulic Engineering (2+3)
Hydraulic design and analysis. Review of principles of fluid mechanics pipe network modeling, hydraulic systems (pumps and turbines), steady and unsteady flow in open channels, hydraulic structures, similitude. (Prerequisite: C.E. 344.)

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. Materials fee: $10.00. (Prerequisite: Graduate standing or permission of instructor.)

C.E. 605 3 Credits Alternate Spring
Pavement Design (3+0)
Current design techniques for flexible and rigid pavements. Materials characterization, loading considerations, empirical design methods, mechanistic design methods, rehabilitation. (Prerequisites: Graduate standing and C.E. 402 or consent of instructor. Next offered: 1988-89.)

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: 1987-88.)

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: 1988-89.)

C.E. 622 3 Credits Alternate Fall
Foundations and Retaining Structures (3+0)
Advanced study of shallow and deep foundations, retaining structures and buried pipes. (Prerequisites: C.E. 435 and C.E. 422 or consent of instructor. Next offered: 1987-88.)

C.E. 625 3 Credits Alternate Fall
Soil Stabilization (3+0)
Soil and site improvement using deep and shallow compaction, additives, preloading, vertical and horizontal drains, electro osmosis and soil reinforcement. (Prerequisite: C.E. 435 or consent of instructor. Next offered: 1987-88.)

C.E. 626 3 Credits Alternate Fall
Applications in Geotechnical Engineering (3+0)
Selected topics in geotechnical engineering studied in content with case histories. (Prerequisites: C.E. 326, C.E. 422 and C.E. 435 or consent of instructor. Next offered: 1987-88.)

C.E. 627 3 Credits Spring
Earthquake Engineering I (3+0)
Fundamentals of geotechnical earthquake engineering: wave propagation in soils; dynamic soil properties; influences of soils on ground motion; determination of soil response under strong seismic motion; causes of soil failures, soil liquifaction, soil settlement, soil-structure interaction and slope stability; analysis and design of dams, earth structures and foundation systems. (Prerequisite: C.E. 326.)

C.E. 631 3 Credits Fall
Advanced Structural Analysis (3+0)
Derivation of the basic equations governing linear structural systems. Application of stiffness and flexibility methods to trusses and frames. Solution techniques utilizing digital computer. Introduction to structural dynamics.

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: 1988-89.)

C.E. 637 3 Credits Fall
Earthquake Engineering II (3+0)
Fundamentals of structural earthquake engineering: strong ground motion phenomena; dynamic analysis of structural systems for seismic motion; response spectrum and time history methods, design of structural systems for lateral forces; shearwalls and diaphragms; moment-resistive frames, braced frames; current design criteria and design practice; connection details, serviceability requirement; story drift, non-structural building elements; soil-structure interaction. (Prerequisite: C.E. 432.)

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: 1987-88.)

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: 1988-89.)

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: 1987-88.)

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: 1987-88.)

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: 1987-88.)

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: 1988-89.)

C.E. 685 3 Credits Alternate Spring
Topics in Frozen Ground Engineering (3+0)
Selected frozen ground foundation engineering problems will be explored in depth including refrigerated foundations and pile foundations. (Prerequisite: C.E. 681. Next offered: 1988-89.)

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: 1988-89.)

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. (Prerequisite: Two years of high school mathematics, including at least one year of algebra.)

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. 271 3 Credits — Spring
Scientific Programming in FORTRAN (3+0)
Syntax and principles of the FORTRAN programming language. Applications to problems in science and engineering including the solution of linear and non-linear equations, interpolation, numerical integration, monte-carlo techniques and the use of mathematical subroutine libraries. (Prerequisites: One semester of calculus and previous programming experience or consent of instructor.)

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. 200, and Math. 210.)

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 314. Next offered: 1988-89.)

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. 1987-88.)

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: 1988-89.)

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: 1987-88.)

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: 1988-89.)

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: 1987-88.)

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, decidability. (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 — As Demand Warrants
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 Fall
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 adviser.)

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 Spring
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 adviser.)

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 adviser. 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 4 Credits Fall
Principles and Techniques of Individual Counseling (3+3)
(Same as Psy. 660)
A survey of the major theoretical systems of counseling and a limited practice in basic techniques. Major systems include cognitive, behavioral, psychodynamic, perceptual-phenomenological, and existential approaches. Actual practice in techniques of listening, helping, session management, problem identification, and goal setting. (Prerequisites: Coun. 615 and/or permission of instructor.)

Coun. 624 3 Credits Spring
Group Counseling (3+0)
(Same as Psy. 674)
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 and/or permission of instructor.)

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 appropriate school 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 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: 1988-89.)

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 104 3 Credits Fall and Spring
University Communications (3+0)
Designed to introduce communication skills that are characteristic of university contexts (e.g., taking notes from lectures) and to address cultural differences between rural students and the university community. Links with selected lecture course. (Prerequisite: Referral from Rural Student Services.)

CCC 105 3 Credits Fall and Spring
Intensive Reading Development (3+0)
Develops and refines vocabulary, comprehension, and critical reading at the college level. Instruction focuses on developing readers' ability to use a wide range of comprehension strategies to enhance reading effectiveness. (Prerequisite: Referral from Rural Student Services.)

CCC 106 3 Credits Fall and Spring
Intensive Writing Development (3+0)
Emphasizes differences between speaking and writing, focusing on rhetorical patterns and style appropriate for formal writing in a university context. Prepares students for English 111. (Prerequisite: Referral from Rural Student Services.)

CCC 107 3 Credits Spring
Intensive Writing Development II (3+0)
Designed to further prepare students for English 111 by focusing extensively on essay writing. Includes the writing and production of *Theata* magazine. (Prerequisite: Referral from Rural Student Services.)

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 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. If taken as a television course, there is a $20.00 telecourse fee.

Econ. 202 3 Credits Fall and Spring
Principles of Economics II: Macroeconomics (3+0) s
Analysis and theory of national income, money and banking, and stabilization policy. If taken as a television course, there is a $20.00 telecourse fee.

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. (Prerequisite: Math. 107-108 or Math. 161.)

Econ. 227 3 Credits 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 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: $10.00 (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. 201 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 1987-88.)

Econ. 409 3 Credits As Demand Warrants
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.)

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 As Demand Warrants
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.)

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 As Demand Warrants
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: 1987-88.)

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. 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. 611 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. 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: $10.00. (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. 275 3 Credits Fall and Spring
Introduction to Microcomputers for Teachers (3+0)
This course will provide information about and understanding of computer technology and its present and potential impact on the field of education. Students will learn basic microcomputer terminology and operation, be introduced to a variety of classroom applications of computer technology, and develop judgement skills related to hardware and software utilization in the classroom. (Prerequisites: Ed. 201 or concurrent enrollment in Ed. 201.)

Ed. 303 3 Credits As Demand Warrants
Language and Literacy Development (3+0)
(Same as Ling. 303)
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 (3+0)
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. 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 creative writing. 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. (Prerequisites: Psy. 240: concurrent enrollment in Psy. 240/Ed. 330 permissible for students with senior standing or earned degree.)

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. 375 3 Credits Fall and Spring
The Exceptional Learner (3+0)
An overview course which develops the foundation for understanding, identifying and serving the exceptional learner in rural and urban settings. A special emphasis is placed on working with exceptional learners in the regular classroom. The unique needs of exceptional students in rural settings from bilingual/multicultural backgrounds is a part of the course. (Prerequisites: Ed. 201 and Psy. 240.)

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-381 - Foundation of Lit. Devel

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: Ed. 201; admission to Teacher Education Program. This course should be taken the semester prior to Ed. 453.)

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. 419 6 Credits Fall and Spring
Integrated Methods and Curriculum Development (3+9)
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: Math 205, Psy. 240, Ed. 330, concurrent enrollment with Ed. 423. Should be taken semester prior to student teaching.)

ED 421 - Study for Reading + Writing

Ed. 423 6 Credits Fall and Spring
Reading, Language and Literacy (4+6)
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 (2+3)
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. 201; admission to Teacher Education Program. This course should be taken the semester prior to Ed. 453.)

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. 201; admission to Teacher Education Program. This course should be taken the semester prior to Ed. 453.)

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 (2+3)
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. (Prerequisites: Ed. 201; admission to Teacher Education Program. This course should be taken the semester prior to Ed. 453.)

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 1-9 Credits Fall and Spring
Practicum in Education
Practical application of general ideas and techniques addressed in the methods courses in which the student is currently enrolled or previously completed. (Prerequisites: Ed. 201; Ed. 330; Ed. 402 or equivalent; concurrent enrollment permitted with Ed. 402; 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. (Prerequisites: See requirements for admission to student teaching.)

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.)

Ed. 454 12 Credits Fall and Spring
Student Teaching K-12 (1+33)
Supervised teaching in both elementary and secondary schools approved by the department of education. Open only to Music and P.E. majors seeking K-12 certification. The department may limit registration, determine assignments, and cancel the registration of students doing unsatisfactory work. Students should be expected 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.) or to graduate students

Ed. 456 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: permission of instructor.)

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 integrating 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: 1988-89.)

Ed. 490 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.)

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, Ed. 610.)

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, Ed. 610, 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. 633 3 Credits Fall
Computer Tools for Teachers: Word Processing and Telecommunications (1+6)
Development of strategies for using microcomputer word processing and telecommunications to facilitate the learning of elementary and secondary school students. Methods for utilizing word processing within the regular classroom setting and exploration of the potentials of computer bulletin board systems (BBS's), information utilities, and bibliographic data bases are included. (Prerequisites: Ed. 275 or equivalent.)

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 1987-88.)

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/her 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. 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. (Prerequisites: 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. (Prerequisite: 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. (Prerequisite: 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. (Prerequisite: 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: 1988-89.)

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. (Prerequisite: 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.)

Ed. 691 3 Credits Fall
Contemporary Issues in Education (3+0)
A critical overview of the current status of the field of education. Students will participate in a thorough investigation of select problems, trends, and issues that presently characterize the institution of public education. Seminar sessions will focus on student research regarding the development, present impact and potential implications of each topic discussed. (Prerequisite: Graduate standing.)

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. Laboratory fee: $25.00. (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. Laboratory fee: $25.00. (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. Laboratory fee: $25.00. (Prerequisite: E.E. 204.)*

E.E. 311 3 Credits Fall
Applied Engineering Electromagnetics (3+0)
Analysis and design of transmission lines and distributed linear circuits using impedance concepts. Development of electromagnetic field equations and their relation to circuit models. Magnetostatics and the magnetic circuit. Electromagnetic wave propagation. Application of the wave equation to engineering systems. (Prerequisites: Phys. 211, Math 302, E.E. 204.)

E.E. 312 3 Credits Spring
Electromagnetic Waves and Devices (3+0)
Theory and design of antennas, waveguides and other periodic structures. Antenna arrays, broadband design techniques and related topics. Theory and design of practical communication links. (Prerequisites: E.E. 311, E.E. 331, Math 302.)

E.E. 331 1 Credit Fall
High Frequency Lab (0+3)
Laboratory experiments in transmission lines, impedances, bridges, scattering parameters, hybrids, and waveguides. Laboratory fee: $25.00. (Corequisite: E.E. 311.)*

E.E. 332 1 Credit Spring
Electromagnetics Laboratory (0+3)
Use of Maxwell's equations in the analysis of waveguides, cavity resonators, transmission lines,antennas, and radio propagation. Laboratory fee: $25.00. (Corequisite: E.E. 312.)

E.E. 333 4 Credits Fall
Physical Electronics (3+3)
Basic properties of semiconductors. Principles of semiconductor devices diodes, transistors, and integrated circuits. Laboratory fee: $25.00. (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. Laboratory fee: $25.00. (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. Laboratory fee: $25.00. (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. Laboratory fee: $25.00. (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. Laboratory fee: $25.00. (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. Laboratory fee: $25.00. (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. Laboratory fee: $25.00.** (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. Laboratory fee: $25.00.** (Prerequisite: E.E. 442.)
**A student registering for both E.E. 442 and E.E. 443 will be assessed a fee of $150.00 at the beginning of the Fall Semester for E.E. 442. The $150.00 fee does not apply to a student registering for only E.E. 442; however, a student who does not take E.E. 442 at UAF, but who enrolls in E.E. 443 will be assessed the $150.00 fee at the time of registration. In all cases, the $150.00 fee is in addition to the standard $25.00 lab fee.

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. Laboratory fee: $25.00. (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. Laboratory fee: $25.00. (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. Laboratory fee: $25.00. (Prerequisites: E.E. 354 and senior standing.)

*Certain prerequisites may be waived by instructor under special circumstances.

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. 354 and senior standing.)

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. Laboratory fee: $25.00. (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. Laboratory fee: $25.00. (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. 604 3 Credits As Demand Warrants
Electric Power System Modeling and Transients (3+0)
Power system transient analysis, use of the Electromagnetic Transients Program (EMTP), insulation coordination, transient recovery voltage phenomena, and resonance conditions. (Prerequisites: E.E. 406 or permission of instructor.)

E.E. 632 3 Credits As Demand Warrants
Quantum Electronics (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. 461.)*

E.E. 664 3 Credits As Demand Warrants
Data Communication Techniques (3+0)
Examination of techniques used in modern data communications systems. Analysis and design of data networks. Routing, traffic control, and error control techniques. (Prerequisites: E.E. 464 or permission of instructor.)

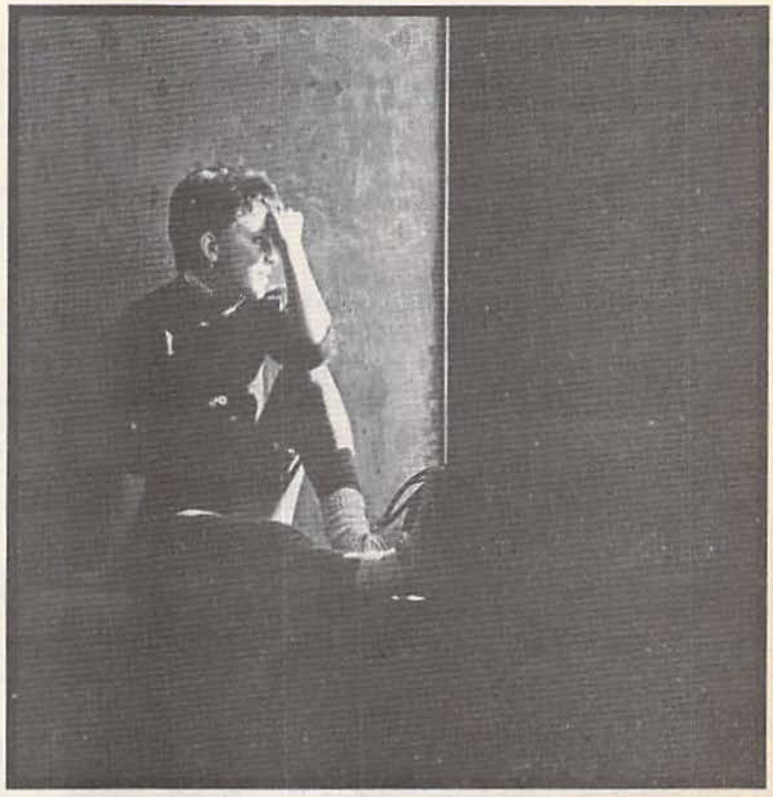
E.E. 671 3 Credits As Demand Warrants
Digital Control Systems (3+0)
Study of digital control theory. Topics will include signal conversion, Z-transforms, state variable techniques, stability, time and frequency domain analysis and system design. (Prerequisites: E.E. 471 or permission of instructor.)

UAF... Challenging the mind

(Top)
Freshman Jennifer Moss from Juneau, Alaska, rests between classes in a windowsill in Wood Center.

(Bottom)
Journalism student Doug Schneider works part time for the UAF grounds crew. In early spring, Schneider and others clear the snow from the Constitution Park flowerbed.

(Facing Page)
Alder twigs glisten from frost accumulated during the winter. This photo was taken in the university's Bonanza Creek Experimental Forest, about 30 miles west of Fairbanks.



and the spirit...

Engineering Science

E.S. 101 2 Credits Fall and Spring
Graphics (1 + 4)
Lettering, freehand drawing and sketching, proper use of drawing equipment, orthographic, isometric, oblique and perspective drawings, descriptive geometry, graphic solutions and computer aided drawing (CAD).

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. Laboratory fee: $10.00. (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 Phys. 211.)

E.S. 209 3 Credits Fall and Spring
Statics (3 + 0)
Study of force systems in two and three dimensions. Composition and resolution of forces and force systems; principles of equilibrium applied to various bodies, simple structures, friction, centroids, moments of inertia. Vector algebra used where appropriate. (Prerequisite: Math 201; Corequisite: Phys. 211.)

