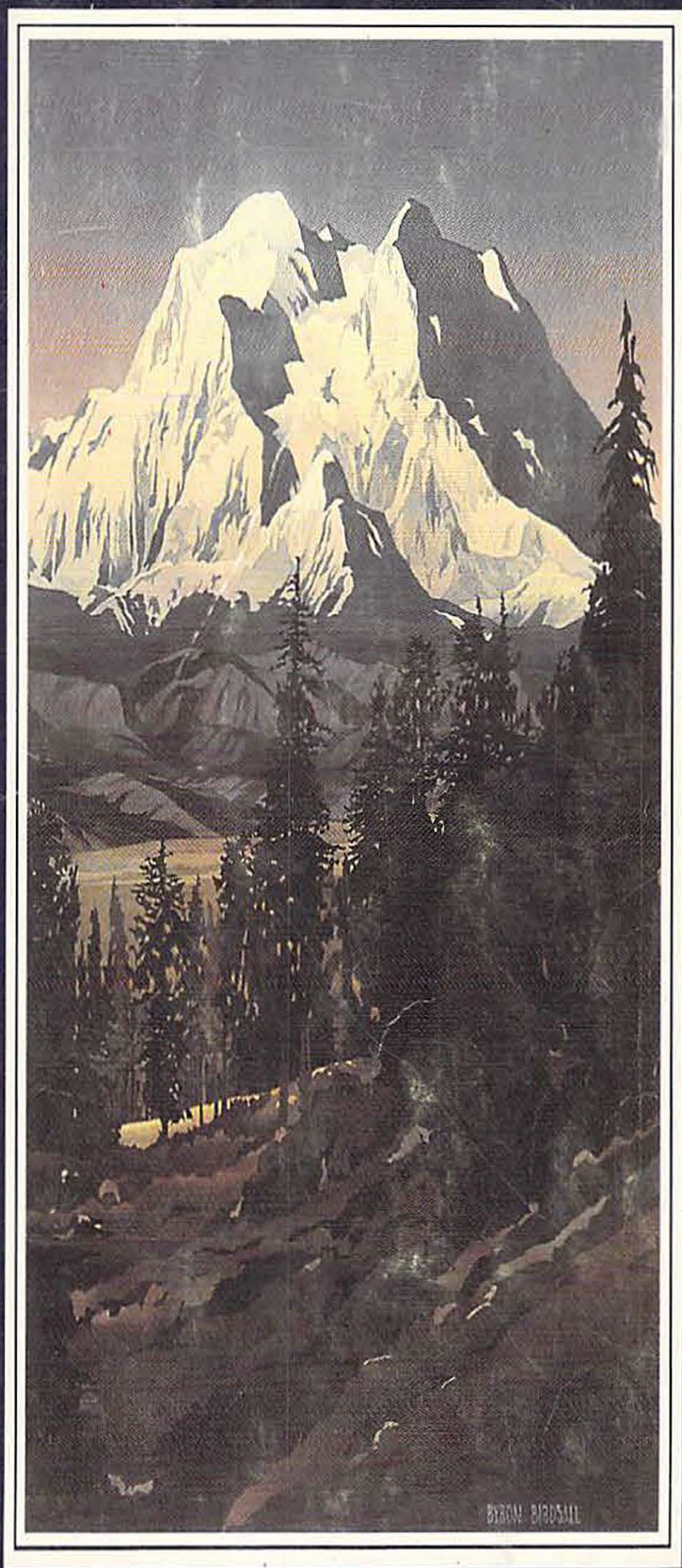


UNIVERSITY OF ALASKA FAIRBANKS



**1988-90  
Graduate Catalog**

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 facilities in Fairbanks, Anchorage, Bethel, Juneau, 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.

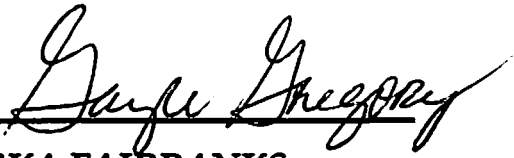
It is the policy of the University of Alaska to provide equal education and employment opportunities and to provide services and benefits to all students and employees without regard to race, color, religion, national origin, sex, age, disability, status as a Vietnam era or disabled veteran, marital status, changes in marital status, pregnancy or parenthood, pursuant to 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 1978, the Public Health Service Act of 1971, the Veteran's Readjustment Assistance Act of 1974, the Vocational Rehabilitation Act of 1976, 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 18.80.010 et. seq., and 14.18.010, et. seq., and 36.30.010, et. seq. Inquiries regarding application of these and other regulations should be directed either to the University of Alaska Fairbanks, Director of Employee Relations; 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; such changes shall become effective upon whatever time periods are required by applicable statutes, university regulations or program requirements.



---

**UNIVERSITY OF ALASKA FAIRBANKS**

**1988 - 90 GRADUATE CATALOG**

---

**Office of the Graduate School  
305 Signers' Hall  
University of Alaska Fairbanks  
Fairbanks, Alaska 99775-0820  
(907) 474-7464**



UNIVERSITY OF ALASKA FAIRBANKS

We invite you . . .

. . . to consider the Graduate School at the University of Alaska Fairbanks for your advanced studies.

As a comprehensive land-grant and sea-grant institution, UAF offers graduate programs in the natural and social sciences, humanities, and the arts. We are an exceptional institution in areas related to our unique location. The expertise of our scientists and scholars is anchored along the northern edge of the Pacific Rim and extends around the circumpolar north. We serve not only as the University for Alaska, but also as the Arctic institution for the United States and as America's "University of the North."

Although UAF is a small and young institution, it maintains a standing among the top 100 universities in the country in terms of total expenditures for research. We continue to grow and strive for increasing levels of excellence, and we are challenged by the emerging Age of the Arctic and the growing globalization of the human family.

Your decision regarding the pursuit of a graduate degree must, necessarily, be a personal one. Graduate study is a highly individualized and intensive process. It demands your initiative, because it requires creative, unstructured, and rigorous work. Even though our faculty provide advice, guidance, and support, it will be your efforts - in large measure - which ensure your success.

We hope the information contained in this catalog will lead you to pursue graduate study at UAF. Alaska provides a landscape of immense proportions and opportunities. Please write or call us at the Graduate School, or contact any of our faculty with whom you may want to study.

We stand ready to demonstrate our capabilities and to discuss your interests.