E.S. 210 3 Credits Fall and Spring
Dynamics (3 + 0)
Study of the motion of particles, kinematics and kinetics of plane motion of rigid bodies, and principles of work and energy, impulse and momentum. Vector methods used where appropriate. (Prerequisite: E.S. 209.)

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. (Prerequisites: Math. 302, E.S. 210.)

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. Laboratory fee: $25.00. (Prerequisite: Math. 202, or permission of the instructor.)

E.S. 308 3 Credits Spring
Instrumentation and Measurement (2 + 3)
Instrumentation theory and concepts of digital and analog devices, transducers, data sensing transmission, recording, and display, instrumentation system, remote sensing, and hostile environmental conditions. Laboratory fee: $25.00. (Prerequisite: E.S. 307.)

E.S. 331 3 Credits Fall and Spring
Mechanics of Materials (2 + 3)
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 or E.S. 209, and 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: 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. Laboratory fee: $10.00. (Prerequisites: Math. 201, and E.S. 208 or E.S. 210.)

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.)

E.S. 429 3 Credits Fall
Ethics and Liability in Professional Practice (2 + 3)
The professional, moral, ethical, and legal responsibilities of a professional in today's society and workplace. (Prerequisite: Senior or graduate standing or consent of instructor.)

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. 601 3 Credits Fall
Engineers in Organizations (3 + 0)
Development of organizations and techniques appropriate to engineering and scientific activity and personnel to organize, motivate, evaluate, develop and coordinate for maximum effectiveness, with due consideration to the goals of individuals. (Prerequisite: B.S. degree in engineering or physical science or consent 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: 1987-88.)*

E.S.M. 620 3 Credits Every Third Semester
Statistics for E.S.M. (3 + 0)
Forecasting applications and techniques - technological, time series, judgmental and regression; decision trees; Bayesian statistics; utility theory with trade-offs between expected value and risk in decision making; bidding strategies; data analysis emphasizing goodness-of-fit; and the use of statistical software. (Prerequisites: A.S. 301 or equivalent and Math. 202 or equivalent. Next offered: Spring 1988.)*

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.*

*Undergraduate engineering students who are taking graduate E.S.M. courses as technical electives should have completed or be concurrently enrolled in E.S.M. 450.

English

The written communication requirement for any baccalaureate degree is the successful completion of Engl. 111 and Engl. 211 or 213 or equivalent.

A student may elect to fulfill one half of the composition requirement by completing credit by examination in one of the required English courses. Permission of the Director of Communications in the English Department is required to begin all challenge procedures.

Students with extensive backgrounds in literature and composition or with outstanding test scores on nationally recognized examinations (an ACT score of 26 or higher, for example) may challenge both Engl. 111 and 211 or 213. Normally students will be required to complete a successful challenge of Engl. 111 before taking or challenging Engl. 211 or 213.

Required composition courses may also be taken through the University of Alaska Correspondence Study Department.

Engl. 100 3 Credits Fall and Spring
Elementary English (3+0)
Intensive practice in a variety of language skills for students inadequately prepared for Engl. 111. Course will not fulfill the general degree requirement in written communication; it will provide elective graduation credit. (Prerequisite: Placement examination or student desire to enroll.)

Engl. 111 3 Credits Fall and Spring
Methods of Written Communication (3+0) w
Instruction in writing expository prose, including generating topics as part of the writing process. Practice in developing, organizing, revising, and editing essays. (Prerequisite: Placement examination or English 100.)

Engl 190H - Honors Engl Comp (W)

Engl. 211 3 Credits Fall and Spring
Intermediate Exposition, with Modes of Literature (3+0) w
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) w
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+Var.)
Engl. 231 3-7 Credits Spring
English Language Proficiency (3+Var.)
Intensive listening, speaking, reading, and writing in English. 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-Fiction (3+0) h
A study of the forms and techniques of fiction for beginning students; discussion of students' work in class and in individual conferences. (Prerequisite: Engl. 111 or permission of instructor.)

Engl. 272 3 Credits Spring
Introduction to Creative Writing-Poetry (3+0) h
A study of the forms and techniques of poetry for beginning students; discussion of students' work in class and in individual conferences. (Prerequisite: Engl. 111 or permission of instructor.)

Engl 290H - Summer Backpack Book Hole (H)

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. 306 3 Credits Spring
Survey of American Literature (3+0) h
Comprehensive study of American thought as reflected in its major writers, including works representative of American Calvinism, Rationalism, Transcendentalism, Romanticism, Realism, Naturalism, and Modernism. (Prerequisite: Engl. 111 or permission of instructor.)

Engl. 308 3 Credits Fall
Survey of British Literature: Beowulf to the Romantic 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.)

Engl. 309 3 Credits 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.)

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. 313 3 Credits Spring
Writing Non-Fiction Prose (3+0) h
Forms and techniques of non-fiction prose, analysis of selected works and readings in criticism. Course will not fulfill the second half of the general degree requirement in written communication. (Prerequisites: Engl. 211 or 213 or permission of instructor.)

Engl. 314 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 not fulfill the second half of the requirement in written communication. (Prerequisites: Junior standing and Engl. 211 or 213 or permission of instructor).

Engl. 318 3 Credits Fall and Spring
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 340 - New Course (Cross-Cultural ANS)

Engl. 349 3 Credits Fall
Narrative Art of Alaska Native Peoples (in English Translation) (3+0) h
Survey of traditional and historical tales by Aleut, Eskimo, Athabaskan, Eyak, Tlingit, Haida, and Tsimshian storytellers. Attention to bibliography, Alaska Native genres and viewpoints, and structural and thematic features of tales. (Prerequisite: Engl. 111 or permission of instructor.)

Engl. 350 3 Credits Alternate Fall
Literature of Alaska and the Yukon Territory (3+0) h
Study of representative works of fiction, verse, and non-fiction which deal with Alaska and the Yukon Territory. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1987-88.)

Engl. 371 3 Credits Fall and Spring
Intermediate 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. 271 or Engl. 272 or permission of instructor.)

Engl. 403 3 Credits Every Third Spring
American Renaissance (3+0) h
Study of American Literature of the mid-nineteenth century: Poe through Whitman. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1989-90.)

Engl. 404 3 Credits Every Third Spring
American Realism (3+0) h
Study of American literature from the Civil War to World War I: Twain through James. (Prerequisite: Engl. 111 or permission of instructor. Engl. 307 desirable but not required. Next offered: 1987-88.)

Engl. 405 3 Credits Every Third Fall
British Writers of the 19th Century: Romantic Period (3+0) h
Study of English literary romanticism including authors such as 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: 1987-88.)

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: 1988-89.)

Engl. 407 3 Credits Every Third Fall
British Writers of the Restoration and 18th Century: Neo-Classical Period (3+0) h
Study of new developments in drama, verse, and prose reflecting new forces in government, religion, and society during the Augustan Age. Attention to the mode of satire and to the fashion of sentimentalism in all genres. Authors to include (but not limited to): Dryden, Defoe, Addison, Steele, Swift, Pope, Johnson, Boswell, Goldsmith, and Sheridan. (Prerequisites: Engl. 111 and junior standing or permission of instructor. Engl. 308 recommended. Next offered: 1989-90.)

Engl. 408 3 Credits Every Third Spring
American Origins. (3+0) h
Study of the writers who contributed to the development of a national literary identity: Bradstreet through Cooper. (Prerequisites: Engl. 111 and junior standing or permission of instructor. Engl. 307 recommended but not required. Next offered: 1988-89.)

Engl. 414 3 Credits Fall
Research Writing (3+0) h
Practice in reporting primary and secondary research in the forms and styles appropriate to the student's field. Preference given to seniors. (Prerequisite: Engl. 111 and 211 or 213 or their equivalent.)

Engl. 421 3 Credits Every Third 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: 1989-90.)

Engl. 422 3 Credits Fall
Shakespeare: History Plays and Tragedies (3+0) h
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 Every Third Fall
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: 1987-88.)

Engl. 444 3 Credits Every Third Spring
Fiction in Translation (3+0) h
Major fiction in English translation. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1987-88.)

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: 1988-89.)

Engl. 446 3 Credits Alternate Spring
Major Modern and Contemporary Poetry (3+0) h
Yeats to the present. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1987-88.)

Engl. 447 3 Credits Alternate Spring
20th-Century British Prose (3+0) h
Study of fiction and nonfiction prose, modern and contemporary. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1987-88.)

Engl. 448 3 Credits Alternate Spring
20th-Century American Prose (3+0) h
Study of fiction and nonfiction prose, modern and contemporary. (Prerequisite: Engl. 111 or permission of instructor. Next offered: 1988-89.)

Engl. 452 3 Credits Every Third 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: 1987-88.)

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: 1987-88.)

Engl. 471 3 Credits Fall and Spring
Undergraduate Writers' Workshop (3+0) h
Discussion of craft and techniques and student work intended for advanced students who will prepare a brief, finished manuscript as a final project. May be repeated one time for credit. (Prerequisites: Engl. 371 or permission of instructor.)

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: 1988-89.)

Engl. 485 3 Credits Spring
Teaching Composition in the Schools (3+0)
Theoretical background and workshop experience for teaching composition in middle and high schools with current pedagogy on teaching of writing stressed. A variety of teaching methods will be demonstrated and discussed. Writing, teaching demonstrations, reports, group and class discussions are required. (Prerequisites: Completion of university composition requirement with grade of B or higher, or permission of instructor.)

Engl. 601 3 Credits Spring
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 As Demand Warrants
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.)

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: 1988-89.)

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: 1987-88.)

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: 1988-89.)

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: 1989-90.)

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: 1989-90.)

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. (Prerequisites: Engl. 313 and 371 and permission of instructor; or, permission of the head of Department of English and of instructor. Preference will be given to M.F.A. candidates in creative writing.)

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: 1987-88.)

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: 1988-89.)

Engl. 683 3 Credits As Demand Warrants
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.)

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: 1987-88.)

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.)

Engl. 692 Credits Arr. Fall and Spring
Graduate Seminar
Intensive study of selected topics in the discipline.

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. Laboratory fee: $20.00. (Prerequisite: Permission of instructor. Next offered: Fall 1989.)

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. Materials fee: $10.00. (Prerequisite: Permission of instructor. Next offered: Spring 1988.)

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. Materials fee: $15.00. (Prerequisite: Permission of instructor. Next offered: Fall 1989.)

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: Fall 1987.)

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: Fall 1987.)

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: Spring 1988.)

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
Yupik Literacy (3 + 8)
Literacy training for speakers of Yupik languages (Central Yupik, 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
Esk. 212 3 Credits Spring
Intermediate Inupiaq Eskimo (3 + 0) h
Continuation of Eskimo 111-112, concentrating on development of conversational ability, with presentation of additional grammar and vocabulary.

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 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 As Demand Warrants
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.

French

(For UAF program in France, see International Programs.)
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: 1987-88; Fren. 303: 1988-89.)

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: 1987-88.)

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: 1988-89.)

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 and Spring
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: 1987-88.)

Geog. 205 3 or 4 Credits Fall
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 Alternate Fall
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. Next offered: 1988-89.)

Geog. 302 3 Credits 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: 1987-88.)

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: 1988-89.)

Geog. 309 3 Credits Alternate Spring
Cartography (1+6) s
Graphic techniques for presenting geographic data through the construction of maps, projections and charts. (Prerequisite: Permission of instructor. Next offered: 1987-88.)

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: 1988-89.)

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 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.)

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: 1988-89.)

Geog. 402 3 Credits Alternate Fall
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: 1987-88.)

Geog. 404 3 Credits Alternate Fall
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: 1987-88.)

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: 1988-89.)

Geog. 408 3 Credits Alternate Spring
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. Next offered: 1988-89.)

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)
Study of common rocks and minerals, landforms, erosion. Geologic materials and engineering application of geology. (Prerequisite: Geology, science, or engineering majors, or permission of instructor.)

G.E. 365 3 Credits Fall
Geological Engineering I (3+0)
Geological and geotechnical factors for the solution of engineering problems. Special emphasis on soils and permafrost. Some fieldwork and student report. (Prerequisites: Geos. 101 or Geos./G.E. 261 and E.S. 208 or E.S. 209.)

G.E. 372 3 Credits Spring
Rock Engineering (3+0)
Rock engineering related to tunnels, slope design, and strata control. Some field work and student report. (Prerequisites: Geos. 101 or Geos./G.E. 261 and E.S. 208 or E.S. 209.)

G.E. 375 3 Credits Fall
Terrain Analysis (3+0)
Evaluation of terrain characertistics using basic geomorphic and engineering principles. Consideration given to Alaskan 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)
Study of hydraulic characteristics of earth materials, engineering problems and models related to subsurface fluids, and properties of water. (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: 1988-89.)

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: 1987-88.)

G.E. 471 3 Credits Spring
Remote Sensing for Engineering (3+0)
Applications of remote sensing to geological engineering problems. Introduction to digital satellite image processing with hands-on practice. (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 study of geological and engineering factors for the solution of engineering problems. A term project is required. (Prerequisites: G.E. 365, G.E. 375 or permission of instructor.)

G.E. 630 3 Credits Alternate Fall
Advanced Applied Mining Geology (2+3)
Investigative procedures used in mining geology from preproduction to terminal phases of an operation. Models ranging from open-pit to deep underground mining will be examined. Methods of mapping, sampling, on-going evaluation, and geotechnical aspects of water and ground control are examined. (Prerequisites: G.E. 435, Geos. 432, and Geos. 432L. Next offered: 1988-89.)

G.E. 631 3 Credits Spring
Electron Microprobe Methods (2+3)
Applications of electron micro-analysis to mineralogy, petrology, mineral exploration development, evaluation and processing. Physics of x-rays, x-ray spectrometry and measurement; qualitative and quantitative elemental analysis using wave length and energy dispersive spectra are considered. (Prerequisites: M.Pr. 418B)

G.E. 633 3 Credits Fall
Fluid Inclusion Methods in Mineral and Petroleum Exploration (2+3)
Study of fluid inclusions in minerals. Thermodynamics, chemical and physical properties of fluids trapped in rock forming minerals or petroleum bearing rocks. Laboratory work includes sample preparation, thermometric and direct-current plasma emission spectrographic analysis. (Prerequisites: Chem. 331)

G.E. 635 3 Credits Spring
Geostatistical Ore Reserve Estimation (2+3)
(Same as Min. 635)
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.)

G.E. 666 3 Credits Alternate Fall
Advanced Engineering Geology (2+3)
The interaction between geology and engineering case histories, student reports. (Prerequisites: Graduate standing, G.E. 365 and G.E. 372 or permission of instructor. Next offered: 1988-89.)

G.E. 668 3 Credits Alternate Spring
Tunneling Geotechniques (3+0)
Tunnel design, case histories, student report. (Prerequisites: Graduate standing in geological engineering or permission of instructor. Next offered: 1988-89.)

Geoscience (Geology and Geophysics)

Geos. 101 3 Credits Fall and Spring
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 and Spring
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. 212 3 Credits Spring
Geology of Alaska (3+0)
An overview of the geology of Alaska for non-majors. Modern geologic processes in Alaska will be used as a basis for understanding past geologic evolution of the region. The origin and recovery of Alaska's petroleum and mineral resources will be discussed. (Prerequisites: Geos. 101.)

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. Laboratory Fee: $10.00. (Prerequisite: Geos. 213.)

Geos. 261 3 Credits Spring
General Geology for Engineers (2+3) n
(Same as G.E. 261)
Study of common rocks and minerals, landforms, erosion. Geologic materials and engineering application of geology. (Prerequisite: Geology, science, or engineering majors, or permission of instructor.)

Geos. 262 3 Credits Fall
Mineralogy and Petrology for Engineers (2+3)
Principles and practice of classification and description of rock, ore and soil forming minerals 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, Geos. 101 or equivalent.)

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: 1988-89.)

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. Materials fee: $10.00. (Prerequisite: Geos. 101.)

Geos. 314 4 Credits Spring
Structural Geology (3+3) n
Origin and interpretation of primary and secondary geologic structures. Graphical solution of structural problems. Laboratory Fee: $10.00. (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. Laboratory Fee: $15.00. (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. Laboratory Fee: $10.00. (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 Geos./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. 408 2 Credits Spring
Photogeology (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. Laboratory fee: $10.00 (Prerequisite: Geos. 304 or permission of instructor.)

Geos. 410 2 Credits Fall
Potential Methods in Geophysics (1+3) 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.)

Geos. 411 3 Credits Spring
Seismic Exploration (2+3) 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.)

Geos. 412 2 Credits Fall
Electrical Methods in Geophysics (1+3) 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.)

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: 1988-89.)

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.)

7 Geos 419 - Continuum Mechanics

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.)

7 Geos 420 - Elements of Seismology

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. 432 3 Credits Fall
Geology of Mineral Resources (3+0) 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. (Prerequisites: Geos. 214, Geos. 314, Geos. 322, Geos. 401)

Geos. 432L 2 Credits Fall
Geology of Mineral Resources Laboratory (1+3) n
Laboratory work includes identification, characterization and systematic description of major ore types. Laboratory fee: $10.00. (Prerequisites: Geos. 214)

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: 1987-88.)