With every good wish,

Sincerely,

Luis Proenza,  
Vice Chancellor for Research and  
Dean of the Graduate School

## TABLE OF CONTENTS

### GENERAL INFORMATION

A. University of Alaska Fairbanks . . . . .	1
B. The Graduate Program . . . . .	2
C. Graduate Degrees . . . . .	2
D. List of Graduate Degrees and Programs . . . . .	4

### GRADUATE ADMISSIONS

A. Admission to Graduate Study . . . . .	5
B. Foreign Students . . . . .	5
C. Applying for Admission . . . . .	6

### DEGREE REQUIREMENTS

A. General University Requirements . . . . .	9
B. Graduate Degree Requirements . . . . .	10
C. Master's Degree . . . . .	10
D. Master of Arts in Teaching . . . . .	11
E. Educational Specialist Degree . . . . .	12
F. Engineer of Mines Degree . . . . .	12
G. Doctor of Philosophy Degree . . . . .	13
H. Graduate Degree Programs . . . . .	14

### RESEARCH

A. Research Institutes and Centers . . . . .	17
B. Academic and Research Support . . . . .	23
C. State and Federal Agencies . . . . .	24

### FEES

A. Tuition . . . . .	27
B. Fee Definitions . . . . .	27
C. Housing Fees . . . . .	28
D. Other fees . . . . .	28
E. Residency Information . . . . .	29
F. Payment of Fees . . . . .	30
G. Financial Obligations . . . . .	30
H. Refunds . . . . .	30

### FINANCIAL AID

A. Eligibility for Aid . . . . .	33
B. Continuation of Aid . . . . .	33
C. Financial Aid Deadlines . . . . .	33

D. Financial Aid Definitions . . . . .	34
E. Who May Apply for Financial Aid? . . . . .	34
F. Loans . . . . .	35
G. Scholarships and Fellowships . . . . .	36
H. Research and Teaching Assistantships . . . . .	37
I. Work and Study Loads . . . . .	38

**HOUSING INFORMATION**

A. General Information . . . . .	39
B. Residence Hall Application Procedures . . . . .	40
C. Residence Hall Fees . . . . .	41
D. Meal Ticket . . . . .	41
E. Family Housing . . . . .	42

**STUDENT INFORMATION**

A. General Responsibilities . . . . .	43
B. Disabled Students . . . . .	43
C. Student Rights and Responsibilities . . . . .	43
D. Additional Academic Opportunities . . . . .	43
E. Other Campus Services . . . . .	44

**ACADEMIC REGULATIONS**

A. Student Responsibilities . . . . .	47
B. Graduate Advisory committee . . . . .	50
C. Majors . . . . .	51
D. Graduate Study Plan . . . . .	51
E. Advancement to Candidacy . . . . .	52
F. Examinations . . . . .	52
G. Language/Research Tool Requirement . . . . .	54
H. Submission of Theses . . . . .	55
I. Registration Regulations . . . . .	57
J. Change of Major . . . . .	57
K. Requests for Exceptions . . . . .	58
L. Graduation . . . . .	58

**DEPARTMENTS AND CURRICULA**

A. College of Liberal Arts . . . . .	59
Anthropology	
Computer science	
English	
History	
Mathematics	
Music	
B. College of Natural Sciences . . . . .	67
Atmospheric Sciences	
Biology	

Chemistry	
General Science	
Geology and Geophysics	
Physics	
Space Physics	
Wildlife Management	
C. Rural College . . . . .	74
Behavioral Sciences and Human Services	
Community Psychology	
Guidance and Counseling	
College Student Personnel Administration	
Education	
Type B Administrative certificate	
Teacher Certification	
Teachers for Alaska Program	
D. School of Agriculture and Land Resources Management . . . . .	86
Natural Resources Management	
E. School of Engineering . . . . .	88
Arctic Engineering	
Civil Engineering	
Electrical Engineering	
Engineering and Science Management	
Environmental Quality Engineering and Science	
Mechanical Engineering	
F. School of Fisheries and Ocean Sciences . . . . .	95
Program in Fisheries	
Graduate Program in Marine Sciences and Limnology	
Oceanography	
G. School of Management . . . . .	98
Business Administration	
Economics	
H. School of Mineral Engineering . . . . .	102
Geological Engineering	
Mining Engineering	
Mineral Preparation Engineering	
Petroleum Engineering	
<b>COURSE DESCRIPTIONS . . . . .</b>	<b>109</b>
<b>FACULTY AND STAFF . . . . .</b>	<b>180</b>
<b>UNIVERSITY OF ALASKA FAIRBANKS OFFICERS . . . . .</b>	<b>201</b>
<b>UNIVERSITY OF ALASKA BOARD OF REGENTS . . . . .</b>	<b>202</b>
<b>INDEX . . . . .</b>	<b>203</b>
<b>CAMPUS MAP . . . . .</b>	<b>208</b>

## CALENDAR

### FALL SEMESTER, 1988

1988		
September	3-5, Sat.-Mon.	Early Orientation for New Students
	6, Tuesday	Registration Materials and Advisors Available
	6-7, Tues.-Wed.	Registration: Course Selection
	8-12, Thurs.-Mon.	Registration: Fee Payment
	8, Thursday	Classes Begin
	14, Wednesday	Last Day of Late Registration
October	14, Friday	Graduation Application Due
November	9, Wednesday	Last Day for Student-Initiated Withdrawals
	24-25, Thurs.-Fri.	Thanksgiving Holidays
December	9, Friday	Last Day of Instruction
	12-15, Mon.-Thurs.	Final Examinations
	19, Monday, Noon	Grades Due to Admission and Records from Faculty

### SPRING SEMESTER, 1989

1989		
January	16-17, Mon.-Tues.	Early Orientation for New Students
	16, Monday	Registration Materials and Advisors Available
	17-18, Tues.-Wed.	Registration: Course Selection
	19-23, Thurs.-Mon.	Registration: Fee Payment
	19, Thursday	Classes Begin
	25, Wednesday	Last Day of Late Registration
February	15, Wednesday	Graduation Application Due
March	13-17, Mon.-Fri.	Spring Recess
	29, Wednesday	Last Day for Student-Initiated Withdrawals
April	21, Friday	All Campus Day (no classes)
	28, Friday	Last Day of Instruction
May	1-4, Mon.-Thurs.	Final Examinations
	7, Sunday	Commencement
	8, Monday, Noon	Grades Due to Admission and Records from Faculty

### SUMMER SESSIONS, 1989

1989		
May	30, Tuesday	Registration for First 6-Week and 12-week Session
		First 6-Week and 12-Week Sessions Begin
June	30, Tuesday	Registration for 3-Week Session
	5, Monday	3-Week Session Begins
	23, Friday	Last Day of Classes for 3-Week Session
July	4, Tuesday	Holiday, No Classes
	7, Friday	Last Day of Classes for First 6-Week Session
	10, Monday	Registration for Second 6-Week Session
	10, Monday	Second 6-Week Session Begins
	14, Wednesday	Graduation Application Due
August	18, Friday	Last Day of Classes for 12-Week and Second 6-Week Sessions



**FALL SEMESTER, 1989**

<b>1989</b>		
<b>September</b>	5-6, Tues.-Wed. 6, Wednesday	Orientation for New Graduate Students Registration Materials and Advisors Available
	7-8, Thurs.-Fri. 11-14, Mon.-Thurs.	Registration: Course Selection Registration: Fee Payment
	11, Monday 15, Friday	Classes Begin Last Day of Late Registration
<b>October</b>	16, Monday	Graduation Application Due
<b>November</b>	8, Wednesday	Last Day for Student-Initiated Withdrawals
	23-24, Thurs.-Fri.	Thanksgiving Holidays
<b>December</b>	12, Tuesday	Last Day of Instruction
	13-16, Wed.-Sat.	Final Examinations
	18, Monday, Noon	Grades Due to Admission and Records from Faculty

**SPRING SEMESTER, 1990**

<b>1990</b>		
<b>January</b>	15-16, Mon.-Tues. 15, Monday	Early Orientation for New Students Registration Materials and Advisors Available
	16-17, Tues.-Wed. 18-22, Thurs.-Mon.	Registration: Course Selection Registration: Fee Payment
	18, Thursday 24, Wednesday	Classes Begin Last Day of Late Registration
<b>February</b>	15, Thursday	Graduation Application Due
<b>March</b>	12-16, Mon.-Fri. 28, Wednesday	Spring Recess Last Day for Student-Initiated Withdrawals
<b>April</b>	20, Friday 27, Friday	All Campus Day (no classes) Last Day of Instruction
<b>May</b>	30 Monday 1-3, Tues.-Thurs. 6, Sunday 7, Monday, Noon	Final Examinations Final Examinations Commencement Grades Due to Admission and Records from Faculty

**NOTE:** Dates are subject to change.



Archaeology field school students (front to back: Evelyn Russell, Andrew Higgs, and Sonja Matson) excavate the outer edges of the Walker Road Site located near Healy. This site is believed to contain the oldest artificial structure in Alaska, and possibly in North America. UAF photo/Sam Winch

---

## **GENERAL INFORMATION**

### **University of Alaska Fairbanks**

#### **Special Mission**

The University of Alaska Fairbanks, (UAF) is the land-grant and sea-grant institution for the state of Alaska. As the state's primary residential institution, it serves students from all areas of Alaska as well as from many other states and nations. UAF offers master's degree programs in the arts, sciences, and professions and doctoral programs in natural sciences and mathematics.