Geos. 465 3 Credits Alternate Spring
Geoarcheology (3+0)
(Same as Anth. 465)
The geological context of archeological sites and the geologic factors that affect their preservation, with emphasis on Alaska. Includes a one or two-day field trip planned for a weekend in late April or early May. (Prerequisites: Geos. 101, an introductory course in archeology, or permission of instructor. Next offered: 1987-88.)

Geos. 470 4 Credits Alternate Fall
Petroleum Geology (3+3)
The study of the basic elements required for hydrocarbon accumulation: source, maturation, migration, reservoir, seal, and trap. These elements, and exploration and production practices will be illustrated using examples of oil and gas fields throughout the world. The lab will provide practical experience with the tools and techniques of surface and subsurface exploration. (Prerequisites: Geos. 314, Geos. 321, Geos. 322. Next offered: 1988-89.)

Geos. 482 1 Credit Fall and 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. 603 1-2 Credits As Demand Warrants
Advanced Field Mapping (0+3)-(1+3)
Practical experience in advanced field mapping techniques with accompanying instruction in the regional and local geology of the study area. (Prerequisite: Geos. 351.)

Geos. 605 3 Credits Spring
Geochronology (3+0)
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: Graduate standing or permission of the instructor.)

Geos. 606 2 Credits Spring
Volcanology (2+0)
Physical processes of volcanism. Specific topics to be discussed include global tectonic setting, physical properties of magmas, eruption mechanisms, volcanic hazards, volcano geophysics. Special emphasis will be on explosive volcanism and its products, the pyroclastic rocks. Geochemistry and petrology will not be emphasized in this course. (Prerequisite: permission of instructor.)

Geos. 607 2 Credits Spring
Advanced Paleomagnetism (1+3)
An advanced course in the theory and practice of paleomagnetism including the basic magnetic properties of rocks, paleomagnetic techniques, and interpretation of paleomagnetic data. (Prerequisites: Senior or graduate standing.)

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
Advanced Seismology (3 + 0)
Characteristics of seismic sources; general properties of seismic wave forms; near field and far field of seismic radiation; characteristics of seismic wave propagation media; free oscillations of the earth. (Prerequisites: Math. 421, Phys. 312, elementary course in basic seismology or permission of instructor. Next offered: 1987-88.)

Geos. 611 3 Credits Alternate Fall
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. Next offered: 1987-88.)

Geos. 612 3 Credits Fall
Geologic Evolution of Alaska (3 + 0)
An overview of the geologic provinces of Alaska and neighboring continental and oceanic regions. Emphasis will be on the geologic history and tectonic evolution of Alaska. (Prerequisites: Geos. 214, 314, 321, and 322, or equivalents.)

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: 1987-88.)

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: 1988-89.)

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: 1987-88.)

Geos. 618 2 Credits Spring
Topics in Alaskan Geology (2 + 0)
Advanced study addressing specific regions or topical problems in Alaskan geology. Subject matter will vary from semester to semester. Seminar format. (Prerequisite: Permission of instructor.)

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. Laboratory fee: $15.00. (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; (B) advanced structural geology; (C) geotectonics. Laboratory fee: $10.00. (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 MSL. 660, or permission of instructor. Next offered: 1988-89.)

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, E. modern fossil fuel exploration, and F. detailed study of particular ore deposit type. Only one topic will be presented at a time. (Prerequisite: Permission of instructor.)

Geos. 640 4 Credits Alternate Spring
Petrology of Carbonate Rocks (3 + 3)
Origin, depositional environments, diagenesis and classification of limestones, dolostones and related rocks. (Prerequisites: Geos. 321 and 322. Next offered: 1988-89.)

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 Alternate Fall
Sandstone Depositional Environments (3 + 0)
An advanced course stratigraphy treating the hydrodynamics, sediment dispersal patterns, and preservation potential of modern terrigenous clastic depositional environments and criteria for recognizing their ancient counterparts in the geologic record. (Prerequisites: Geos. 321, Geos. 322. Next offered: 1987-88.)

Geos. 644 3 Credits Spring
Advanced Stratigraphy (3 + 0)
An advanced course covering concepts of stratigraphic classification and stratigraphic units, physical stratigraphy, biostratigraphy, and chronostratigraphy. Emphasis on theory and on discerning geologic time from stratified rocks. (Prerequisites: Undergraduate stratigraphy and graduate standing or permission of instructor.)

Geos. 645 3 Credits Alternate Fall
Advanced Carbonate Sedimentology (3 + 0 or 2 + 3)
An advanced course providing detailed treatment of various topics in carbonate sedimentology. Specific topics to be considered in different semesters include: A. carbonate petroleum reservoirs, B. evolution of carbonate platforms, C. deep-water carbonates, and D. dolomitization and diagenesis. (Prerequisite: Course in carbonate sedimentology or permission of instructor. Next offered: 1987-88.)

Geos. 646 3 Credits Alternate Spring
Seismic Stratigraphy (2 + 3)
A practical course treating the stratigraphic analysis of reflection seismic data as applied to regional basin analysis and petroleum exploration. Lectures describe the geologic basis for interpreting reflection profiles, the nature of acoustic velocity impedance contrasts along geologic horizons, the record and effect of sea-level variation and the global correlation of seismic sequences. Laboratory exercises are designed to provide "hands on" experience in reconstructing basin architecture using seismic sections from Alaska's North Slope and other basins from around the world. (Prerequisites: Geos. 411 or permission of instructor. Geos. 643 recommended. Next offered: 1988-89.)

Geos. 647 3 Credits Alternate Fall
Advanced Sedimentology (3+0)
An advanced treatment of basic principles of sediment transport, deposition, bedform evolution, and the development and preservation of primary sedimentary structures. Emphasis on character, physical basis, and recognition of sedimentary structures and textures. (Prerequisites: Graduate standing and permission of instructor. Laboratory fee: $10.00. Next offered: 1988-89.)

Geos. 648 3 Credits Alternate Fall
Sedimentary Basin Analysis (3+0 or 2+3)
Application of stratigraphic, sedimentologic, geophysical, and tectonic principles to the analysis of sedimentary basins and their evolution. The course begins with a review of pertinent methods of analysis and then focuses on their appliction to specific sedimentary basins. (Prerequisites: Geos. 321, Geos. 322, or equivalent. Next offered: 1988-89.)

Geos. 649 3 Credits Alternate Spring
Geomorphology of the Unglaciated Arctic and Subarctic (3+0)
A study of the processes that shape northern landscapes and of the distinctive morphology that they produce. Application to environmental planning, soils engineering, ecology and paleo-ecology, Quaternary history, and economic geology. (Prerequisites: Geos. 101 and 304 desirable, but not required. Next offered: 1987-88.)

German

(For UAF program in Germany, see International Programs.)
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: 1987-88; Ger. 303: 1988-89.)

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: 1987-88.)

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: 1988-89.)

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. 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. 110 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. 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
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: 1987-88.)

Hist. 122 3 Credits Alternate Spring
East Asian Civilization (3+0) s
East Asia from 1800 to the present with emphasis on patterns of social cohesion, transition, and revolutionary change. (Next offered: 1987-88.)

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: 1988-89.)

Hist. 305 3 Credits Alternate Fall
Europe: 1789-1850 (3+0) s
The French Revolution, Napoleon, the Industrial Revolution, the Revolutions of 1848, their impact on political, economic, social and intellectual history. (Prerequisite: Hist. 102 or permission of instructor. Next offered: 1987-88.)

Hist. 306 3 Credits Alternate Spring
Europe: 1850-1900 (3+0) s
The European Imperium—industrialization, nationalism, imperialism and their impact on political, economic, social and intellectual history. (Prerequisite: Hist. 102 or permission of instructor. Next offered: 1987-88.)

Hist. 315 3 Credits Alternate Fall
Europe: 1900-1945 (3+0) s
Europe through two world wars, the Russian Revolutions, the depression, the development of fascism, the evolution of Russian Communism. (Prerequisites: Hist. 101, 102 or permission of instructor. Next offered: 1988-89.)

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: 1988-89.)

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: 1987-88.)

Hist. 330 3 Credits Alternate Fall
Modern China (3+0) s
From 1800 to the present: 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: 1987-88.)

Hist. 331 3 Credits Alternate Spring
Modern Japan (3+0) s
From 1600 to the present: 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: 1987-88.)

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: 1989-90.)

Hist. 350 3 Credits Alternate Spring
History of the People's Republic of China (3+0) s
Political, economic, and social developments, from 1949 to the present. (Prerequisite: Hist. 121 or 122, or permission of instructor. Next offered: 1988-89.)

Hist. 354 3 Credits Alternate Fall
Canadian History to 1867 (3+0) s
The political, social, and economic development of Canada from the founding of New France to Confederation. (Next offered: 1988-89.)

Hist. 355 3 Credits Alternate Spring
Canadian History: 1867 to Present (3+0) s
The political, social, and economical development of Canada from Confederation to the present. (Next offered: 1988-89.)

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: 1987-88.)

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: 1987-88.)

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: 1989-90.)

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: 1989-90.)

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: 1987-88.)

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: 1988-89.)

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: 1988-89.)

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: 1987-88.)

Hist. 450 3 Credits Alternate Spring
Twentieth Century America (3+0) s
United States from the progressive movement to the present day, with emphasis on domestic developments. (Prerequisites: Hist. 131, 132 or permission of instructor. Next offered: 1987-88.)

Hist. 455 3 Credits Alternate Fall
Military History (3+0) s
Warfare from classical times to the present: the interrelationships of warfare and society, the role of technology and the development of tactics and strategy. (Prerequisites: Junior standing or permission of instructor. Next offered: 1989-90.)

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. 475-476 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: 1988-89.)

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: Soc. 101 or Psy. 101).

HMSV 205 3 Credits Fall
Factors in Health and Disease (3+0)
Introduction to the phenomenon of human disease. Cases will be presented to demonstrate the way the normal healthy state may be disrupted by external or internal influences. The natural histories of major types of disease will be reviewed.

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. Next offered: 1988-89.)

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)
(Same as Psy. 355)
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)
(Same as Psy. 356)
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 or Psy. 355.)

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.)

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 3-6 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. 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: 1988-89.)

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: 1988-89.)

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: 1987-88.)

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: 1987-88.)

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 1988-89.)

Japanese

(For UAF program in Japan, see International Programs.)
Jpn. 101 5 Credits Fall
Jpn. 102 5 Credits Spring
Elementary Japanese I and II (5+0) h
Introduction to spoken and written Japanese. The student will acquire a vocabulary of approximately 1,000 words and will learn to read and write the two syllabaries, hiragana and katakana, as well as 150 kanji. The cultural dimension will be explored implicitly through language and explicitly through audiovisual materials. Courses are taught in Japanese.

Jpn. 201 4 Credits Fall
Jpn. 202 4 Credits Spring
Intermediate Japanese I and II (4+0) h
The student will learn to read and write an additional 250 kanji. Conversational ability and listening comprehension will be enhanced through the use of videotape materials. Courses are taught in Japanese. (Prerequisite: Jpn. 102 or equivalent.)

Jpn. 301 3 Credits Fall
Jpn. 302 3 Credits Spring
Advanced Japanese (3+0)
These courses serve to develop advanced conversational and reading skills. Topics may include; modern Japanese prose fiction; newspaper Japanese; advanced conversation through the study of common contractions and idiomatic usage in the standard Tokyo dialect; and a study of television drama series. May be repeated with different topics. (Prerequisites: Jpn. 202 or equivalent.)

Jpn. 332 3 Credits Alternate Spring
Japanese Cultural Traditions (3+0)
A study of Japanese cultural traditions as revealed in the literary, visual, and performing arts. Discussion of literature in English translation will be integrated with slide-lectures on Buddhist painting and sculpture, picture scrolls, castle decoration, woodblock prints, the tea ceremony, gardens, and the No, Kabuki, and puppet theatres. Course is taught in English. (Prerequisites: Junior standing or consent of instructor. Next offered: 1987-88.)

Jpn. 333 3 Credits Alternate Fall
Twentieth Century Japanese Prose Fiction (3+0)
A study of selected novels, short stories, and film scripts in translation representative of styles and themes which characterize twentieth century Japanese literature. Class discussion will invite a close analysis of each work in terms of characterization, themes, structure, style, and as an expression of social problems or intellectual issues in modern Japanese society. Course is taught in English. (Prerequisites: Junior standing or consent of instructor. Next offered: 1988-89.)

Journalism — Broadcasting

J-B 101 3 Credits Fall and Spring
Introduction to Mass Communications (3+0) h
History and principles of mass communications and the role of information media in American society. Introduction to professional aspects of mass communications, including print and broadcast.

J-B 102 3 Credits Fall
Broadcasting and Society (3+0) h
Principles of broadcasting as they relate to the people of the United States, including history, government involvement, and social effects.

J-B 203 3 Credits Fall and Spring
Basic Photography (2+3) h
Photography fundamentals, including use of an adjustable camera, film and exposure techniques, filters, flash techniques, and an introduction to color. Black and white darkroom procedures including film processing and printing. Design and composition as they apply 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) h
Photographic communications including use of an adjustable camera, film developing and printmaking, flash and design elements applied to visual communications. Students will make candid photos of people involved in news events and learn how to document news visually. 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)
Sound production for radio, television, film, and stage amplifications. Emphasis on writing, recording, control room techniques, and editing. Laboratory fee: $10.00.

J-B 240 3 Credits Spring
International Communications (3+0) h
Historical development of different mass communication systems around the globe. The relationship between press philosophies and their practical implementation. Mass communication systems of selected countries as representative examples of generalized systems.

J-B 301 4 Credits Fall and Spring
Basic Newsgathering and Processing (2+4) h
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 instructor.)

J-B 303 3 Credits Fall and Spring
Intermediate Photography (2+3) h
Continuation of J-B 203 and J-B 204 with emphasis on the picture story and freelance photography. Laboratory fee: $30.00. (Prerequisite: J-B 203, J-B 204 or permission of instructor.)

J-B 311 3 Credits Fall and Spring
Magazine Article Writing (2+1) h
Writing articles for publication. Students repeating the course limited to six credits. (Prerequisites: J-B 301 or permission of instructor.)

J-B 316 3 Credits Fall ~~Spring~~
Television Productions (2+4)
Television production, floor directing, audio, camera, film chain, staging, lighting, and switching. (Prerequisites: J-B 215 or permission of instructor.)

J-B 317 3 Credits Spring ~~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 included. (Prerequisite: J-B 301, or permission of instructor.)

J-B 320 3 Credits Spring
Journalism in Perspective (3+0) h
Present problems and trends in mass communication with emphasis on historical development, including survey of world press coverage and problems. (Prerequisite: Junior standing.)

J-B 323 3 Credits Fall
Magazine Editing (3+0)
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)
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)
Advertising: including strategy, media use, creation and production of advertisements and measurement of advertising effectiveness. (Prerequisite: Junior standing.)

J-B 340 3 Credits Fall
Approaches to the Study of Mass Communication (3+0) s
Development of mass communication theory and research in the U.S. in the twentieth century. Relationship between theoretical assumptions and concerns of investigators, questions posed, methodological frameworks adopted, findings reached, and integration of new knowledge into the existing corpus.

J-B 372 3 Credits Alternate Fall
Methods of Instructional Broadcasting (3+0)
Studio practices and procedures for producing instructional programs. Underlying educational philosophy and actual in-studio practice. (Prerequisite: J-B 215 or permission of instructor. Next offered: 1987-88.)

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) h
Special techniques in publications photography. Student concentrates on one or more 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)
Programming practices at radio and TV stations, networks, cable companies and relationship of the 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) h
Writing advanced articles for publication. 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) s
Common law, statutory law and administrative law that affects the mass media, including libel, copyright, access to the media, constitutional problems, privacy, shield laws, and broadcast regulations. (Prerequisite: J-B 301, or permission of instructor.)

J-B 415 3 Credits Fall
News/Documentary Television Production (2+2)
Electronic news gathering, electronic field production using remote videotape equipment. Develop skills in scriptwriting, budgets, location sound recording, interview techniques, editing, videography, and other aspects of field production. (Prerequisites: J-B 204 and J-B 215.)

J-B 416 3 Credits Alternate Fall
Advanced Broadcast Production (1+6)
Advanced broadcast production in either TV or radio. Each student produces, directs, and writes productions 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: 1987-88.)

J-B 420 3 Credits Spring
Book Writing (3+0)
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)
Magazine publication experience, including writing, photography, editing, design, layout, advertising, and circulation. Students edit and produce *Alaska Today* magazine, under journalism faculty supervision. (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
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) h
Advanced reporting, writing and editing of news with emphasis on public affairs. Develops 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 instructor.)

Justice

Just. 110 3 Credits Fall and Spring
Introduction to Justice (3+0) s
Survey of the structure and process of the agencies of criminal justice. Includes introduction to criminology, criminal law, and the juvenile justice system.

Just. 221 3 Credits Spring
Justice Organization and Management (3+0)
Survey of organizational structure and management styles of criminal justice agencies. Includes application and critique of major theoretical models.

Just. 250 3 Credits Fall
History of the Law (3+0) s
(Same as P.S. 250)
An introduction to the history of the law in Western civilization with an emphasis on the development of Anglo-American law in America.

Just. 251 3 Credits Spring
Criminology (3+0) s
The study of the major areas of deviant behavior and its relationships 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
Survey of the structure and process of the juvenile justice system and the major theories of juvenile delinquency. (Next offered: 1988-89.)

Just. 259 3 Credits Alternate Spring
Introduction to Public Administration (3+0) s
(Same as P.S. 212)
Theories and practices of public administration, especially as applied to federal agencies. Study of organization planning, and decision making in implementing public policy. (Next offered: 1988-89.)

Just. 303 3 Credits Fall
Introduction to Legal Processes (3+0)
(Same as P.S. 303)
The purpose and functions of law in society, with a focus on legal reasoning and decisionmaking in civil cases. (Prerequisites: P.S. 101, Just. 110.)

Just. 310 3 Credits Spring
Principles of Corrections (3+0) s
An introduction to adult institutions, community-based programs, and theories of incarceration. Correctional programs are examined. (Prerequisite: Just. 251 or permission of instructor.)

Just. 320 Variable Credit Fall and 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 Spring
Law and Society (3+0) s
(Same as P.S. 330)
Study of moral issues related to the proper reach, extent, and enforcement of the law. (Prerequisites: P.S. 101 or Just. 110.)

Just. 352 3 Credits Fall
Criminal Law (3+0)
A study of 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. 404 3 Credits Spring
Introduction to Legal Research and Writing (3+0)
(Same as P.S. 404)
The methods of legal research and preparation of legal materials, to the resources of law libraries and the techniques of presenting issues in legal form. (Prerequisites: P.S. 101, Just. 110, Just./P.S. 303.)

Just. 451 3 Credits Fall
Research Methods (3+0)
Application of social science research methods to solving scientific and non-scientific questions arising in Justice. Basic methods include experimentation and survey research.

Just. 452 3 Credits Spring
Comparative Criminal Justice (3+0) s
Study of police, courts, and corrections in selected countries throughout the world. Includes Soviet Union, Japan, France and others. (Prerequisites: Just. 110, senior standing or permission of instructor.)

Just. 460 3 Credits Fall
Justice Processes (3+0) s
Major concepts of the structure and process of criminal justice revisited with emphasis on current issues. (Prerequisite: Just. 110, Just. 251, or senior standing.)

Just. 475 3 Credits Fall and Spring
Internship
On site experience in criminal justice agencies. (Prerequisite: Permission of director of intern program.)

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) chg discription
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.)
L.S. 307 - Information Resources
L.S. 309 - Info for Educators

Linguistics

Ling. 101 3 Credits Fall
Nature of Language (3+0) h
The study of language: systematic analysis of human language and description of its grammatical structure, distribution, and diversity.

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: 1987-88.)

Ling. 303 3 Credits As Demand Warrants
Language and Literacy Development (3+0)
(Same as Ed. 303)
Principles, procedures, and materials for enhancing the language development of young children. (Prerequisite: Psy 240.)

Ling. 318 3 Credits Alternate Spring Fall
Introduction to Phonetics and Phonology (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: 1987-88.)

Ling. 320 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: ~~1988-89~~ 1988 ~~1989~~.)

Ling. 350 3 Credits — Alternate Fall
Historical Linguistics (3 + 0)
Introduction to comparative and historical linguistics: methods of linguistic reconstruction, historical change, genetic relationships, dialectology. Includes Indo-European and Alaskan languages. (Prerequisite: Ling. 318. Next offered: 1988-89.)

Ling. 410 3 Credits — Alternate Fall
Theory and Methods of Second Language Teaching (3 + 0)
Theory and practice of teaching a second language, including methodological approaches, second language acquisition theory, materials, and testing. (Next offered: 1987-88.)

Ling. 450 3 Credits — Every Third Spring
Language Policy and Planning (3 + 0)
Consideration of minority languages, including Alaskan Native Languages, in light of their histories, current status, and factors affecting future maintenance. (Next offered: 1988-89.)

Ling. 482 3 Credits — Every Third Year
Seminar in Linguistics (3 + 0)
Current issues in various subfields of linguistics including semantics and pragmatics, discourse analysis, bilingualism, lexicography, language philosophy, and issues within a particular language or language group, e.g. Eskimo phonology, Athabaskan morphology. May be repeated once. (Next offered: 1988-89.)

Marine Science and Limnology

MSL 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.

MSL 411 3 Credits — Alternate Fall
Current Topics in Oceanographic Research (3 + 0)
Study of current oceanographic research problems from biology, chemistry, geology, and physics. Topics will include sea floor hydrothermal vents and their indigenous communities, manganese nodules, tsunami prediction, radioisotopes in the sea, Bering Sea productivity, and the role of the ocean in global warming due to fossil fuel carbon dioxide. (Prerequisites: Four semesters of natural sciences at 100 level or above or permission of the instructor. Next offered: 1987-88.)

MSL 435 3 Credits — Alternate Fall
Acoustical Oceanography (3 + 0)
Principles and applications of underwater sound in solving oceanographic problems related to chemistry, physics, geology and biology, including hydroacoustical methods, acoustical phenomena, bioacoustics and fisheries acoustics, environmental noise and signal processing. (Prerequisites: college physics and calculus. Next offered: 1987-88.)

MSL 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: 1988-89.)

MSL 611 5 Credits — Alternate Summer
Field Problems in Marine Biology (0 + Arr)
Study of pelagic and benthic ecosystems emphasizing distribution, abundance and ecology of dominant species. Students will also complete a research project of their choosing. Five-week course offered at the Seward Marine Center. (Prerequisites: Graduate standing or permission of the instructor; invertebrate zoology or equivalent. Next offered: Summer 1988.)

MSL 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. Next offered: 1987-88.)

MSL 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.)

MSL 621 3 Credits — Alternate Fall
Polar Marine Science (3 + 0)
Physical, biological, chemical and geological oceanography of the Polar oceans with emphasis on comparing and contrasting the Arctic and Antarctic. (Prerequisites: MSL 620, 630, 650, 660, or concurrent registration, or permission of instructor. Next offered: 1987-88.)

MSL 622 3 Credits — Alternate Fall
Satellite Oceanography (3 + 0)
A broad introduction to satellite oceanography from first principles to techniques for applying satellite data to oceanography. (Prerequisite: Upper division or graduate study in a science or consent of instructor. Next offered: 1987-88.)

MSL 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.)

MSL 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. Next offered: 1987-88.)

MSL 630 3 Credits — Spring
Geological Oceanography (3 + 0)
Topography and structure of the ocean floor. Ocean basins, continental slope, shelf and coastal environments. Major sediment types and distributions. Hydrodynamics and sediment transport and deposition, including actions of waves, currents, and submarine gravity flows. (Prerequisite: Introductory college geology or permission of instructor.)

MSL 640 3 Credits — Alternate Spring
Fisheries Oceanography (3 + 0)
Oceanographic processes supporting marine fish and shellfish populations. Natural mortality, and recruitment. Prey-predator relationships during early life history. Migration and swimming behaviors related to fishing. Fishing grounds in oceanic front and upwelling regions, and on shelf and banks. Prediction of fishing ground, fishing season and abundance using physical, chemical, biological and geological oceanic variables. (Prerequisite: MSL 650 or permission of instructor. Next offered: 1988-89.)

MSL 650 3 Credits — Fall
Biological Oceanography (3 + 0)
Biological processes including organic matter synthesis and transfer. Primary and secondary productivity in the plankton and benthos. Nutrients and nutrient cycling. Emphasis on principles and concepts applied to understanding the biological form and function of specific oceanic provinces. (Prerequisites: Introductory college biology and chemistry.)

MSL 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.)

MSL 661 2 Credits Alternate Spring
Isotope Techniques for Aquatic Sciences (2+0)
An examination of the use of added or naturally occurring isotope tracers in ecological studies. Demonstration of equipment and modern techniques. (Prerequisite: MSL 660 or permission of instructor. Next offered: 1987-88.)

MSL 662 3 Credits Alternate Spring
Fjord Oceanography (3+0)
A comprehensive, interdisciplinary treatment of fjords and fjord environments within the context of estuarine oceanography. Emphasis on Alaskan examples. (Prerequisite: Graduate standing or permission of instructor. Next offered: 1987-88.)

MSL 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. Next offered: 1987-88.)

MSL 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: MSL 660 and 650 or permission of instructor. Next offered: 1987-88.)

MSL 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: 1987-88.)

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. 107 3 Credits Fall and Spring
Elementary Functions (3+0) m
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) m
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) m
Rectangular coordinate system, the straight line, conic sections, transcendental curves, polar coordinates, parametric equations, and solid analytic geometry. (Prerequisite: Two years of high school algebra.)

Math. 110 3 Credits Fall and Spring
Mathematics of Finance (3+0) m
Simple and compound interest, discount, annuities, amortization, sinking funds, depreciation, and capitalization. (Prerequisite: Two years high school mathematics, including at least one year of algebra.)

Math. 131 3 Credits Fall

Math. 132 3 Credits Spring
Concepts of Mathematics 3(3+0) m
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. Note: These courses do not provide technical preparation for, nor are they prerequisites for, any other college level mathematics courses. (Prerequisite for Math 131 - Two years high school mathematics, including at least one year of algebra; for Math 132: Math 131 or consent of instructor.)

Math. 161 3 Credits Fall and Spring
Algebra for Business and Economics (3+0) m
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) m
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) m
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) m
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) m
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) m
Elementary set theory, numeration systems, and algorithms of arithmetic, divisors, multiples, integers, introduction to rational numbers. (Prerequisites: two years high school mathematics, including at least one year of algebra.)

Math. 206 3 Credits Spring
Mathematics for Elementary School Teachers II (3+1) m
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) m
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) m
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) m
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) m
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. 306 3 Credits **Alternate Spring**
Introduction to the History and Philosophy of Mathematics (3 + 0)
A concise survey of the history and philosophy of mathematics for students of mathematics, science, history and philosophy as well as a detailed study of certain important periods of that history as examined by such thinkers as Plato, B. Russell, D. Hilbert, L.E.J. Brouwer and K. Godel. (Prerequisites: Math. 202 or permission of instructor. Next offered: 1987-88.)

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 **Spring**
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 **Fall**
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 **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.)

Math. 604 3 Credits **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.)

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: 1987-88.)

Math. 615 3 Credits **Fall**
Applied Numerical Analysis (3 + 0)
Review of numerical differentiation and integration, and the numerical solution of ordinary differential equations. Main topics to include the numerical solution of partial differential equations; curve fitting, splines, and the approximation of functions. Supplementary topics such as the numerical method of lines, the fast Fourier transform, and finite elements may be included as time permits and interest warrants. (Prerequisites: C.S. 201, Math. 310, Math. 314, Math. 421, Math. 422 or consent of the instructor.)

Math. 621 3 Credits **Alternate Fall**
Advanced Applied Analysis (3 + 0)
Topics covered may include conformal mapping, Fourier, Laplace, and Z transforms and impulse functions with applications to solving differential equations which arise in science and engineering. Other topics as time permits include asymptotic expansions, local analysis of O.D.E.'s and special functions. (Prerequisites: Math. 421-422 or Math. 604 or permission of instructor. Next offered: 1988-89.)

Math. 622 3 Credits **As Demand Warrants**
Topics in Applied Analysis (3 + 0)
Topics in applied analysis to be determined at the time of registration to fit the needs of the students. (Prerequisites: permission of instructor.)

Math. 630 3 Credits **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.)

Math. 631 3 Credits **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.)

Math. 651 3 Credits **Every third year**
Topology (3 + 0)
Treatment of the fundamental concepts of topology. Topologies on a set, connectedness, compactness, paracompactness, metrization problems, maps, convergence via nets and filters, homotopy, fundamental groups and covering spaces, homology theory, degree theory. (Prerequisites: Math. 401-402 or Math. 404 or permission of instructor. Next offered: Spring 1990.)

Math. 660 3 Credits **Alternate Spring**
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 instructor. Next offered: Spring 1988-89.)

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 **Alternate Spring**
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 instructor. Next offered: Spring 1988.)

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. 210.)

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. Laboratory fee: $25.00.

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. Laboratory fee: $15.00. (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. Laboratory fee: $15.00. (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 Enginering (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: 1987-88.)

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: 1987-88.)

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: 1987-88.)

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: 1987-88.)

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: 1987-88.)

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: 1988-89.)

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: 1987-88.)

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 1987-88.)

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.

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: 1987-88.)

M.Pr. 313 3 Credits **Alternate 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. Next offered: 1987-88.)

M.Pr. 314 3 Credits **Alternate Spring**
Unit Preparation Processes (1+6)
Liberation and concentration by gravity, electro-magnetic, and electrostatic methods. Economic analysis and flowsheets for different ores are developed. (Prerequisite: M.Pr. 313. Next offered: 1988-89.)

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: 1988-89.)

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: 1987-88.)

M.Pr. 601 3 Credits **Spring**
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. (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 2 Credits **Fall**
Introduction to Mining Engineering (2+0)
Concepts and methods utilized in mining engineering. Practical training in safety and mining unit operations.

Min. 104 1 Credit **Fall**
Mining Safety and Operations Laboratory (0+3)
Practical training at the Silver Fox Mine in mining operations and safety. Course complies with Mine Safety and Health Administration (MSHA) 40 Hour New Miner Training.

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 planning, design and engineering control, mine ventilation network. (Prerequisite: Min. 103.)

Min. 370 3 Credits **Spring**
Rock Mechanics (2+3)
Strength and deformation characteristics of rock, stress distribution in the vicinity of mining openings, design criteria and support for structures in rock mass, instrumentation and monitoring of opening's stability as well as strata control and surface subsidence. (Prerequisites: E.S. 331 and A.S. 451 or equivalent.)

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 **Alternate Spring**
Mineral Industry and the Environment (2+0)
Principles and practices of mining reclamation and waste disposal. Impact of regulations on the mineral industry and the environment. (Prerequisite: Permission of instructor. Next offered: 1988-89.)

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)
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 mining law. Access to property, safety and environmental laws (and court decisions) as they pertain to mining. (Prerequisite: Senior standing or permission of instructor. Next offered: 1988-89.)

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 and other methods are covered. (Prerequisite: Min. 370.)

Min. 445 3 Credits **Fall**
Design of Surface Mines for Conventional and Arctic Conditions (3+0)
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)
Design of placer and offshore mining methods. Occurrence properties and mineral content of placer and offshore deposits. Underground mining of frozen placer deposits. (Prerequisites: Min. 301, senior standing or permission of the instructor.)

Min. 472 3 Credits **Alternate Spring**
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. Next offered: 1987-88.)

Min. 490 2 Credits **Spring**
Mining Design Project (1+3)
Design of mine layout including extraction and beneficiation 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 **Fall**
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.)

Min. 631 4 Credits Alternate Fall
Research Methods in Mineral Engineering (3+3)
Research problem definitions, design of experiment, collection and processing of data. Review of theoretical and experimental research methods with examples. (Prerequisites: Math. 302 or equivalent, Min. 370 or C.E. 435 or permission of instructor. Next offered: 1988-89.)

Min. 635 3 Credits Spring
Geostatistical Ore Reserve Estimation (2+3)
(Same as G.E. 635)
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.)

Min. 637 3 Credits Alternate Fall
Mine Systems Simulation (2+3)
Application of computer simulation to the analysis of static and dynamic mine systems. Design of simulation experiments in mining engineering. (Prerequisites: Min. 409; or ESM 621 and a course in computer programming; or equivalent. Next offered: 1988-89.)

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: 1987-88.)

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: 1987-88.)

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, boundary conditions for mine ventilation systems, computer-aided solution techniques. (Prerequisites: Min. 302 or equivalent, a course in computer science and a course in differential equations. Next offered: 1988-89.)

Min. 673 3 Credits Alternate Fall
Theoretical and Experimental Methods in Rock Mechanics (2+3)
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 and experimental techniques and failure criteria. (Prerequisite: Min. 370 or equivalent. Next offered: 1988-89.)

Min. 674 3 Credits Alternate Spring
Selected Topics in Rock Mechanics (2+3)
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, solution mining, and those exposed to rock outbursts and earthquakes. (Prerequisites: Min. 370 or equivalent, Min. 673 or equivalent, or permission of instructor. Next offered 1988-89.)

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: see below. (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: see below. (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 1-2 Credits As Demand Warrants
Advanced Chamber Music (0+3)-(1+3)
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, organ, voice, orchestral and band 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: see below. (Prerequisite: Admission by audition. Course may not be audited. Credit-No Credit grading not permitted.)