The University of Alaska Fairbanks is the state's center for basic and applied research, with particular emphasis on high latitude and Alaskan problems. In response to global and state needs, UAF has developed programs in space physics, marine science, atmospheric science, geophysics, biology, environmental sciences, and engineering. It is also deeply involved in research and instruction related to managing and developing Alaska's natural resources and protecting its environment. UAF is the state's major center for the study of Alaska Native cultures.

In addition, UAF serves as a cultural center for interior Alaska by offering activities and programs in the creative and performing arts. Its museum and Alaska and Polar Regions library collection provide major cultural and information resources to the state.

UAF is a public coeducational institution with an enrollment of 8365 students, including 550 graduate students among the 5200 students in Fairbanks.

#### **Location/Transportation**

The city of Fairbanks is located in the interior of the state. Fairbanks is served by air, rail from Anchorage and by road. Fairbanks has a population of 35,000 and is within the Fairbanks North Star Borough with a total population of 75,000.

The University of Alaska Fairbanks is located just northwest of town, surrounded by rural residential areas. 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.

#### **Accreditation/Memberships**

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

In addition, for certain programs UAF has received the accreditation extended by specialized national agencies, including the American Chemical Society, the American Assembly of Collegiate Schools of Business, the Accreditation Board for Engineering and Technology, the American Association of Museums, the Accreditation Council on Education in Journalism and Mass Communication, the National Association of Schools of Music, the National Council for Accreditation of Teacher Education, and 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 for the baccalaureate degree.

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.

UAF also 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.

## UAF Governance

Students (ASUA, Associate Students of UAF), faculty (Faculty Senate) and staff (Staff Council) are represented by individual governance structures which address their concerns. The UAF Assembly provides a forum for the three individual governance bodies to address common concerns.

ASUA is responsible for those issues which are uniquely student affairs issues. The Faculty Senate is responsible for those issues which are academic and faculty concerns. The Staff Council is responsible for those issues which are uniquely staff affairs issues.

Actions by each governance body are forwarded for consideration to the Chancellor's office which shares in the responsibility for campus governance. All governance activities are subject to Board of Regents policy.

## 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 both male and female students. This means that there will be no discrimination on the basis of sex in every program, policy and practice of the University of Alaska Fairbanks. Areas covered by this law include: admissions, financial aid, counseling, health services, student activities and programs, and access to course offerings. All concerns that relate to Title IX are to be directed to the Fairbanks campus Title IX coordinator in Room 101 of the Etelson Building.

## The Graduate Program

### Organization

Graduate study at the University of Alaska Fairbanks is administered by the Office of the Graduate School located in 305 Signers' Hall. The Graduate School coordinates graduate programs, courses, admissions standards, and degree requirements; enforces regulations; recommends changes in graduate policy to the Graduate Council; and acts on petitions requesting changes from existing regulations.

### Graduate Council

The Graduate Council is elected from the graduate faculty in each of the UAF schools and colleges. The Graduate Council meets regularly to consider and advise on matters related to UAF graduate program operations and policies. To ensure that rigor and quality are maintained in graduate programs the Council assists in monitoring student admissions, student and advisory committee performance, thesis and course quality, and will establish and monitor a system of regular program evaluation. The Council also assists in the selection and award of general university or external fellowships, assists in the establishment of a broad base of private financial support for graduate study, and assists in relations with outside agencies concerned with higher education and professional school accrediting agencies.

## Graduate Degrees

### Master's Degrees

Master's degrees are offered in the humanities, social sciences, computer science, mathematics, physical and natural sciences, and professional areas such as engineering, education and business administration. Students wishing to enroll for graduate studies 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, 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 an interdisciplinary program should contact the Office of the Graduate School.

Several cross-discipline master's degrees are offered through cooperating departments. The Master of Arts in Teaching is offered with emphasis in the following disciplines: biology, chemistry, 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 the Graduate School.

### **Doctor of Philosophy Degrees**

The University of Alaska Fairbanks offers doctoral programs in certain areas of anthropology, mathematics, physics, geophysics, geology, biological sciences, oceanography, wildlife management, and zoology.

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.

### **Interdisciplinary Programs**

Interdisciplinary master's and doctoral degree programs may be arranged in specialized areas for which there are not established programs at UAF, or programs may be arranged for specific plans of study involving a combination of disciplines. Interdisciplinary study requires that students be mature and well-focused. Applicants must submit a proposal for the program they wish to pursue including their thesis topic and outline; recommended advisory committee members who are familiar with the proposal, qualified and willing to serve; a time-table for completion of degree requirements; and letters of recommendation. In short, what is required is a nearly complete Graduate Study Plan in advance of acceptance.

This proposal is submitted to the Office of Admissions and Records and the student's file is forwarded to the Office of the Graduate School when complete. An ad hoc faculty committee then reviews the application. Final admission requires approval by the Dean of the Graduate School. The purpose of the review is to determine if UAF has the facilities and faculty expertise capable of fulfilling the requested program in the applicant's particular area of interest, and also to determine whether the applicant's academic background indicates capability for satisfactory completion of the degree program proposed.

Interdisciplinary programs require extra responsibility and effort from both the student and the faculty. Students must carefully plan their program and maintain communications with the advisory committee throughout the course of study. Contact the Graduate School office for application information.

### **Specialized Programs/WICHE/WRGP**

The Western Interstate Commission for Higher Education (WICHE) has selected UAF arctic, circumpolar, and cold regions studies as part of the unique or specialized graduate programs it coordinates in the western states as the Western Regional Graduate Programs (WRGP). Residents of Arizona, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, Utah, Washington, and Wyoming, who major in one of these programs pay resident tuition at UAF. The programs included are: arctic engineering, atmospheric sciences, biology, botany, fisheries, geology, geophysics, marine biology, mining engineering, natural resources management, oceanography, space physics, wildlife management, and zoology. Contact the Graduate School office for more information.