Mus. 190 0 Credit Fall and Spring
Recital Attendance (1+0)
Recital and concert attendance.

Mus. 390 0 Credit Fall and Spring
Junior Recital
Half-length solo music performance recital. (Prerequisites: Mus. 262 or equivalent, junior standing in music study, permission of instructor.)

Mus. 490 0 Credit **Fall and Spring**
Senior Recital
Full length music solo recital. (Prerequisites: Mus. 362 or equivalent, senior standing in music study, Mus. 390 or equivalent, permission of instructor.)

Mus. 661 2 or 4 Credits **Fall and Spring**
Advanced Private Lessons
Private instruction in piano, organ, voice, or orchestral and band instrument consisting of one private lesson and one master class per week. Repeatable for credit. Private lesson fee: see below. (Prerequisites: Mus. 462 or equivalent and by audition. Credit-No Credit grading not permitted.)

CLASS LESSONS AND APPLIED MUSIC FEES

Mus. 151 - Class Lessons - Lesson fees for non-music majors and music majors enrolled in 11 or fewer credits: $70.00

Lesson fees for music majors enrolled in 12 or more credits: $35.00

Mus. 153 - Functional Piano - Lesson fees for non-music majors and music majors enrolled in 11 or fewer credits: $70.00

Lesson fees for music majors enrolled in 12 or more credits: $35.00

Mus. 161-462, 661 - Private Lessons - Lesson fees for non-music majors and music majors enrolled in 11 or fewer credits: $145.00

Lesson fees for music majors enrolled in 12 or more credits: $75.00

For music majors, any combination of the above fees shall not exceed a maximum charge of $105.00

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. (Prerequisites: Concurrent enrollment in Mus. 133 for 131 and 134 for 132 required unless exempted by music theory placement test.)

Mus. 133 2 Credits **Fall**
Mus. 134 2 Credits **Spring**
Basic Ear Training (2 + 0) h
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
Eskimo and Indian dance and song styles in Alaska. Emphasis on the sound, effect, and purpose unique to each and the collection methods, analysis, and the development of a broad musical perspective.

Mus. 231 3 Credits **Fall**
Mus. 232 3 Credits **Spring**
Advanced Theory (2 + 3) h
Continued study 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: Concurrent enrollment in Mus. 233 for 231 or 234 for 232 unless exempted by music theory placement test.)

Mus. 233 1 Credit **Fall**
Mus. 234 1 Credit **Spring**
Advanced Ear Training (0 + 3)
Continued training in sight singing and melodic dictation skills begun in Mus. 133 and 134. Harmonic dictation and error detection skills also included. (Prerequisites: Concurrent enrollment in Mus. 231 for 233 or 232 for 234 required unless exempted by music theory placement test.)

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. 330.)

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
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: 1987-88.)

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
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: 1988-89.)

Mus. 422 3 Credits **Alternate Spring**
Music in the Seventeenth and Eighteenth Centuries (3 + 0) h
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: 1988-89.)

Mus. 423 3 Credits **Alternate Fall**
Music of the Nineteenth Century (3 + 0) h
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: 1987-88.)

Mus. 424 3 Credits Fall
Music in the Twentieth Century (3+0) h
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.)

Mus. 431 3 Credits Alternate Spring
Counterpoint (3+0) h
Contrapuntal techniques by means of analysis and synthesis of pieces in contrapuntal idioms. (Next offered: 1988-89.)

Mus. 432 3 Credits Alternate Fall
Orchestration and Arranging (3+0) h
Instrumentation and arranging for vocal and instrumental ensembles. (Next offered: 1987-88.)

Mus. 433 2-3 Credits Alternate Fall
Seminar in Musical Composition (2+0, 3+0) h
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: 1988-89.)

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: 1988-89.)

Mus. 601 3 Credits Fall
Introduction to Graduate Study (3+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)
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: 1987-88.)

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: 1987-88.)

Mus. 651 2-3 Credits As Demand Warrants
Advanced Conducting and Rehearsal Techniques (2-3+0)
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)
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.)

Mus. 690 0 Credit Fall and Spring
Graduate Recital
Full length solo performance recital. (Prerequisites: Mus. 490 or equivalent, graduate standing in applied music study, permission of instructor.)

Petroleum Engineering

Pet.E. 103 2 Credits Fall
Survey of the Energy Industries (2+0)
Overview of global energy supply and demand, alternate energy options, and petroleum production technology.

Pet.E. 205 3 Credits Fall
Introduction to Petroleum Drilling and Productions (3+0)
Fundamental principles of drilling, well completions, production engineering; field trips to Alaskan oil fields if 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 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 Fall
Petroleum Production Engineering (3+3)
Well completion, workovers, surface and subsurface equipment 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 drilling, drilling fluids, drilling mud, drilling problems, mud logging, drill stem testing, rig types, rig design and selection. Drilling optimization. Well 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.)

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. (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)
Transient flow of fluids through porous media, application of solutions of the diffusivity equation to pressure buildup, drawdown, interference testing and log-log type curve analysis and effect of reservoir heterogeneities on pressure behavior. (Prerequisites: 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. (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, derivation and solution of the diffusivity equation, the real gas pseudo potential, and applications of material 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 structuring of research programs, literature review, methods of experimental design, and technical report writing. (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)
Transient flow of single phase and multiphase fluids through porous media, 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: Fall 1987)

Pet.E. 663 3 Credits Fall
Advanced Reservoir Simulation (3+0)
Mathematical description of the reservoir, history matching, and prediction of reservoir performance, class project application to simulation of an Alaskan reservoir. (Prerequisites: Advanced engineering mathematics elective and Pet.E. 610.)

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: Spring 1988.)

Pet.E. 665 3 Credits Every Third Semester
Advanced Phase Behavior (3+0)
The development and application of phase equilibrium simulators to predict fluid properties for reservoir fluids. (Prerequisite: Pet.E. 321 or permission of instructor. Next offered: Fall 1988.)

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 1988.)

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: 1987-88.)

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: 1987-88.)

Phil. 341 3 Credits Alternate Fall
Epistemology (3+0) h
The nature of knowledge, truth and certainty. (Prerequisite: Phil. 201. Next offered: 1988-89.)

Phil. 342 3 Credits Alternate Spring
Metaphysics (3+0) h
The nature of reality comprising both ontology and cosmology. (Prerequisite: Phil. 201. Next offered: 1988-89.)

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: 1988-89.)

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: 1988-89.)

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: 1987-88.)

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: 1987-88.)

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: 1987-88.)

Physical Education

P.E.R. 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. Laboratory fees for the following courses are: Swimming classes -$4.00; physical conditioning, weightlifting and bodybuilding - $5.00; cross country skiing - $10.00; Marksmanship, rifle marksmanship and bowling - $35.00.

P.E. 205 2 Credits Fall
Introduction to the Human Movement Sciences (2+0)
An overview of the human movement sciences that includes the interrelationship of the biological sciences, sociopsychological, historical and philosophical foundations and the role of the humanities in physical activity, fitness, sport and dance. Clarification of career possibilities is included.

P.E. 208 2 Credits Fall
Advanced Life Saving (1+3)
Knowledge and skills necessary to provide aid and treatment in aquatic emergencies. Instruction in American Red Cross Cardio-Pulmonary Resuscitation, Advanced Lifesaving, Advanced Swimmer, and Basic First Aid. (Prerequisite: Swim Test.) Certification fee: $5.00 covers American Red Cross Advanced Life Saving Certification.

P.E. 211 1 Credit Every third semester*
Fundamentals of Softball (1+3)
Basic skills in softball will be presented, with appropriate consideration for adult and youth groups. Emphasis will be on developing personal performance skills and safety procedures for effective class management. *(7 week session. Next offered: Spring 1988.)

P.E. 212 1 Credit Every third semester*
Fundamentals of Basketball (1+3)
Basic skills in basketball will be presented, with appropriate consideration for adult and youth groups. Emphasis will be on developing personal performance skills and safety procedures for effective class management. *(7 week session. Next offered: Spring 1988.)

P.E. 213 1 Credit Every third semester*
Fundamentals of Ice Sports (1+3)
Basic skills in ice sports will be presented, with appropriate consideration for adult and youth groups. Emphasis will be on developing personal performance skills and safety procedures for effective class management. *(7 week session. Next offered: Fall 1988.)

P.E. 214 1 Credit Every third semester*
Fundamentals of Snow Sports (1+3)
Basic skills in snow sports will be presented, with appropriate consideration for adult and youth groups. Emphasis will be on developing personal performance skills and safety procedures for effective class management. *(7 week session. Next offered: Fall 1987.)

P.E. 215 1 Credit Every third semester*
Fundamentals of Volleyball (1+3)
Basic skills in volleyball will be presented, with appropriate consideration for adult and youth groups. Emphasis will be on developing personal performance skills and safety procedures for effective class management. *(7 week sessions. Next offered: Fall 1987.)

P.E. 216 1 Credit Every third semester*
Fundamentals of Rhythms (1+3)
Basic skills in rhythms will be presented with appropriate consideration for adult and youth groups. Emphasis will be on developing personal performance skills and safety procedures for effective class management. *(7 week session. Next offered: Fall 1987.)

P.E. 217 1 Credit Every third semester*
Fundamentals of Recreational Activities (1+3)
Basic skills in recreational activities will be presented, with appropriate consideration for adult and youth groups. Emphasis will be on developing personal performance skills and safety procedures for effective class management. *(7 week session. Next offered: Spring 1988.)

P.E. 218 1 Credit Every third semester*
Fundamentals of Soccer (1+3)
Basic skills in soccer will be presented, with appropriate consideration for adult and youth groups. Emphasis will be on developing personal performance skills and safety procedures for effective class management. *(7 week session. Next offered: Fall 1988.)

P.E. 219 1 Credit Every third semester*
Fundamentals of Aquatics (1+3)
Basic skills in aquatics will be presented, with appropriate consideration for adult and youth groups. Emphasis will be on developing personal performance skills and safety procedures for effective class management. *(7 week session. Next offered: Fall 1988.)

P.E. 220 1 Credit Every third semester*
Fundamentals of Wrestling (1+3)
Basic skills in wrestling will be presented, with appropriate consideration for adult and youth groups. Emphasis will be on developing personal performance skills and safety procedures for effective class management. *(7 week session. Next offered: Spring 1988.)

P.E. 221 1 Credit Every third semester*
Fundamentals of Gymnastics (1+3)
Basic skills in gymnastics will be presented, with appropriate consideration for adult and youth groups. Emphasis will be on developing personal performance skills and safety procedures for effective class management. *(7 week session. Next offered: Fall 1987.)

P.E. 222 1 Credit Every third semester*
Fundamentals of Track and Field (1+3)
Basic skills in track and field will be presented, with appropriate consideration for adult and youth groups. Emphasis will be on developing personal performance skills and safety procedures for effective class management. *(7 week session. Next offered: Fall 1988.)

P.E. 232 3 Credits Spring
Analysis of Human Movement (3+0)
Qualitative analysis of sport and dance through principles derived from the biological and physical sciences and directed towards understanding and improving human performance.

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: $10.00.

P.E. 300 1 Credit Alternate Fall
Advanced Theory and Techniques for Teaching Gymnastics (1+3)*
Indepth study of advanced skills, strategies, and analysis in gymnastics. *Meets for 7 weeks. (Prerequisite: P.E. 221. Next offered: 1988-89)

P.E. 302 1 Credit Alternate Fall
Advanced Theory and Techniques for Teaching Basketball (1+3)*
Indepth study of advanced skills, strategies, and analysis in basketball. *Meets for 7 weeks. (Prerequisite: P.E. 212 Next offered: 1987-88.)

P.E. 303 1 Credit Alternate Fall
Advanced Theory and Techniques for Teaching Ice Sports (1+3)*
Indepth study of advanced skills, strategies, and analysis in teaching ice sports. *Meets for 7 weeks. (Prerequisite: P.E. 213. Next offered 1987-88.)

P.E. 304 1 Credit Alternate Spring
Advanced Theory and Techniques for Teaching Snow Sports (1+3)*
Indepth study of advanced skills, strategies, and analysis in teaching snow sports. *Meets for 7 weeks. (Prerequisite: P.E. 214. Next offered 1987-88.)

P.E. 305 1 Credit Alternate Fall
Advanced Theory and Techniques for Teaching Volleyball (1+3)*
In-depth study of advanced skills, strategies, and analysis in volleyball. *Meets for 7 weeks. (Prerequisite: P.E. 215. Next offered: 1988-89.)

P.E. 306 1 Credit Alternate Fall
Techniques in Teaching Creative Dance (1+3)*
Skill and practice in organizing creative dance experiences for all age groups. Emphasis is on learning techniques which will free people to create from their own movement vocabularies. Some emphasis on correct body alignment and techniques of moving. *Meets for 7 weeks. (Prerequisite: P.E. 216. Next offered: 1987-88.)

P.E. 307 1 Credit Alternate Spring
Techniques in Camping and Outdoor Recreation (1+3)*
In-depth study of advanced skills and organizational techniques in camping and outdoor recreation. *Meets for 7 weeks. One weekend campout will be required. (Prerequisite: P.E. 217. Next offered: 1988-89.)

P.E. 308 1 Credit Alternate Fall
Techniques in Track and Field (1+3)*
In-depth study of advanced skills and analysis of track and field. *Meets for 7 weeks. (Prerequisite: P.E. 222. Next offered: 1987-88.)

P.E. 309 2 Credits Spring
Aquatic Instructor (1+3)
Knowledge and skills necessary to teach swimming to children and adults, beginner through advanced swimmer and lifesaving. (Prerequisites: current American Red Cross Lifesaving Certificate and swim test.) Certification fee: $5.00. Covers administrative fee for American Red Cross Water Safety Instructor Certificate.

P.E. 310 1 Credit Alternate Spring
Techniques in Teaching Folk and Square Dance (1+3)*
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. *Meets for 7 weeks. (Prerequisite: P.E. 216. Next offered: 1988-89.)

P.E. 316 3 Credits Fall
Motor Development (3+0)
Motor skill and behavior development, infancy through old age. Individual differences, issues, applications and appraisal techniques. (Prerequisites: Psy. 101 and junior standing.)

P.E. 317 3 Credits Spring
Motor Learning (3+0)
Physical skills learning processes, patterns, issues, programs, applications, and evaluation. (Prerequisites: Psy. 101 and junior standing.)

P.E. 321 1 Credit Fall/Spring
Practicum in Physical Education (0+3)
Student will serve as apprentice instructor or leader in university class or with approved supervisor within the community and will assume increasing responsibility for planning and conducting activities under supervision. Class may be repeated. Only 2 credits may count toward department requirement. (Prerequisites: Appropriate 300 level technique courses and 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: 1987-88.)

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: 1988-89.)

P.E. 405 2 Credits Fall
Concepts and Design of Physical Fitness Programs (1½+1½)
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. (Prerequisites: Biol. 111 and 112.)

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. (Prerequisite: Ed. 330. Next offered: 1987-88.)

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. 219 or 309. Next offered: 1988-89.)

P.E. 411 3 Credits Every Third Semester
History and Philosophy of Sport and Physical Activity (3+0)
Examines the role of sport and physical activity from the perspective of the major philosophies. The contributions of physical activity to survival, artistic development, and classic and popular culture particularly as they have influenced the role of physical activity in the United States. (Prerequisite: Jr. Standing. Next offered Fall 1988.)

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: 1988-89.)

P.E. 421 4 Credits Fall
Physiology of Exercise (3+3) N
Study of the responses and adaptations of the human body to physical work, exercise and systematically applied stressors, including the effects of environmental stressors, especially those specific to northern regions. (Prerequisite: Biol. 111-112.)

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: 1987-88.)

P.E. 432 4 Credits Alternate Fall
Biomechanics of Human Performance (3+3) N
Mechanical analysis of human movement, focusing both internally on musculo-skeletal interactions and externally on the body with the environment, for the purpose of understanding how man moves. (Prerequisites: Biol. 111-112, Math. 107. Next offered: 1987-88.)

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: 1988-89.)

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. 205 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: Completion of 8 credits from 211-222. Next offered: 1988-89.)

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. 103 for Phys. 104 or permission of instructor.)

Phys. 113 1 Credit Fall
Concepts of Physics (1+0)
A general review of experimental and theoretical studies of fundamental interactions of nature which have been recognized as major advances in human knowledge will be given. Application of these discoveries to modern technologies, such as solid state electronics, lasers, holography, nuclear fusion, medical diagnostics, remote sensing, etc., will be presented.

Phys. 211 4 Credits Fall and Spring
Phys. 212 4 Credits Fall and Spring
General Physics (3+3) n
Classical physics using calculus for majors in mathematics, physical sciences, and engineering. Laboratory Fee: $5.00. (Prerequisites: At least concurrent registration in Math. 201, Phys. 211 for Phys. 212, or permission of instructor.)