## Graduate Degrees and Programs

- 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

- Anthropology, M.A., Ph.D.
- Arctic Engineering, M.S.
- Atmospheric Sciences, M.S., Ph.D.
- Biology, M.S., M.A.T., Ph.D.
- Botany, M.S.
- Business Administration, M.B.A.
- Chemistry, M.A., M.S., M.A.T.
- Civil Engineering, M.C.E., M.S.
- College Student Personnel Administration, M.Ed.
- Computer Science, M.S.
- Education, Ed.S.
  - Cross-Cultural Studies
  - Public School Administration
- Education, M.Ed.
  - Cross-Cultural Curriculum and Instruction
  - Educational Administration
  - Language and Literacy
- Electrical Engineering, M.S., M.E.E.
- Engineering Management, M.S.
- English, M.A., M.F.A.
- Environmental Quality Engineering, M.S.
- Environmental Quality Science, M.S.
- Fisheries Science, M.S.
- General Science, M.S.
- Geological Engineering, M.S.
- Geology, M.S.
  - Economic Geology
  - General Geology
  - Petroleum Geology
- Geology, Ph.D.
- Geophysics, M.S.
  - Snow, Ice and Permafrost Geophysics
  - Solid Earth Geophysics
- Geophysics, Ph.D.
- Geosciences, Ph.D.
- Guidance and Counseling, M.Ed.
  - Elementary
  - Secondary
- History, M.A.T.
- Interdisciplinary Studies Option, M.A., M.S., Ph.D.
- Marine Biology, M.S.

- Mathematics, M.S., M.A.T., Ph.D.
- Mechanical Engineering, M.S.
- Mineral Preparation Engineering, M.S.
- Mining Engineering, M.S., E.M.
- Music, M.A.
  - Alaska Ethnomusicology
  - Music Education
  - Music History
  - Performance
  - Theory and Composition
- Music, M.A.T.
- Natural Resources Management, M.S.
- Oceanography, M.S., Ph.D.
- Petroleum Engineering, M.S.
- Physics, M.S., M.A.T., Ph.D.
- Psychology, M.A.
  - Community
- Resource Economics, M.S.
- Science Management, M.S.
- Space Physics, M.S., Ph.D.
- Wildlife Management, M.S., Ph.D.
- Zoology, M.S., Ph.D.

# GRADUATE ADMISSIONS

## Admission to Graduate Study

Graduate study seeks to prepare the student for advance 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 the student's experience, academic background, and aspirations. Earning an advanced degree entails more than the satisfactory completion of specified courses; students must show promise and performance in productive scholarship.

In general, students may be admitted to graduate status if they have a bachelor's degree from an accredited institution with at least a 3.0 (B) average in their major, and if their major is deemed suitable for continuation of studies in the field of 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 calculating the grade point average. Program heads will determine the adequacy of the student's preparation and whether or not departmental facilities are sufficient for the student's aims.

Students are advised that permission to enroll in graduate courses does not imply admission to graduate study. A student may not presume that such course work will necessarily be applicable to a graduate program. Admission to graduate study, when approved, does not imply advancement 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 a graduate program. [See Degree Requirements]

## 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 English well enough to do graduate level work successfully.

#### Admission Requirements:

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 when the documents presented for admission do not clearly indicate the applicant's proficiency in English.
3. For graduate admission, applicants must present a TOEFL score of at least 550.

Graduate applicants who present scores below 550 may request a waiver of the TOEFL requirement from the International Student Advisor. The International Student Advisor will make such recommendations subject to final review and approval by the cognizant academic dean and the Dean of the Graduate School.

A waiver will be granted only under exceptional circumstances, at the discretion of the International Student Advisor. 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 work load in the student's major.

The International Student Advisor 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 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 nine graduate credits).

A foreign student must sign a statement that sufficient funds are available to pay all expenses while attending UAF, as well as the amount needed for round trip transportation costs between the student's home and Alaska. The minimum cost for attending UAF for one school year is 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 affirmation that the foreign student does not intend to make the United States a permanent residence, the student may not be considered for resident tuition fees.

## Applying for Admission

### When to Apply

It is recommended that prospective graduate students apply for admission at least six to nine months prior to the beginning of the semester in which they plan to enroll at UAF (twelve months for interdisciplinary degree applicants).

A person cannot make reservations for on-campus housing until the application for admission has been accepted. Therefore, we recommend that application for admission be filed at least ten months prior to the date applicants plan to enroll if they are interested in campus housing.

### How to Apply -- Read Carefully

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

1. **Application for Admission** -- A \$20 processing fee must accompany the completed Graduate 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 the 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 ability to undertake graduate study and research. The letters should be forwarded to the Director of Admissions and Records.
4. **Ph.D. applicants** must submit descriptions of their proposed graduate program and of their professional goals.
5. **Results of the Graduate Record Examination (GRE)** and/or other tests, when required, must be forwarded to the Office of Admissions and Records. Applicants should refer to the admission requirements of the specific degree



- program for which they are applying to ascertain what tests, if any, are required.
6. **Graduate foreign student applicants** should also refer to the previous section on admission requirements for foreign students.
  7. **Interdisciplinary master's or doctoral applicants** must submit a proposed graduate study plan and research proposal, with commitment from a UAF faculty member to chair the student's advisory committee. Contact the Office of the Graduate School for interdisciplinary application procedures.

### **Conditional and Final Acceptance**

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

A qualified applicant can be accepted for admission while currently enrolled in the 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.

### **Immunization Policy**

The University of Alaska 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 on 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 the above.



Una Swain, research assistant at the Institute of Marine Science, monitors the behavior of "Slip," the institute's ring seal, in a study of the way seals navigate under ice. UAF photo/Sam Winch

## **DEGREE REQUIREMENTS**

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

### **General University Requirements**

A graduate student must apply and be admitted to a specific degree program and, in addition, must later be admitted to candidacy for that degree and discipline major.

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 one half of all credits used to meet the degree requirements. Up to 9 credits may be transferred to UAF from another institution to fulfill credit requirements for a graduate degree.

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 (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 the degree.

A graduate student must be registered each semester when 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 resuming 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 the thesis may extend registration by 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 (\$150 fee per semester); and 2) In Residence -- for students needing to use facilities and faculty advisement (\$225 fee per semester). Students on extended registration in residence who are considered full-time by their department and the Graduate Office pay full-time student activity fees and medical insurance fees, and may receive certification of full-time status for deferment of student loans.

A master's student may be granted full-time status by enrolling in extended registration for one semester. An additional extension of one semester may be granted upon the approval of the student's graduate committee and department head. A Ph.D. student may be granted two semesters of full-time status by enrolling in extended registration. One additional semester may be granted upon approval by the committee and department head.

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.

## Graduate Degree Requirements

### English Requirement

All graduate students are expected to have proficiency in written and oral English. If deficiencies are apparent, then the student's advisory committee will determine requirements to remove the deficiencies. Such requirements may not be used in fulfilling the language/research tool requirements.

### Catalog and Time Limits for Degrees

A student enrolled in a graduate degree program may elect to graduate under the requirements of the UAF catalog in effect in the first semester of enrollment in the degree program (the catalog of record), or the catalog in effect at graduation. All course work listed on the student's advancement to candidacy form and all other degree requirements must be satisfactorily completed within the time limits allowed. The limit is seven years for a master's degree and ten years for students pursuing a Ph.D.

## Master's Degree

The University of Alaska Fairbanks offers research-oriented (thesis or project) and practice-oriented (non-thesis) master's degrees. The objective of research-oriented programs is to prepare graduate students for scholarly or research activity directed mainly toward the acquisition of new knowledge, while that of practice-oriented graduate programs is to prepare graduate students for professional practice directed mainly toward application or transmission of existing knowledge. Graduate education should be an intense, coordinated effort, undertaken in a relatively short time and aimed at obtaining professional skills or the ability to do original creative research and scholarly work. A graduate student must meet University standards, department standards and those set by a faculty advisory committee with expertise in the student's study area. Graduate study cannot be a collection of random courses taken beyond the baccalaureate.

All degree requirements must be completed within a seven-year time period. The minimum requirements for a master's degree at the University of Alaska Fairbanks are as follows (departments may have additional requirements):

1. Complete satisfactorily a minimum of 30 semester credits.
  - a. At least 24 semester credits, including those earned for thesis and research/project, must be at the 600-level.
  - b. No 100-200 level credits are applicable toward degree requirements, although the advisory committee may require the removal of certain deficiencies with courses at this level.
  - c. A maximum of 12 semester credits may be devoted to thesis (699) or to thesis and research (699 + 698). When a thesis is required, it must carry six or more credits. In non-thesis programs, a maximum of six credits may be devoted to research/project.
  - d. A maximum of nine semester credits from another institution may be transferred to the University of Alaska Fairbanks and applied toward a degree, if approved by the student's advisory committee and by the dean of the college/school in which the student is enrolled. These credits may be at either the upper-division undergraduate level (300-400) or at the graduate level (600), but they must have been taken after completing the baccalaureate degree and cannot have been used toward a previously earned graduate degree. Such courses must also

- have been taken within the time limits specified for the master's degree.
- e. Students who received their baccalaureate degrees from UAF may include in their programs credits which they reserved for graduate study during the final year of their undergraduate program, provided that the advisory committee accepts them, and provided that the courses were reserved in accordance with the policy as stated in the UAF Catalog.
2. Formulate a unified program, in cooperation with the student's advisory committee, as best fits the needs of the individual student.
    - a. Degree programs must be composed of courses in the discipline or clearly related to and/or supportive of that discipline. All courses to be applied toward the degree must be approved by the advisory committee.
    - b. In some cases, cooperative programs utilizing specific courses from other universities may be developed after a student has been admitted to graduate study at the University of Alaska Fairbanks, has prepared a graduate study plan with the advisory committee, and has received the prior approval of the advisory committee. A minimum of 12 semester credits, in addition to thesis and research, must be completed in residence at the University of Alaska Fairbanks.
    - c. The student's advisory committee may require that certain deficiencies be corrected. These deficiency requirements are considered to be a part of the student's overall graduate study program and must be included in the final program submitted on the Advancement to Candidacy form. If satisfied through course work, these deficiencies, though listed on the Advancement to Candidacy, are not included in the minimum number of credits required for the specific master's degree. The advisory committee will determine, in advance, the method of remedying the deficiencies and the minimum level of performance to be required of the student, and this information will be included on the student's candidacy form. Grades earned in deficiency courses are not included in the grade point average. With the consent of the advisory committee, such courses may be taken under the credit/no-credit option or through credit-by-examination.
    - d. Correspondence courses, credit-by-examination, or courses taken under the credit/no-credit option may not be used in fulfilling the basic course requirements of the degree program. However, with the permission of the advisory committee, these procedures may be used to demonstrate certain proficiencies, i.e., for the language/research tool requirement or to satisfy deficiencies.
  3. In addition to satisfactory completion of a plan of study developed in accordance with the guidelines described above, specific requirements for the master's degree are:
    - a. If required, pass a qualifying examination prior to advancement to candidacy.
    - b. If required, demonstrate proficiency in a language/research tool.
    - c. Pass a comprehensive (final) examination, written and/or oral.
    - d. If a thesis is required, pass an oral defense of thesis examination.
    - e. Submit an application for graduation and be registered in the semester in which the degree is to be awarded.
    - f. Complete all degree requirements within the 7-year time limit allowed.

## 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 Education. NOTE: Students will enroll in a department or program which offers an approved M.A.T. program. The M.A.T. degree at UAF has been approved for the following subject areas: biology, chemistry, geosciences, history, mathematics, music and physics.

**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 for Admission to Graduate Study form.
  - 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 the student's graduate committee 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.

## Educational Specialist Degree

The Educational Specialist (Ed.S.) degree program 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. This program is limited to 1) the Public School Administration area, with particular emphasis on the Superintendent certification, and 2) a cross-cultural education program. For further information regarding this degree program contact the Department of Education. Minimum requirements for the Ed.S. degree are completion of 36 credits after receiving a master's degree and completion of general University requirements and master's degree requirements.

## Engineer of Mines Degree

The Engineer of Mines degree is a professional degree which is awarded to engineering graduates who have a minimum of five years of responsible engineering

experience and who compose and submit an acceptable thesis. For specific degree requirements contact the School of Mineral Engineering.

## Doctor of Philosophy Degree

The Doctor of Philosophy Degree is granted in recognition of scholarly attainment and proven ability. This degree generally will not be conferred upon anyone whose entire academic experience has been at the University of Alaska. University of Alaska Fairbanks staff holding rank of assistant professor (or equivalent) or above are not eligible to become candidates for the Ph.D. at the University of Alaska Fairbanks.

1. Work toward the Ph.D. degree includes at least three full years of study beyond the baccalaureate degree, including up to 9 credits of applicable and acceptable work transferred from other institutions. Generally, a minimum of one and one-half years (three semesters) will be spent in residence at the University of Alaska Fairbanks.
2. There are no fixed course work or credit requirements for the Ph.D. degree other than the requirement of a minimum of 18 credit hours of thesis. The student chooses a major line of study and, with the advice of the advisory committee, supportive lines of study in related fields as are necessary for a thorough and scholarly knowledge of the chosen subject. The advisory committee, together with the student, will work out a coherent and meaningful program, shaped to the needs of the individual student and developed in terms of the student's experience, academic background, and aspirations.

In addition to satisfactory completion of a plan of study developed in accordance with the guidelines described above, specific requirements for the Ph.D. degree are:

- a. Demonstrate competence in a foreign language or a research tool specified by the advisory committee.
- b. Pass a written comprehensive examination.
- c. Complete a minimum of 18 thesis credits and satisfactorily complete a thesis which is a substantial contribution to the body of knowledge in the area.
- d. Pass an oral defense of thesis examination.
- e. Apply for graduation and be registered in the semester in which the degree is to be awarded.
- f. Complete all degree requirements within the 10-year time limit allowed.

## UAF Graduate Degree Programs

### College of Liberal Arts

	Credits
ANTHROPOLOGY	
MA Anthropology*	30
PhD Anthropology	varies
ENGLISH	
MA English*	30
MFA Creative Writing*	45
HISTORY	
MAT History	36
MATHEMATICAL SCIENCES	
MS Computer Science	30
MS Math*	30-35
MAT Math*	36
PhD Math	varies
MUSIC	
MA Music	30
MAT Music	36

### College of Natural Sciences

BIOLOGY AND WILDLIFE	
MS Biology*	30
MS Botany*	30
MS Wildlife Management*	30
MS Zoology*	30
MAT Biology	30
PhD Biology	varies
CHEMISTRY	
MA Chemistry*	30
MS Chemistry*	30
MAT Chemistry	36
GEOLOGY AND GEOPHYSICS	
MS Geology*	30
MS Geophysics*	30
MAT Geology*	30
PhD Geology	varies
PhD Geophysics	varies
PHYSICS	
MS Physics*	30
MS Space Physics*	30
MS Atmospheric Science*	30
MAT Physics*	36
PhD Physics	varies
PhD Space Physics	varies
PhD Atmospheric Science	varies