Phys. 213 4 Credits Spring
Elementary Modern Physics (3+3) n
Geometrical and physical optics: elementary-level modern physics including special relativity, atomic physics, nuclear physics, solid-state physics, elementary particles, simple transport theory, kinetic theory, and concepts of wave mechanics. (Prerequisites: Phys. 211 and 212 or permission of instructor.)

Phys. 275 3 Credits — Fall
Phys. 276 3 Credits — 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.)

Phys. 311 4 Credits — Fall
Phys. 312 4 Credits — Spring
Mechanics (4 + 0) n
Newtonian mechanics, motion of systems of particles, rigid body statics and dynamics, moving and accelerated coordinate systems, Lagrangian and Hamiltonian mechanics, continuum mechanics, theory of small vibrations, tensor analysis, rigid body rotations, special theory of relativity. (prerequisites Phys. 211 and at least concurrent enrollment in Math. 302; Phys. 311 for Phys. 312, or permission of instructor.)

Phys. 313 4 Credits — 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.)

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 or permission of instructor.)

Phys. 381 2 Credits — Fall
Phys. 382 2 Credits — Spring
Physics Laboratory (0 + 6) n
Laboratory experiments in classical and modern physics. (Prerequisite: Phys. 213, Phys. 381 for Phys. 382, or permission of instructor.)

Phys. 411 4 Credits — Fall
Phys. 412 4 Credits — 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, Phys. 411 for Phys. 412, or permission of instructor.)

Phys. 445 3 Credits — 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.)

Phys. 462 3 Credits — 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 or permission of instructor.)

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.Phys. 611 or equivalent, for Phys. 612. Next offered: 1987-88.)

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: 1988-89.)

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: 1988-89.)

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. (Permission of instructor and Phys. 631, or equivalent, for Phys. 632. Next offered: 1988-89.)

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. (Prerequisites: Permission of instructor and Phys. 651, or equivalent, for Phys. 652. Next offered: 1988-89.)

Political Science

P.S. 101 3 Credits — Fall and Spring
Introduction to American Government and Politics (3 + 0) s
Principles, institutions, and practices of American national government; the Constitution, federalism, interest groups, parties, public opinion, and elections.

P.S. 102 3 Credits — Fall and Spring
Introduction to American Government and Politics (3 + 0) s
A survey of outstanding problems in policy areas of defense, energy, economic policy, civil rights, technology, social welfare, business regulation, pollution, and education.

P.S. 110 1 Credit — Fall and Spring
Parliamentary Procedures (1 + 0)
(Same as ANS. 110)
Introduction to the rules and principles of parliamentary procedures and their application to group decision-making processes.

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. Specific topics to be covered in different semesters. (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. (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 the state's government and politics, including political history (as a territory and state), Constitution, political parties, interest groups, elections, public opinion, Governor, Legislature, Judiciary, administration; local government and public policy issues.

P.S. 211 3 Credits — Alternate Fall
State and Local Government (3 + 0) s
Forms, functions, and policies of state and local governments in the United States. Intergovernmental relations and comparative analysis of the politics of the 50 states. (Next offered: 1987-88.)

P.S. 212 3 Credits — Alternate Spring
Introduction to Public Administration (3 + 0) s
(Same as Just. 259)
Theories and practice of public administration, especially as applied to federal agencies. Study of organization, planning, and decision making in implementing public policy. (Next offered: 1988-89.)

P.S. 250 3 Credits — Fall
History of the Law (3 + 0) s
(Same as Just. 250)
An introduction to the history of law in Western civilization with an emphasis on the development of Anglo-American law in America.

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 ethnic leadership issues, history of federal Indian policy, evolution of Native leadership, village and regional government, land claims, and community politics from the Alaska Native brotherhood to ANCSA to the Alaska Native Coalition.

P.S. 301 3 Credits Alternate Fall
American Presidency (3+0) s
A study of the institution of the presidency in the American political system. (Prerequisite: P.S. 101 or consent of instructor. Next offered: 1988-89.)

P.S. 302 3 Credits Alternate Spring
Congress and Public Policy (3+0) s
A study of the American Congress in the political system. (Prerequisite: P.S. 101. Next offered: 1987-88.)

P.S. 303 3 Credits Fall
Introduction to Legal Processes (3+0)
(Same as Just. 303)
The purpose and function of law in society, with a focus on legal reasoning and decisionmaking in civil cases. (Prerequisites: P.S. 101, Just. 110.)

P.S. 310 3 Credits Alternate Fall
The Politics of Post-Industrial States (3+0) s
Political systems of societies which have completed their industrial revolutions. The problem of the welfare state, the no-growth society, the end of ideology, the loss of the work ethic, identity in homogeneous societies. Countries: 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: 1987-88.)

P.S. 311 3 Credits Alternate Spring
Government and Politics of the Soviet Union (3+0) s
A survey of Soviet institutions and political processes. (Prerequisites: P.S. 201 or permission of instructor. Next offered: 1987-88.)

P.S. 312 3 Credits Alternate Fall
Government and Politics of China (3+0) s
Modern Chinese politics and society, including government institutions, political processes, foreign relations, and U.S.-China relations (Prerequisites: P.S. 201 or consent of instructor. Next offered: 1988-89.)

P.S. 315 3 Credits Alternate Spring
American Political Thought (3+0) s
Political ideas in the United States from colonial times to the present: Puritanism, revolutionary ideas, Constitutionalism, nature of the Union, Progressive movement, pragmatism. (Prerequisite: P.S. 101 or consent of instructor. Hist. 131 and 132 strongly recommended. Next offered: 1988-89.)

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 Alternate Spring
International Law and Organizations (3+0) s
International law, regional and international organizations, and nonstate actors in the world system, arms control and disarmament, international political integration. (Prerequisites: P.S. 101 and 102 or permission of instructor. Next offered: 1988-89.)

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 Alaska emphasizing the organization of Native governance federal Indian Law and Alaska state chartered local government with comparisons between Alaska Native political development and those of tribes in the contiguous 48 states and northern hemisphere tribal people. (Prerequisites: Hist. 100, P.S. 263.)

P.S. 330 3 Credits Spring
Law and Society (3+0) s
(Same as Just. 330)
Study of moral issues related to the proper reach, extent, and enforcement of the law. (Prerequisites: P.S. 101 or Just. 110.)

P.S. 400 3 Credits Fall
Political Science Research Methods (3+0) s
Methods, techniques, applications of political science and policy research including research design and planning; sampling, survey research methods, content analysis, observation, 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
How organizations and groups in the U.S. behave. Focus on political parties, labor unions, business, and ethnic associations. Class research project on impact of organizations in modern political life. (Prerequisites: P.S. 101, 102 and 400 or permission of instructor. Next offered: 1988-89.)

P.S. 402 3 Credits Alternate Spring
Political Behavior: Individuals (3+0) s
How individuals behave in the U.S. polity. Focus on political parties, labor unions, business, and ethnic associations. Class research project on 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: 1988-89.)

P.S. 403 3 Credits Alternate Spring
Public Policy (3+0) s
Discussion of the way in which the policy process works and how policy analysis is carried out. Examples of policy issues from recent cases, especially in Alaska. (Prerequisites: P.S. 101 and junior standing. Next offered: 1987-88.)

P.S. 404 3 Credits Spring
(Same as Just. 404)
Introduction to Legal Research and Writing (3+0)
The methods of legal research and preparation of legal materials. Introduction to the resources of law libraries and the techniques of presenting issues in legal form. (Prerequisites: P.S. 101, Just. 110, Just./P.S. 303.)

P.S. 411 3 Credits Alternate Fall
Classical Political Theory (3+0) h
Political ideas from ancient Greece, Rome, and the Judaeo-Christian tradition. Theories of Plato, Aristotle, Cicero, Augustine, and Aquinas. (Prerequisites: P.S. 101 and 102 or consent of instructor. Next offered: 1987-88.)

P.S. 412 3 Credits Alternate Spring
Modern Political Theory (3+0) s
Political ideas from the Renaissance to the modern world. Theories of Machiavelli, Hobbes, Locke, Rousseau, Burke, Marx, and Lenin. (Prerequisites: P.S. 101 and 102 or consent of instructor; P.S. 411 strongly recommended. Next offered: 1987-88.)

P.S. 415 3 Credits Alternate Fall
Contemporary Political Theory (3+0) s
Theories of types of democratic regimes, including individualist and socialist. Analysis of underlying values and structural differences, drawing upon contemporary national state cases. (Prerequisites: P.S. 101 and 102 or permission of instructor; P.S. 412 strongly recommended. Next offered: 1988-89.)

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 emphasis on the influence of social, political, and economic factors on the behavior of courts. (Prerequisites: P.S. 101 and 102 or permission of instructor. Next offered: 1988-89.)

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. (Prerequisite: P.S. 101. Next offered: 1988-89.)

P.S. 437 3 Credits Alternate Spring
Foreign Policy (3+0) s
U.S. foreign policy in the post-war world, including development of policy (domestic and 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: 1987-88.)

P.S. 475 3 Credits Fall and Spring
Internship in Public Affairs (3+0)
Study of public agencies or organizations through actual experience. (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, functions, and procedures of the United Nations. Can be taken for any combination of parts A, B, C for a total of 6 credits.

P.S. 480A Model U.N.: Member Nations Fall
Introduction to United Nations organization and procedures. 1 credit (may be repeated for a maximum of 2 credits).

P.S. 480B Model U.N.: Simulation Spring
Introduction to the use of simulation in international policymaking and administration, focusing on a United Nations member nation. 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. 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
Relationship of the international environment (topography, demography, natural resources, technological change, and divergent patterns of economic development) and world politics. (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. (Also available via television as a self-paced, computer-aided course; special telecourse fee: $20.00.)

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: 1987-88.)

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
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. 345 3 Credits Fall
Abnormal Psychology (3 + 0)
A study of abnormal behavior, its causes, treatment, and social impact. The major classifications of disorders are presented. (Prerequisite: Psy. 101.)

Psy. 350 3 Credits Alternate Spring
Comparative Psychology (3 + 0) s N
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: 1988-89.)

255

Psy. 355 3 Credits Fall
Foundations of Counseling I (3 + 0)
(Same as HMSV 350) 255
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 be surveyed if they are in fairly wide use. Counseling ethics will be studied and ethical problems illustrated and discussed. (Prerequisites: Psy./Soc. 340.) Psy 101, 240 or permission of instr.

Psy. 356 3 Credits Spring
Foundations of Counseling II (3 + 0)
(Same as HMSV 351)
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. (Prerequisites: HMSV 350 or Psy. 355.)

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: 1987-88.)

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: 1987-88.)

Psy. 445 3 Credits Fall
Community Psychology (3 + 0) s
(Same as HMSV 445)
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, HMSV 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 N
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: 1987-88.)

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: 1988-89.)

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. 638 3 Credits Spring
Social Policy and Social Change (3 + 0)
(Same as Soc. 638)
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)

Psy. 645 3 Credits Spring
Prevention Theories and Strategies (3 + 0)
(Same as Soc. 645)
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)

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 4 Credits Fall
Principles and Techniques of Individual Counseling (3 + 3)
(Same as Coun. 623)
A survey of the major theoretical systems of counseling and a limited practice in basic techniques. Major systems include cognitive, behavioral, psychodynamic, perceptualphenomenological, and existential approaches. Actual practice in techniques of listening, helping, session management, problem identification, and goal setting. (Prerequisites: Coun. 615 and/or 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 3 Credits Fall
General Assessment and Testing (3 + 0)
Examines issues of reliability and validity of tests to include cross-cultural issues of test fairness and usage. Surveys achievement, intelligence and personality tests and behavioral and community assessment. Issues and ethics in testing as well as computer applications are discussed. (Prerequisites: Graduate status in Community Psychology or 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. Next offered: 1988-89.)

Psy. 666 3 Credits Spring
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 Spring
Existential Psychotherapy (3+0)
Focus on ultimate concerns rooted in the individual's existence. Theoretical and therapeutic approaches to existential issues such as death, freedom, isolation/relationship, meaning/meaninglessness, and suffering. Euro-American, Native American and Eastern concepts and practices will be examined. (Prerequisite: Permission of instructor. Next offered: 1988-89.)

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)
(Same as Coun. 624)
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 Alternate 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. Next offered 1988-89.)

Psy. 678 3 Credits Alternate 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. Hands-on experience will be required. (Prerequisite: Permission of instructor. Next offered 1988-89.)

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 3-12 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 adequately supervised and may involve more than one site. Graded Pass/Fail. (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: 1987-88.)

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, 1987-88; Russ. 303, 1988-89.)

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: 1987-88.)

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: 1988-89.)

Rural Development

R.D. 200 3 Credits Fall
Community Development in the North (3+0)
Examines rural community development efforts in Circumpolar countries and the impact of these efforts on Northern communities and indigenous peoples.

→ R.D. 255 - Rural AK Land Issues

R.D. 265 3 Credits Fall
Perspectives on Subsistence in Alaska (3+0)
Examines the socio-economic, cultural, legal and political dimensions of subsistence lifestyles in Alaska.

R.D. 300 3 Credits As Demand Warrants
Rural Development and Rural Communities (3+0) S
A comparative and theoretical approach to the process of change and development in cross-cultural contexts, particularly in relation to their effects on rural communities. (Prerequisite: junior standing or permission of instructor.)

R.D. 325 3 Credits As Demand Warrants
Community Organization and Development Strategies (3+0) S
Examines community development/organizational strategies appropriate for a variety of institutional and community situations.

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, activities related to the needs of Native corporations, rural communities and the rural school districts, including practical experience in grant writing.

R.D. 325 - Women & Development (s)

R.D. 400 3 Credits As Demand Warrants
Rural Development Internship
Structured experience in an appropriate educational, agency or corporate setting. An approved project required. Enrollment only by prior arrangement with the instructor.

R.D. 425 - Cultural Impact Analysis

R.D. 450 3 Credits As Demand Warrants
Managing Community Development Projects and Programs (3 + 0)
Examines 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 SWK in Human Services Fall and Spring
~~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.

SWK. 306 3 Credits 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. 360 3 Credits Alternate Spring or As Demand Warrants
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: SWK 103 or permission of instructor.)

SWK. 442 3 Credits 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, Soc. 101, Psy. 240 and senior standing.)

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.)

SWK. 484 3 Credits As Demand Warrants
Seminar in Social Work Practice Areas (3 + 0)
The course covers problem areas in which social work is involved. Allows students to learn application of basic social work skills in special settings. Problem areas are covered separately in different semesters. Content will be announced in class schedule prior to each semester offered. Course may be repeated for credit when topic varies. (Prerequisites: SWK. 103, HMSV 201, junior or senior standing, or permission of instructor.)

Sociology

Soc. 101 3 Credits New description 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. (Also available via television as a self-paced, computer-aided course; special telecourse fee: $20.00.)

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. (Also available via television as a self-paced, computer-aided course; special telecourse fee: $20.00. Prerequisite: Soc. 101.)

Soc. 201 3 Credits New description 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 new description 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. 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. (Next offered: 1988-89.)

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: 1988-89.)

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. 335 3 Credits Fall
Sociology of Deviant Behavior (3+0)
A study of the causes of deviant behavior, both criminal and non-criminal, with emphasis on the nature of social interaction and an examination of the social control groups and institutions. (Prerequisite: Soc. 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: 1987-88.)

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: 1988-89.)

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: 1987-88.)

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: 1987-88.)

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: 1987-88.)

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 Spring
Social Policy and Social Change (3+0)
(Same as Psy. 638.)
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)
(Same as Psy. 645.)
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 International Programs.)

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: 1987-88; Span. 303: 1988-89.)

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: 1987-88.)

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: 1988-89.)

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 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. Next offered: 1987-88)

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. Next offered: 1987-88.)

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: 1987-88.)

SPAS 629 3 Credits Alternate Fall
Methods of Numerical Simulation in Fluids and Plasma (3+0) (Same as MSL 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. Next offered: 1987-88.)

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 or permission of instructor. Next offered: 1988-89.)

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 or permission of instructor. Next offered: 1988-89.)

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. Next offered: 1988-89.)

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. Next offered 1988-89.)

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 or permission of instructor. Next offered: 1988-89.)

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 or permission of instructor. Next offered: 1987-88.)

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. Next offered: 1987-88.)

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. Next offered: 1987-88.)

Speech Communication

Because of enrollment pressures, it is Department of Speech and Drama policy to drop from the class roll students who fail to attend the first two meetings of a basic course (Speech Communication 121, 131 and 141) even if they have preregistered.