### College of Rural Alaska

BEHAVIORAL SCIENCES/HUMAN SERVICES	
MA Community Psychology	45-48
MEd Guidance/Counseling (elementary or secondary)	36
MEd College Student Personnel Administration	36
EDUCATION	
MEd Cross Cultural Educ	36
MEd Curric/Instruc	36
MEd Educ Leadership	36
MEd Lang/Literacy	36
EdS (x-cultural or leadership)	36

*MS  
Biological Sciences*



**School of Agriculture and Land Resources Management**

**NATURAL RESOURCES MANAGEMENT**

MS Natural Resource Mgmt\* 30-35

**School of Engineering**

**CIVIL ENGINEERING**

MCE 30

MS Civil Engineering 30

MS Arctic Engineering 30

MS Env Qual Engr 30-33

MS Env Qual Sci 30-33

**ELECTRICAL ENGINEERING**

MEE 32

MS Elec Engr 30

**ENGINEERING AND SCIENCE MANAGEMENT**

MS Engr Mgmt 33

MS Sci Mgmt 33

**MECHANICAL ENGINEERING**

MS Mech Engr 30

**School of Fisheries and Ocean Sciences**

**MARINE SCIENCE AND LIMNOLOGY**

MS Marine Biology\* 30

MS Fisheries Science\* 30-36

MS Oceanography\* 30

PhD Oceanography varies

**School of Management**

**BUSINESS ADMINISTRATION**

MBA\*\* 30-54

**ECONOMICS**

MS Resource Economics\* 31

**School of Mineral Engineering**

**MINING AND GEOLOGICAL ENGINEERING**

MS Geol Engr 30-33

MS Mining Engr 30-36

MS Min Prep Engr 30-33

Engineer of Mines varies

**PETROLEUM ENGINEERING**

MS Petroleum Engr 30-33

**Interdisciplinary Studies**

MA\* varies

MS\* varies

PhD\* varies

**Degree Abbreviations**

**EdS** Educational Specialist

**EM** Engineer of Mines

**MA** Master of Arts

**MAT** Master of Arts in Teaching  
(within a discipline)

**MBA** Master of Business Administration

**MCE** Master of Civil Engineering

**MEd** Master of Education

**MEE** Master of Electrical Engineering

**MFA** Master of Fine Arts

**MS** Master of Science

**PhD** Doctor of Philosophy

\*GRE required for admission

\*\*GMAT required for admission



Dr. Tom Kinney, associate professor of civil engineering, works on a project studying the feasibility of using geotextiles to prevent permafrost problems in Alaska highways. UAF photo/Sam Winch

## RESEARCH

The research programs at UAF take advantage of the university's unique location in the subarctic region of interior Alaska, with easy accessibility to the Pacific and Arctic oceans, 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 research carried out in its academic departments, the university has a number of research institutes and centers that focus on 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.

### Research Institutes and Centers

#### Agricultural and Forestry Experiment Station

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

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

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

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

#### Alaska Cooperative Fishery 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.

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 in 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 manuscripts materials in and on Alaska Native languages. It is available for by scholars and students.

### **Center for Cross-Cultural Studies**

Established in 1971, the center is the research and development unit of the Rural College. 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.

### **Fishery Industrial Technology Center**

The Fishery Industrial Technology Center (FITC), located in Kodiak, is part of the School of Fisheries and Ocean Sciences. FITC is dedicated to the contribution of scientific and technical expertise to the harvesting, processing and marketing efforts of the fishing industry. The center's activities are divided into four major areas -- harvesting technology, seafood processing technology, training and support. Its faculty have expertise in the areas of biochemistry, microbiology and seafood technology and engineering. In order to tap these resources for students within the university system, the School of Fisheries and Ocean Sciences hopes to offer a degree program in seafood science and nutrition in the future. FITC research efforts are often coordinated with the Alaska Sea Grant College Program and the Marine Advisory Program.

### **Geophysical Institute**

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

The research program deals with phenomena that can best be studied at high altitude or which present special problems in Alaska. Programs are established in upper atmospheric physics and chemistry, the aurora, the earth's

magnetic field, radio communications, solar-terrestrial physics, meteorology, glaciology, seismology, volcanology and several fields of geology and geochemistry. An important aspect of much of the work is the application of existing knowledge to polar problems -- for example, improving radio communication services in the Arctic, assessing the earthquake risk in Alaska, studying ice movements and stresses off the north coast as a basis for engineering design of shore facilities, developing alternative energy sources, reducing the effects of ice fog and air pollution, and providing advisory services to local government.

The Geophysical Institute is housed in the C.T. Elvey Building on the West Ridge of the Fairbanks campus. The present staff numbers approximately 200, including 40 faculty members. Financial support is obtained mainly from federal agencies.

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

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

### **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 human beings 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 humanity 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 human beings in a largely natural system.

The institute is located in the Laurence Irving Building 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 (adjacent to the campus), which houses breeding colonies of musk ox, caribou and reindeer, 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 Marine Science**

The Institute of Marine Science was established in 1960 by the Alaska Legislature for the purposes of advancing oceanographic knowledge with an 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.

Current research projects include: studies on 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, R/V 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.

### **Alaska Sea Grant College Program**

The Alaska Sea Grant College Program, which was established in 1970, represents a partnership between the National Sea Grant Program within the National Oceanic and Atmospheric Administration and the University of Alaska. Its purpose is to provide people with the knowledge and means of developing, utilizing and conserving the marine resources of the state and nation through a program of teaching, research and advisory activities.

The Alaska Sea Grant Program administrative office is housed in the Irving II Building on the Fairbanks campus. Sea Grant funded projects can be carried out in cooperation with institutes and units on the various college campuses throughout the state.

The research program includes projects in fisheries oceanography, fisheries sciences, fisheries enhancement, fisheries allocation issues, food science and technology, and aquaculture.

Sea Grant supports continuing programs of information and advisory services. Through the Alaska Marine Advisory Program, Sea Grant supports a personal link with marine industries and coastal communities.

### **Institute of Northern Engineering**

Formerly known as the Engineering Experiment Station/Institute of Water Resources, the Institute of Northern Engineering (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. The school 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 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.

### **Juneau Center for Fisheries and Ocean Sciences**

The Center for Fisheries and Ocean Sciences was officially established in 1974 as part of the Juneau campus of the University of Alaska. Its mandate was to provide instruction in the basic science disciplines and to offer specialized training at both the undergraduate and graduate levels and to conduct research in marine and anadromous fisheries. With the restructuring of the university in 1987, the program became part of the School of Fisheries and Ocean Sciences of the University of Alaska Fairbanks.

Research programs currently include: association of primary production with recruitment of marine fish and invertebrates, aging and growth of larval fish, early life history of commercially important shellfish, pathology of finfish and shellfish, aquaculture of salmon and seaweeds, genetic improvement of salmon brood stocks, molecular genetic stock separation techniques, behavior of brown bear, population dynamics and management of commercially important fish and shellfish, and hydroacoustic stock estimation.

Research facilities are within the three-story Anderson Building (15,000 square feet) located on the shores of Auke Bay, approximately 12 miles north of Juneau. The building is equipped with a high quality seawater system plumbed throughout the first floor and to biological labs on the third floor. A walk-in freezer and coldroom are also located on the ground floor, which houses wet and dry lab research facilities and advanced instrumentation. A modern microcomputer lab, including graphics stations and hydroacoustics lab and image analysis station are located within the building. The center's 42-foot research vessel, R/V MAYBESO, routinely operates in inland waters in southeast Alaska. The center cooperatively operates with the National Marine Fisheries Service, a research salmon hatchery located on Auke Creek, adjacent to the grounds.

Financial assistance for graduate students is provided through research assistantships from state, federal and industry funded grants to the center.

### **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 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, a 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 which will 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 these 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 the 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 Archaeological 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 archaeology. A laboratory and support facilities are maintained for students, faculty and visiting scholars for conducting archaeological research.

The Ethnographic Collection contains over 14,000 objects made and used by Alaskan 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, Machetantz 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, furbearers, sandpipers, passerines and rodents.

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

## Academic and Research Support

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

### 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, phonography disks, audiocassettes, videotapes and motion picture films.

The Rasmuson Library/Media Program furnishes academic and research support to University of Alaska Fairbanks faculty and staff members. 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 Alaska and Polar Regions collections include the world-class Alaska Collection, the University Archives and Manuscripts Collection, historical photographs, rare books, rare maps, and the oral history materials.

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 Information Access Services department (IAS). 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.

The Bio-Medical Library, located in the Arctic Health Research Building on the West Ridge, is a branch of the Rasmuson 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, oceanography and the environment as it relates to cold regions research.

### **Computer Network/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.

## **State and Federal Agencies**

The following is a listing of the state and federal agencies involved in research and located on the Fairbanks campus.

### **Branch of Alaskan Geology of the U.S. Geological Survey**

This branch conducts a program of geological exploration and research in Alaska. Some of the functions are geologic mapping studies and evaluation of metallic, non-metallic, coal and oil deposits; regional studies of structure and stratigraphy; detailed studies of selected type-areas; application of geology to engineering and related problems; and research in the use of new geologic methods. The Alaskan maps and geological reports are available for public use in the office.

### **Bureau of Mines, U.S. Department of the Interior**

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

The field office responds to diverse inquiries from the public and governmental agencies relating to mineral resources and environmental problems; assists in the monitoring of research projects that are conducted by the Mineral Industry Research Laboratory for the Bureau of Mines through contracts with the

University of Alaska Fairbanks and maintains liaison with local federal and state agencies in regard to efforts of mutual interest.

### **U.S. Army Cold Regions Research and Engineering Laboratories**

This office provides environmental research related to Corps of Engineers projects and other construction projects, primarily in the arctic and subarctic regions of Alaska. Past projects include the study of oil spill impact, off road vehicle impact and revegetation needs in northern Alaska.

### **College Observatory**

The College Magnetic and Seismology 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.

### **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 students.

### **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 archaeologists, 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.

### **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 basic and applied research into both human and zoonotic viral diseases.



Dr. Ray Highsmith, associate professor of marine science, works with research assistant Shelly Clay to identify a marine invertebrate. UAF photo/Sam Winch

## **FEES**

### **Tuition**

Students enrolled in undergraduate credit courses will be charged \$38 per credit for residents to a maximum of \$456; and \$114 per credit for non-residents to a maximum of \$1,368. Students enrolling in graduate credit will be charged \$75 per credit for residents to a maximum of \$675; and \$150 per credit for non-residents to a maximum of \$1,350. Maximum charge for any combination of undergraduate and graduate credits will not exceed \$675 for residents and \$1,350 for non-residents.

### **Fee Definitions**

#### **Admission Processing Fee**

A fee of \$20 shall be paid at the time an application for admission is submitted.

#### **Campus Activity Fee**

Students carrying eight or more credit hours (including both on- and off-campus) will be charged a flat \$32 per semester student activity fee. Students living in university housing will be charged the \$32 fee regardless of the number of credit hours taken. Students taking one to seven credit hours have the option of paying the fee of \$32 if desired, but they are not required to do so.

Those paying the campus activity fee are entitled to use of the Patty Center recreational facilities, and are admitted at student prices to university sponsored athletic events.

Those paying the fee are also entitled to student rates at all ASUA (student government) functions and services, including movies, dances, concerts, rentals, ombudsman, book exchange, legal advice, and intramural sports; use of Wood Center facilities; and participation in student elections. Student government represents student views and concerns with the university administration, the Board of Regents, and the Alaska State Legislature..

#### **Credit by Examination Fee**

A fee of \$15 per credit hour will be charged for each instance of credit examination.

#### **Graduate Extended Registration Fee**

Graduate students extending registration from previous semester must pay the graduate extended registration fee of \$150 or \$225.

#### **Student Health Insurance Fee**

All students who are registered for 12 or more credits, or living in any 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. Students covered by other insurance can waive university coverage by submitting a university health insurance waiver form to the registration cashier at regular scheduled fee payment times. Waiver forms can be obtained from the Center for Health and Counseling. The health insurance fee is optional only to graduate students carrying nine through 11 credits. 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 12 credits or more, or living in any university housing, must pay a \$45 health center fee. This fee is optional only to graduate students carrying nine through 11 credits. 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 graduate registration for each semester. For more information see Housing.

## Other Fees

### Textbooks

Students can expect to pay up to \$250 per semester for text books depending on the discipline.

### 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 transcripts, the fee will be \$15. All requests for transcripts must be submitted in writing. Information to be included in the request is dates and places of attendance, social security number and date of birth.

### 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 students not enrolled in one of the above music courses, on a space available basis, is \$70.

### Parking Fee

A \$75 annual fee or a \$40 semester 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.

### Records Duplication Charge

Copies of documents on file in a student's folder in the Admissions and Records Office may be obtained by that student, if time permits, upon written request at a cost of \$2 per page to a maximum charge of \$10 per request. These copies are unofficial and will bear a statement to that effect.

## 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 Alaskan 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 persons who, within one year, have declared themselves to be residents of another state, have voted in another state, or have done any act inconsistent with Alaska residence shall be deemed non-resident for purposes of non-resident tuition.

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

Persons wishing to apply for resident status should complete an Application for Residency Status form (the form may be obtained from the Office of Admissions and Records, Signers' Hall.) Applicants should 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. The completed form and the proof of residency should be returned to the Office of Admissions and Records prior to the date of registration.

Acceptable Examples of Proof of Residency are rent receipts, checks written to local merchants throughout the year, statement from an Alaskan employer, current

military I.D., Alaskan high school or college transcripts, or Postal Service verification of Alaskan address. Contact Admissions and Records for more information.

## 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.

## Financial Obligations

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

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

## Refunds

### Refund of 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 at UAF, the above charges will be refunded in full.
2. If the student formally withdraws from a course, refunds will be made according to the following schedule as determined by the date of the formal withdrawal action.
  - a. Full refund -- withdrawal prior to first day of instruction for the semester.
  - b. 90 percent refund -- withdrawal on or after the first day of instruction 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. The "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. Request 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.