Sp.C. 121 **3 Credits** **Fall and Spring**
Fundamentals of Oral Communication: Interpersonal Emphasis (3+0) o
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) o
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) o
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** **Spring**
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. 231 **3 Credits** **Alternate Years**
Business and Professional Communication (3+0) h
A pre-professional course designed to help business, professional, and communication students enhance their oral communication skills, focusing on superior/subordinate communication, interviewing, conference and meeting techniques, and presentational speaking. (Prerequisites: Any 100 level oral communication course or permission of instructor. Next offered: Spring 1988.)

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: Fall 1988.)

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 1987.)

Sp.C. 282 **3 Credits** **Alternate Years**
Communication Research Methods (3+0)
Empirical and rhetorical-critical research methodologies employed in communication studies, including assumptions, key issues, and applications. (Prerequisites: Any 100 level oral communication course or permission of instructor. Next offered: Spring 1989.)

Sp.C. 320 **3 Credits** **Alternate Years**
Communication and Language (3+0)
The role of language and meaning in human communication. (Prerequisite: Any lower division speech communication course or permission of instructor. Next offered: Spring 1988.)

Sp.C. 321 **3 Credits** **Alternate Years**
Nonverbal Communication (3+0) s
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: Fall 1987.)

Sp.C. 322 **3 Credits** **Alternate Years**
Interpersonal Communication (3+0) h
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. Next offered: Fall 1987.)

Sp.C. 330 **3 Credits** **Alternate Years**
Intercultural Communication (3+0) s
The nature and the sources of problems in communication that may arise when persons with different cultural backgrounds interact. Special emphasis on problems in intercultural communication in Alaska. (Prerequisite: Any lower division Speech Communication course or permission of instructor. Next offered: Fall 1988.)

Sp.C. 331 **3 Credits** **Alternate Years**
Group Communication (3+0)
Current research and theory in intergroup and intragroup relations. Topics will include the study of leadership, power, group structure, participation, and conflict. (Prerequisites: Any 100 level Speech Communication course or permission of instructor. Next offered: Fall 1988.)

Sp.C. 335 **3 Credits** **Alternate Years**
Organizational Communication (3+0) s
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: Spring 1988.)

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. (Prerequisite: Any lower division Speech Communication course or permission of the instructor. Next offered: Spring 1989.)

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: Spring 1989.)

Sp.C. 441 **3 Credits** **Alternate Years**
Persuasion (3+0) s
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 300 level Speech Communication course or permission of the instructor. Next offered: Spring 1989.)

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. (Prerequisite: Any 300 level oral communication course or permission of the instructor. Next offered: Fall 1988.)

Sp.C. 475 3 Credits — Alternate Years
Speech Communication in Education and Training (3+0)
Issues pertaining to the research and development of instructional units in speech communication for educational and professional courses. Issues covered include student needs analysis, syllabi development, behavioral objectives, unit packages, competency, models, and program integration. (Prerequisites: Any 300 level Speech Communication course or permission of instructor. Next offered: Fall 1988.)

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: Fall 1987.)

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 and Spring
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: 1987-88.)

Thr. 241 3 Credits — Fall
Basic Stagecraft (2+2) h
Materials of scene construction and painting and their use.

Thr. 321 3 Credits — Spring
Acting II (1+4) h
Building a character; role study and performance of small scenes. (Prerequisite: Thr. 221, or admission by arrangement.)

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: 1987-88.)

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: 1988-89.)

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. (Students will spend approximately $40 for materials.) (Prerequisite: Thr. 241 or permission of instructor. Next offered: 1988-89.)

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: 1988-89.)

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: 1988-89.)

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
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: 1988-89.)

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
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: 1987-88.)

Thr. 412 3 Credits — Alternate Years
Theater History II (3+0) h
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: 1988-89.)

Thr. 413 3 Credits — Alternate Fall
Playscript Analysis (3+0) h
Intensive investigation of the structure of playscripts designed to develop skills in analyzation and interpretation for performance. (Prerequisites: Junior Standing, Thr. 211 or permission of instructor. Next offered: 1987-88.)

Thr. 421 3 Credits — As Demand Warrants
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.)

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.)

Thr. 456 3 Credits — Alternate Spring
Intermediate Costuming (3+0) h
Study of theatrical costuming materials and methods. Special projects concerning drafting, construction, composition and design. (Prerequisites: Thr. 211, Thr. 354 or permission of instructor. Next offered: 1988-89.)

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. Laboratory fee: $10.00. (Prerequisites: Biol. 271 and A.L.R. 101.)

W.F. 302 2 Credits Alternate Fall
Fish and Wildlife Ecology and Management (1+3)
Introduction to ecology and management of wildlife and fish populations. Identification, life history and management of Alaskan birds, mammals and commercial and sport caught fish. Laboratory fee: $10.00. (Prerequisites: A.L.R. 101 or Biol. 104, 105-106 or permission of instructor. Next offered: 1988-89.)

W.F. 304 1-3 Credits Fall and Spring
Wildlife Internships
Programs designed to provide undergraduate students with practical experience in wildlife management in public or private agencies. Projects are approved by faculty member and supervised by professional agency staff. Not substitutable for courses required for major. (Prerequisites: Permission of instructor.)

W.F. 305 3 Credits Alternate Fall
Concepts of Animal/Wildlife Diseases (2+3)
Basic concenpts of parasitic, infectious, environmental, and nutritional diseases. Specific study of Alaskan wildlife diseases. Basic sterile technique, treatment and chemical immobilization. Laboratory fee: $10.00. (Prerequisites: Biol. 105, 106 or equivalent and permission of instructor. Next offered: 1988-89.)

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. Laboratory fee: $10.00.

W.F. 382 3 Credits Alternate Fall
Biology of the Freshwater Fish of Alaska (3+0)
Life histories of Alaskan freshwater fish emphasizing species sought by fishermen. Emphasis is on reproduction, age, growth, migration, food, inter-relationships, and habitat requirements. (Prerequisite: Biol. 105-106 or permission of instructor. Next offered: 1987-88)

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. Laboratory fee: $10.00. (Prerequisites: W.F. 301 and A.S. 301.)

W.F. 402 3 Credits Spring
Advanced Wildlife Biology and Management (2+3)
Explores and analyzes complex management situations involving predator-prey groups and groups of competing or otherwise interrelated species. Discussion of theory and issues in habitat and ecosystem management at varying geographic scales. (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 forest ecosystems including major groups of birds and mammals. Biological, economic, and political factors important in the conservation of major species. (Prerequisites: Biol. 425 and Biol. 426 or permission of the instructor. Next offered: 1987-88.)

W.F. 419 3 Credits Alternate Fall
Waterfowl and Wetlands Ecology and Management (3+0)
Distribution and abundance of North American waterfowl. Ecology of waterfowl, shorebirds and furbearers and their associated wetland habitats. Management of populations including harvest and manipulation of habitats. Field trips to important wetlands in Alaska. (Prerequisite: Biol. 271, 426 or permission of the instructor. Next offered: 1987-88.)

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. Laboratory fee: $10.00. (Prerequisites: Chem. 106 and Biol. 271, or permission of the instructor.)

W.F. 424 2 Credits Alternate Spring
Aquatic Entomology (1+3)
Ecology, taxonomy, anatomy, physiology, and evolution of aquatic insects. Laboratories emphasize identification and field/laboratory techniques. Laboratory fee: $10.00. (Prerequisites: Biol. 105-106, 271 and W.F. 423 recommended or permission of instructor. Next offered: 1987-88.)

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. Laboratories emphasize analyses of actual data and samples. Laboratory fee: $10.00. (Prerequisites: Biol. 271, W.F. 423 recommended, or permission of instructor. Next offered: 1988-89.)

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. Laboratory fee: $10.00. (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. To show relevance of the biological, economic, social, and political aspects of management, examples of several fisheries are used. (Prerequisites: Biol. 271 and Biol. 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: 1987-88.)

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)
The dynamics of herbivory, emphasizing the grazing process, and including mechanisms of feeding, feeding behavior, habitat and plant selection, physiological influences on feeding, plant and community level responses, plant defenses against herbivory and management of grazing systems. (Prerequisite: graduate standing or approval of instructor. Next offered: 1988-89.)

W.F. 615 2 Credits Alternate Fall
Advanced Topics in Wildlife Management (2+0)
Political, economic, administrative and ecologic aspects of wildlife management in northern regions. (Prerequisite: graduate standing in biology, fisheries or wildlife or permission of instructor. Next offered: 1987-88.)

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. Laboratory fee: $10.00. (Prerequisites: Admission by arrangement: minimal preparation, equivalent to Biol. 271, Math. 200 and A.S. 301. Next offered: 1988-89.)

W.F. 625 3 Credits Alternate Fall
Fish Ecology (2+3)
The ecology of fish is examined from the community aspect. Current literature on inter- and intraspecific relationships, influence of the environment on community structure, behavior and production is emphasized. Laboratory fee: $10.00. (Prerequisites: W.F. 423, and W.F. 429. Next offered: 1987-88.)

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: 1988-89.)

W.F. 692 1 Credit Fall and Spring
Graduate Seminar (0+0+1)
Topics in fish and wildlife management explored through readings, talks, group discussions and guest speakers with a high level of student participation. Joint seminars in fish and wildlife management will be scheduled one semester and separate seminars will be scheduled the other. (Prerequisite: graduate standing or permission of instructor.)

Regina Fanelli, a sophomore and starter on the UAF women's volleyball team, relaxes in one of the many comfortable areas in the Rasmuson Library. Fanelli came to UAF from Manitou Springs, Colo.

Valerie Honea, a freshman majoring in business administration, is from Ruby, Alaska.

Register

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c/o Arthur Young & Co., 1031 W. 4th, Suite 600
Anchorage 99501 279-0422

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318 4th St., Juneau 99801 586-3210

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1800 Branta, Juneau 99801 789-2155
(Past President)

Lance Bousley (1986-1988)
1970A Glacier Hwy
Juneau 99801 789-4537

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c/o Polaris Investments, 427 First Ave.
Fairbanks 99701 452-5571

Mark H. Helmericks (1987-1995)
c/o C.E.S., Inc., 8600 Sultana Dr.
Anchorage 99516 345-0594

Edward B. Rasmuson (1975-1981) (1981-1989)
P.O. Box 600, Anchorage 99510 265-2930
(Past President)

John C. Sackett (1987-1993)
D-304, 1873 East Tudor Road
Anchorage 99507 561-4824

Susan A. Stitham (1987-1995)
P.O. Box 80913
Fairbanks 99708 ..... 456-7794, ext. 135

Robert Franklin Williams (1985-1993)
P.O. Box 5555, Kenai 99611 776-8161

Emeriti

Bedford, Jimmy, Professor of Journalism, Emeritus. University of Missouri '50, A.M.; '51, B.J.; '52, M.A. (1965-1981)

Behlke, Charles M., Dean, School of Engineering, Professor of Civil Engineering, Emeritus. Washington State University '48 B.S.; '50, M.S. Stanford University '57, Ph.D.; P.E. (1950-1954, 1965-1980)

Beistline, Earl H., Dean, School of Mineral Industry, Professor of Mining, Emeritus. University of Alaska '39, B.Min. Engr.; '47, E.M.; '69, LL.D. (Hon.); P.E. (1946-1982)

Belon, Albert E., Professor of Physics, Emeritus. University of Alaska '52, B.S.; University of California, Los Angeles '54, M.A.; University of Alaska '84, D. Sc. (Hon.) (1956-1983)

Brundage, Arthur L., Professor of Animal Science, Emeritus. Cornell University '50, B.S.; University of Minnesota '52, M.S.; '55, Ph.D. (1968-1985)

Burdick, John L., 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)

Carlson, Axel R., Professor of Extension, Emeritus. Michigan State University '53, B.S.; Pennsylvania State University '66, M.S. (1965-1980)

Cashen, William R., Professor of Mathematics and Marshal of the University, Emeritus. University of Alaska '37, B.S.; University of Washington '48, M.A. (1942-1974) Deceased

Clark, Bettie H., Head, Alumni Services and Career Planning and Placement, Emeritus, University of Alaska '35, B.S. (1962-1972)

Clark, Vena A., Associate Professor of Home Economics, Emeritus. Cotner College '25, A.B.; Iowa State University '33, M.S. (1953-1967)

Clutts, Joan B., Professor of Education, Emeritus. Colorado College '51, B.A.; University of Missouri '85, M.Ed.; '69, Ed.D. (1961-1984)

Cook, Donald, 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)

Cutler, Howard A., 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)

Dafoe, Don M., Executive Vice President, Emeritus. Valley City State College '37, B.A.; University of Idaho '48, M.S.; Stanford University '61, Ed.D. (1966-1976)

Darnell, Frank, Professor of Education, Emeritus. Colorado State University '51, B.S.; University of Alaska '62, M.Ed.; Wayne State University '70, Ed.D. (1966-1978)

Davis, Charles W., Professor of Music, Emeritus. State University of Iowa '37, B.A.; '48, M.A. (1963-1979)

Davis, T. Neil, 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)

Dinkel, Don H., Professor of Plant Physiology, Emeritus. University of Minnesota '54, B.S.; '60, Ph.D. (1960-1966, 1968-1983)

Fohn-Hansen, Lydia, 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)

Forbes, Robert B., Professor of Geology, Emeritus. University of Washington '50, B.S.; '59, Ph.D. (1959-1977)

Gilmore, John C., Professor of Physical Education, Emeritus. Stanford University '54, B.A.; '58, M.A.; '67, Ed.D. (1968-1984)

Gordon, Bruce R., 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)

Griese, Arnold, Professor of Education, Emeritus. Georgetown University '48, B.A.; University of Miami '57, M.Ed.; University of Arizona '60, Ph.D. (1960-1980)

Harbo, Samuel J., Professor of Wildlife Management and Biometrics, Emeritus. University of Nebraska '51, B.S.; University of Alaska '58, M.S.; North Carolina State University, Raleigh '72, Ph.D.

Hessler, Victor P., Professor of Geophysics, Emeritus. Oregon State University '26, B.S.; Iowa State University '27, M.S.; '34, Ph.D. (1955-1968)

Hood, Donald W., 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)

Hunt, William, Professor of History, Emeritus. Seattle University '51, B.S.S.; University of Washington '58, J.D.; '66, M.A.; '67, Ph.D. (1967-1979)

Irving, Laurence, 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

Jones, Laura, Director of Admissions and Registrar, Emeritus. University of Denver '41, B.A. (1956-1971) Deceased.

Keim, Charles J., Professor of Journalism and English, Emeritus. University of Washington '48, B.A.; '50, M.A. (1954-1977)

Keller, William K., 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

Leekley, James R., Senior Scientist in Charge, Petersburg Fur Farm, Emeritus. Oregon State University '38, B.S. (1941-1972)

Logsdon, Charles E., Professor of Plant Pathology, Emeritus. University of Kansas City '42, B.A.; University of Minnesota '54, Ph.D. (1953-1978)

Mather, Keith B., Director of the Geophysical Institute, Emeritus and Professor of Physics, Emeritus. Adelaide University '42, B.Sc.; '44, M.Sc.; University of Alaska '68 (Hon.) D.Sc.

Miller, Orlando W., Professor of History, Emeritus. Muhlenberg College '47, B.A.; Columbia University '48, M.A.; '66, Ph.D. (1957-1978)

Moore, Terris, 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)

Morrison, Peter R., Professor of Zoophysiology, Emeritus. Swarthmore College '40, A.B.; Harvard University '47, Ph.D. (1963-1974)

Morrow, James E., Professor of Zoology, Emeritus. Middlebury College '40, A.B.; '42, M.S.; Yale University '44, M.S.; '49, Ph.D. (1960-1977)

Novatney, Dorothy H., Professor of English, Emeritus. Pomona College '28, B.A.; Claremont College '30, M.A.; Teachers College '38, Ed.D. (1943-1945, 1956-1963)

Parthasarathy, Raghavaiyengar, Professor of Physics, Emeritus. Annamalai University '50, B.S.; '52, M.S. (1958-1980)

Rae, Kenneth M., Vice President for Research and Professor of Marine Science, Emeritus. University College, London '35, B.Sc.; '58, Ph.D. (1961-1976)

Renner, Louis L., 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)

Rice, Elbert F., 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

Rogers, George W., Professor of Economics, Emeritus. University of California, Berkeley '42, B.A.; '43, M.A.; Harvard University '50, Ph.D. (1960-1983)

Romick, Gerald J., 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)

Rowinski, L. J., Director of University of Alaska Museum, Emeritus. Cornell University '51, B.S.; University of Alaska '58, M.S. (1957-1980)

Ryberg, H. Theodore, Director of Libraries, Emeritus. Gettysburg College '55, A.B.; Western Reserve University '57, M.S. (1962-1980)

Sargent, Charles, 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)

Senungetuk, Ronald W., Professor of Art, Emeritus. Rochester Institute of Technology '60, A.A.S. and B.F.A.; Statens Handvaerks og Kunstindustriskole, Oslo, Norway '61, Diploma.

Slotnick, Herman E., Professor of History, Emeritus. University of Idaho '39, B.A.; University of Washington '58, Ph.D. (1955-1978)

Smith, R. London, 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)

Sunnell, Agnes S., Associate Professor of Extension, Emeritus. University of Washington '31, B.S.; Washington State University '44, M.S. (1960-1970)

Tiedemann, James B., Professor of Mechanical Engineering Emeritus. University of Wisconsin '45, B.S.; '49, M.S.; '55, Ph.D.; P.E.

Tilly, Lola Cremeans, Professor of Home Economics, Emeritus. University of Illinois '20, A.B.; '21 M.S.; University of Alaska '63, D.Hum. (1929-1937, 1942-1963)

Wells, Minnie, Professor of English, Emeritus. University of Missouri '25, B.S.; New York University '38, Ph.D. (1945-1971)

Wilson, Charles R., Professor of Physics, Emeritus. Case Institute of Technology '51, B.S.; University of New Mexico '56, M.S.; University of Alaska '63, Ph.D.

Wilson, William S., 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

Wood, William R., President Emeritus. Illinois College '27, A.B.; '60, LL.D. (Hon.); University of Iowa '36, M.A.; '39, Ph.D. (1960-1973)

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  - Center for Cross-Cultural Studies, Gerald Mohatt, Director
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  - Agricultural and Forestry Experiment Station, James V. Drew, Director
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- School of Mineral Engineering, Donald Cook, Dean
  - Mineral Industry Research Laboratory, Donald Cook, Director
  - Petroleum Development Laboratory, G.D. Sharma, Director

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- Operations, Ron Keyes, Director
- Student Affairs, Richard Stenard, Dean of Students

UNIVERSITY OF ALASKA-FAIRBANKS ASSEMBLY
- Fairbanks Assembly, John Whitehead, President (1985-87)

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:

AFES	Agricultural and Forestry Experiment Station
ATHREC	Athletics and Recreation
CHRD	College of Human and Rural Development
CLA	College of Liberal Arts
CNS	College of Natural Sciences
GI	Geophysical Institute
IAB	Institute of Arctic Biology
IMS	Institute of Marine Science
INE	Institute of Northern Engineering
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.

Ahmadian, Majid — 1985 — Visiting Assistant Professor of Economics (1985), SOM. State University of New York at Buffalo '84, Ph.D.

Aigner, Jean S. — 1978 — Professor of Anthropology (1978), Head, Department of Anthropology (1986), CLA. University of Wisconsin '64, B.A.; '66, M.A.; 69, Ph.D.

Akasofu, Syun-Ichi — 1958 — Director of the Geophysical Institute (1986) and Professor of Geophysics (1964). 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 — Associate Professor of Art History and Humanities (1985) and Head, Department of Philosophy and Humanities, (1982), CLA; University of Zurich '75, Ph.D.

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.

Allison, Richard C. — 1968 — Professor of Geology (1975), CNS. University of Washington '57, B.S.; '59, M.S.; University of California '67, Ph.D.

Anderson, James H. — 1970 — Research Associate (1976), IAB. University of Washington '63, B.S.; Michigan State University '70, Ph.D.

Andresen, Marvin J. — 1985 — Associate Professor of Business Administration (1985), SOM. University of Missouri '60, 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.

Armbruster, W. Scott — 1980 — Assistant Professor of Botany (1983), CNS, 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 — Associate Professor of Speech Communication (1985), CLA. Rensselaer Polytechnic Institute '63, B.S.; '64, M.S.; Michigan State University '71, Ph.D.

Arundale, Wendy H. — 1979 — Senior Research Associate (1979), IAB. Brown University '67, A.B.; Michigan State University '72, M.A.; '76, Ph.D.

Aspnes, John D. — 1978 — Professor of Electrical Engineering (1981), and Head, Department of Electrical Engineering (1983), SENG. University of Wisconsin '65, M.S.; Montana State University '76, Ph.D.; P.E.

Bailey, Ira S. — 1982 — Master, R/V ALPHA HELIX (1982), IMS.

Bailey, Ray P. — 1976 — 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), CNS, IMS. Arizona State University '65, B.A.; '68, M.S.; Michigan State University '70, Ph.D.

Barnes, Brian M. — 1986 — Assistant Professor of Reproductive Endrocrinology (1986), IAB, CNS. University of California, Riverside '77, B.S.; University of Washington '83, 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.

Barnhill, Anthony L. — 1985 — Assistant Professor of Military Science (1985), CLA. University of Science and Arts of Oklahoma '76, B.S.; Tennessee Technological University '82, M.B.A.

Baron, Mary K. — 1978 — Professor of English and Head, Department of English (1985), CLA. Brandeis University '69, A.B.; University of Michigan '71, A.M.; University of Illinois '73, Ph.D.

Barrick, Kenneth A. — 1985 — Assistant Professor of Geography (1985), CLA. Shippenburg University of Pennsylvania '74, B.A.; '78 M.S.; Southern Illinois University-Carbondale '82, M.S.; '83, Ph.D.

Bartlett, DorisAnn — 1982 — Instructor of English and Humanities (1985), CLA. Middlebury College '55, B.A.; University of Alaska-Anchorage '73, M.A.; University of Oregon '77, Ph.D.; '81, M.A.

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.

Batten, Allan R. — 1976 — Research Associate (1976), UAM. Colorado State University, Fort Collins '66, B.S.; University of Alaska-Fairbanks '77, M.S.

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 — 1968 — 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.

Bennett, Kathleen P. — 1986 — Assistant Professor of Education (1986), CHRD. East Stroudsburg State College '71, B.S.; Xavier University '77, M.Ed., University of Cincinnati '86, Ed.D.

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.

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 — Associate Professor of English (1986), 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.

Black, Lydia T. — 1984 — Professor of Anthropology (1985), CLA. Northeastern University '69, B.S.; Brandeis University '71, M.A.; University of Massachusetts, Amherst '73, Ph.D.

Blakeslee, Linda P. — 1986 — Advanced Nurse Practitioner, Center for Health and Counseling (1986), STUAFF. Loyola University of Chicago '80, B.S.N.; Simmons College, Boston '84, M.S.

Book, Patricia A. — 1986 — Director of Conferences and Continuing Education (1986), Oakland University '72, B.A.; University of Connecticut '75, M.A.; '80, Ph.D.

Booker, John — 1983 — Associate Professor of Sociology (1983), CHRD. University of South Alabama '70, B.A.; Florida State University '75, M.S.; '77, Ph.D.

Borgeson, Cory — 1983 — Adjunct Assistant Professor of Business Administration (1985), 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), CNS. Radcliffe '63, A.B.; University of Alaska '67, M.S.; '70, Ph.D.

Bowyer, R. Terry — 1986 — Assistant Professor of Wildlife Ecology (1986), CNS, IAB. Humboldt State University '70, B.S.; '76, M.S.; University of Michigan '85, 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.

Braley, W. Alan — 1981 — Research Associate (1983), INE. University of South Florida '76, B.A.; University of Alaska-Fairbanks '80, M.S.

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), Associate Director, INE (1986), INE. University of Minnesota '70, B.S.; University of Wisconsin '73, M.S.; '75, Ph.D.

Brown, Neal — 1966 — Director, Poker Flat Research Range (1983), GI. and Assistant Professor of Geophysics (1969), CNS. Washington State University '61, B.S.; University of Alaska '66, M.S.

Bruce, Leroy Ben — 1984 — Assistant Professor of Animal Science (1986), SALRM. New Mexcio State University '73, B.S.; '77, M.S.; '79, Ph.D.

Bryant, John P. — 1985 — Assistant Professor of Plant Ecology (1985), IAB, CNS. Colorado State University '66, B.A.; University of Calgary '68, M.S.; University of Alaska-Fairbanks '84, Ph.D.

Burrell, David Colin — 1965 — Professor of Marine Science (1975), IMS. Nottingham University '61, B.Sc.; '64, 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 Juilliard 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.

Carnarsky, Maurine — 1985 — Instructor of Library Science (1985), LIB. Kendall College '68, A.A.; Roosevelt University '70, B.A.; University of Hawaii-Manoa '84, M.L.S.

Carling, Donald E. — 1981 — Associate Professor of Horticulture (1986), 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), SENG. University of Wisconsin '61, B.S.; '63, M.S.; '67, Ph.D.; P.E.; P.L.S.

Carr-Lundfelt, Cathi — 1984 — Director of Employee Relations (1984), VCA. University of Alaska '67, B.A.; '71, M.A.

Caulfield, Richard A. — 1985 — Instructor of Rural Development (1985), CHRD. University of California-Berkeley '73, B.S.; '73, B.A.

Cedzo, Karen L. — 1979 — Director of Office of University Relations (1985). 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 III, F. Stuart — 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.

Clausen, Thomas — 1975 — Senior Research Associate (1982), IAB. University of Alaska-Fairbanks '75, B.S.; Michigan State University '80, Ph.D.

Cochran, Verlan L. — Affiliate Associate Professor of Agronomy (1985), SALRM. California State Polytechnic College '66, B.S.; Washington State University '71, M.S.

Coetzee, Nicolaas F. — 1982 — Associate Professor of Civil Engineering (1982), and Head, Department of Civil Engineering (1986), 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.

Colligan-Taylor, Karen — 1984 — Assistant Professor of Japanese (1986), CLA. University of California, Berkeley '71, B.A.; '75, M.A.; Stanford University '85, Ph.D.

Comiskey, Albert L. — 1979 — Adjunct Associate Professor of Meteorology, (1979), AEIDC. University of California, Los Angeles '50, B.A.

Conley, Edgar G. — 1986 — Assistant Professor of Mechanical Engineering (1986), SENG. Michigan State University '71, B.S.; '79, M.S.; '86, Ph.D.; P.E.

Conn, Jeffrey S. — 1980 — Affiliate 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 — Dean, School of Mineral Engineering (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.

Cooney, R. Theodore — 1970 — Associate Professor of Marine Science (1976), IMS. University of Washington '64, B.S.; '67, M.S.; '71, Ph.D.

Cooper, Brian A. — 1985 — Research Associate I (1985), IAB. University of Montana '80, B.S.; University of Alaska-Fairbanks '84, M.S.

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 — Assistant Professor of Library Science (1986), LIB. University of Toronto '62, B.A.; University of Michigan '66, A.M.L.S.

Cornwall, Peter G. — 1971 — Associate Professor of History (1973), CLA. University of Toronto '62, B.A.; University of Michigan '63, A.M.; '70, Ph.D.

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, 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.

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. 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, CNS. Reed College '58, B.A.; University of Alaska '61, M.S.; '68, Ph.D.

Degen, Vladimir — 1969 — Associate Professor of Physics (1974), GI, CNS. 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.

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 — Professor of Mathematics (1974), CLA. Montana State University '53, B.S.; '55, M.S.

Dixon, E. James — 1974 — Associate Professor of Archaeology (1982), Curator, Archaeology Collection (1974). UAM. University of Alaska '70, B.A.; '72, M.A.; Brown University '79, Ph.D.

Drew, James V. — 1976 — 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 — Associate Professor of Music (1986), CLA. University of Washington '73, B.A.; B.Mus; Michigan State University '78, M.M.; '82, Ph.D.

Dunton, Kenneth H. — 1986 — Research Associate (1986), INE. University of Maine '75, B.S.; Western Washington University '77, M.S.; University of Alaska-Fairbanks '85, 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.

Ebbesson, Sven O.E. — 1985 — Professor of Medical Sciences and Director, WAMI Medical Education Program (1985), CNS. Southwestern College '57, B.S.; University of Maryland '64, Ph.D.

Echelmeyer, Keith A. — 1984 — Research Associate (1984), GI. University of Colorado '76, B.S.; California Institute of Technology '79, M.S.; '83, Ph.D.

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.

Egnatoff, Karl J. — 1984 — Director of Physical Plant (1984), VCA. University of North Dakota '55, B.S.

Ellanna, Linda J. — 1986 — Assistant Professor of Anthropology (1986), CLA. University of Washington '66, B.A.; University of Wyoming '72, M.A.; University of Connecticut '83, Ph.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.

England, Gerald M. — 1964 — Director of Utilities Operation (1984), VCA. Southern Alberta Institute of Technology '63.

Engstrom, Larry — 1985 — Assistant Professor of Music (1985), CLA. California State University '81, B.A.; North Texas State University '83, M.M.

Ensign, Jr., Walter G. — 1969 — 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.

Ernst, Rolf — 1974 — Executive Officer (1986), LIB. Idaho State University '68, B.S.

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.

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.

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, CNS. University of Cincinnati '60, A.B.; University of California, Berkeley '69, Ph.D.

Fink, Milton A. — 1968 — 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, (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.

Freedman, Michael A. — 1985 — Associate Professor of Mathematics (1985), CLA. Cornell University '69, B.S.; Massachusetts Institute of Technology '71, M.S.; Georgia Institute of Technology '79, Ph.D.

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 — Associate Professor of Geophysics (1985). GI, CNS. 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.; University of Alaska '79, M.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, Irvine '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.

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CREDITS

Credits:

All photos were taken by the University Relations photographer, **Samuel Winch,** except those on page 80. The rocket photo is courtesy of the Geophysical Institute, and the photo of the *R/V Alpha Helix* is by George Landreth of the Institute of Marine Science.

Cover Photos:

Front cover clockwise from left:

Kerry Jones, a UAF sophomore in business administration, jogs on one of the bicycle paths on campus.

The C.T. Elvey Building, home of the Geophysical Institute, is located on the university's West Ridge, where most of the organized research at UAF is located.

Student John Vecsey (right) and a friend talk between Summer Sessions classes.

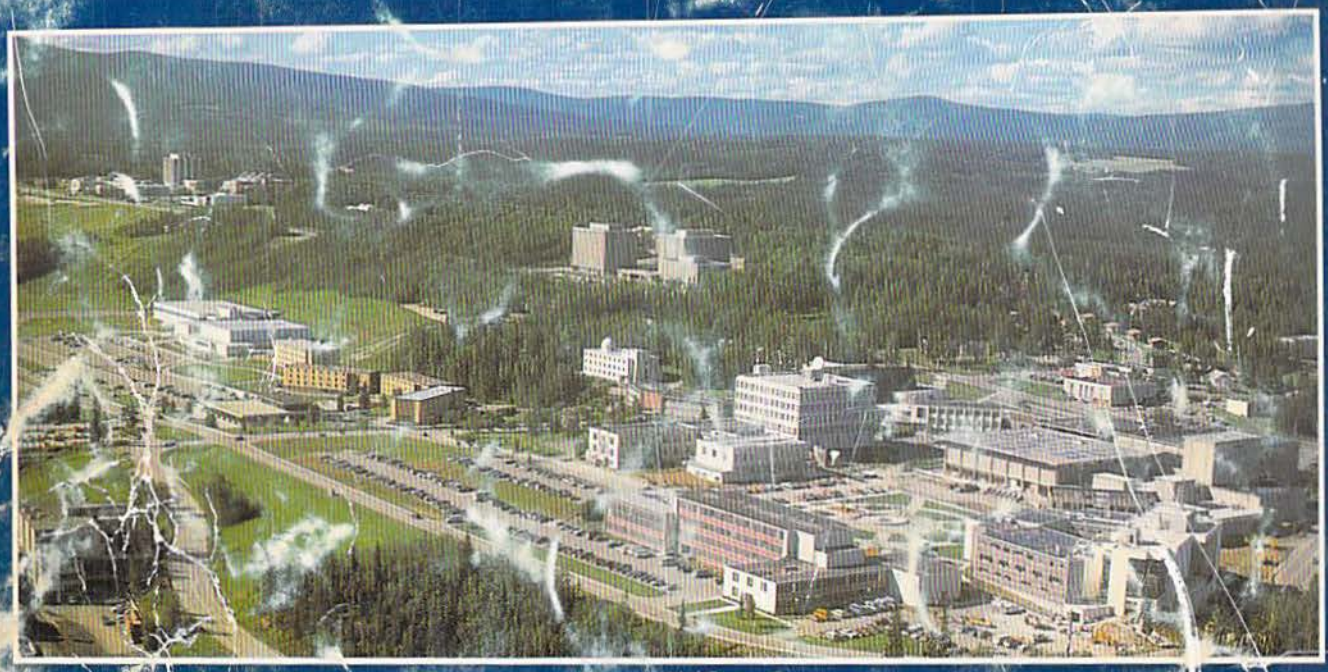
Clear, mild, sunny weather is common in Fairbanks in the winter. Here, students are walking to the upper dorm complex after classes.

Back cover:

The 2,250-acre University of Alaska-Fairbanks campus is situated on a ridge overlooking Fairbanks and the Alaska Range.

At the 1986 commencement, Laurie Oppel, a 1986 graduate in electrical engineering, was presented to the audience by Chancellor Patrick O'Rourke for recognition as the recipient of the Marion Francis Boswell Award for the outstanding graduating senior woman. In the background is Roy Huhndorf, president of the University of Alaska Board of Regents.

Notes



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