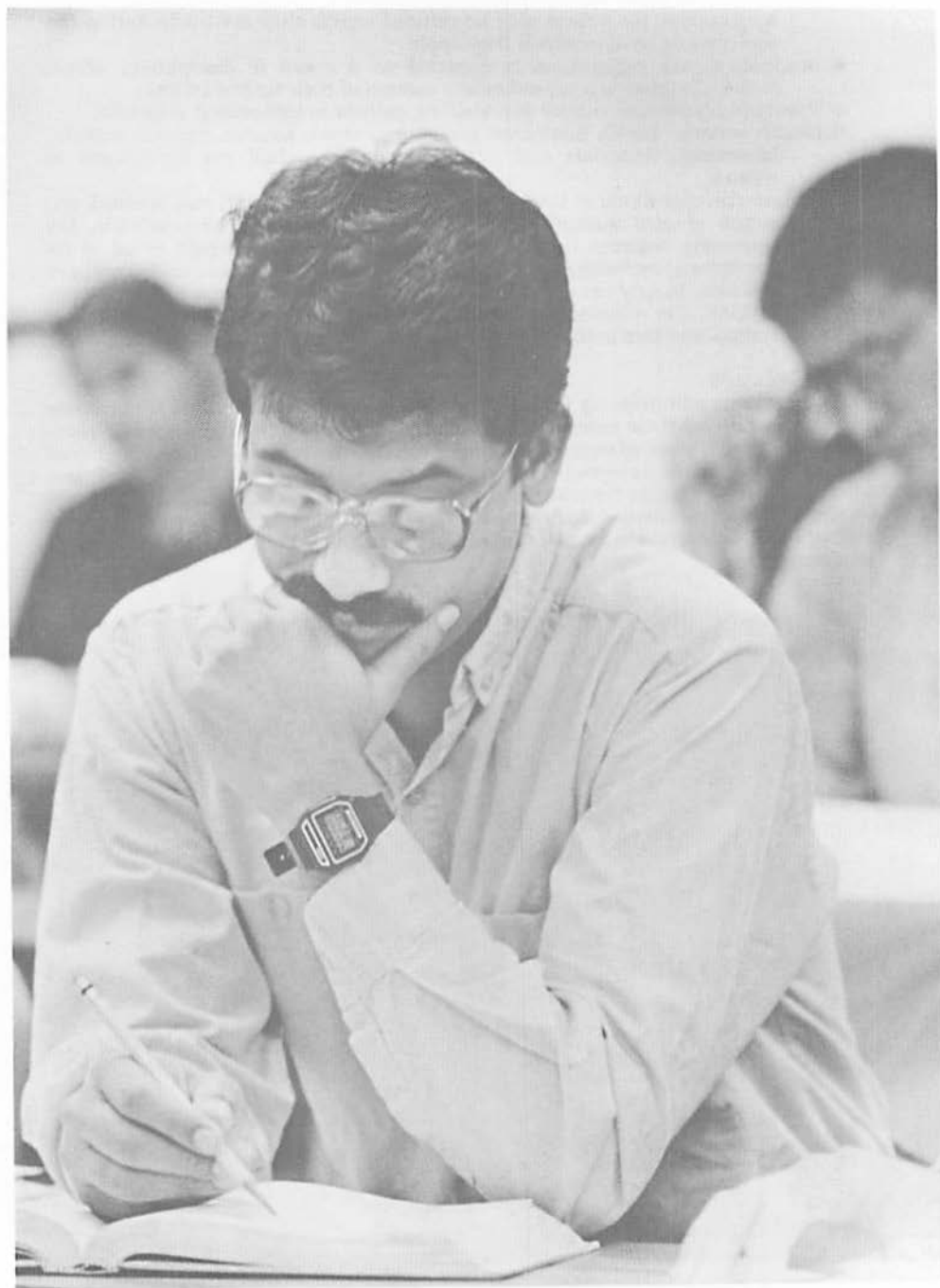
4. Students whose registration is canceled as a result of disciplinary action forfeit all rights to a refund of any portion of their tuition or fees.
5. Vocational/technical course fees shall be subject to this refund schedule.
6. Health service, health insurance premiums, music course, campus activity, 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.

### Housing Refunds

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.



Dr. Jenifer McBeath, associate professor of plant pathology, has developed hardy plant varieties that resist infection and are particularly well suited for the Alaskan climate. UAF photo/Sam Winch



Moqueet Syed, a master's degree student in the department of mining engineering, considers a problem in an engineering management class.

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

To be eligible for graduate financial aid, a student must:

1. be formally accepted as a graduate student at the University of Alaska Fairbanks,
2. be in good standing throughout the tenure of the support,
3. be registered throughout the tenure of the assistantship/fellowship/award, and
4. demonstrate satisfactory progress toward a degree.

In order to remain in good standing a graduate student must maintain a cumulative grade-point average of 3.00 in courses identified on the student's advancement to candidacy, or, if not advanced, a cumulative grade-point average of 3.00 on all courses taken since admission to graduate study.

### Continuation of Aid

To continue to receive financial aid, UAF requires aid recipients to be "in good standing" which means graduate students must maintain at least a 3.00 GPA to be eligible. The financial aid office monitors the academic progress of aid recipients. Both semester and cumulative GPA must be maintained for continuing eligibility. Students can expect to receive aid for a maximum of 36 semester credits for a masters degree. Doctoral candidates must follow the time frames determined by their departments and advisory committee.

Aid will be suspended for students who fail to complete the required credits with the minimum GPA or who exceed the maximum number of semesters or credit hours. Generally, students can regain eligibility for participation in student aid by completing 9 credits with at least a 3.00 GPA. Any student whose aid has been suspended may appeal that decision. A written appeal which states the reasons for the failure to maintain satisfactory progress standards and the steps taken to meet those standards in the future is required. Appeals should be directed to the Financial Aid Office, or to the appropriate dean in the case of graduate assistantships. A panel will review the appeal and the student will be notified of the decision.

### 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 are completed 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). This should be completed by March 1 to meet the June 1 application deadline.
3. Financial Aid Transcripts (for transfer students only).
4. Notification of applicant's acceptance by the Admissions Office (for new students only).
5. Other financial information as required for verification of need.

## Financial Aid Definitions

- Full-time student -- A graduate student enrolled for a minimum of nine UAF graduate credits during a semester.
- Graduate student -- A person who has received a bachelor's degree and is pursuing an advanced (master's or doctorate) degree.
- Half-time student -- A graduate student enrolled for at least five UAF graduate credits but less than nine UAF graduate credits during a semester.
- Without Class Standing (WCS) -- Students enrolled in classes but not formally admitted to a degree program. Students admitted WCS are not eligible for financial aid.

## Who May Apply for Financial Aid?

UAF students who anticipate being short of financial resources to meet their college expenses should apply for financial aid. The student must plan to enroll on at least a half-time basis (depending upon the type of aid being applied for) during the 1988-89 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 the degree objective. By UAF academic policy, "to be in good standing, graduate students must maintain both a cumulative and a semester GPA of 3.00 (B) or better." Students meeting satisfactory progress standards are expected to reach their degree objective within specific time/credit limits; master's degree students should earn their degree within 7 years and doctoral candidates must earn their degree within 10 years.

Federal financial aid programs (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 intending 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 three types of financial aid offered for graduate students at UAF.

1. **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. See Financial Aid Office for more details.
2. **SCHOLARSHIPS AND FELLOWSHIPS**

Scholarships and fellowships are available for graduate students through the University of Alaska Foundation, the UAF Alumni Association, the Vice-Chancellor for Research, and private organizations.

Application procedures, deadlines, and amount of awards vary. Contact the UA Foundation or UAF Financial Aid Office for information.

### 3. RESEARCH and TEACHING ASSISTANTSHIPS

Research and teaching assistantships are available to students in many graduate programs. For information regarding availability of assistantships, contact the department in which you will be working toward your degree.

## Loans

### The Guaranteed/Federally Insured Student Loan (GSL/FISL)

The Guaranteed/Federally Insured Student Loan Program enables a student to borrow directly from a bank, credit union, savings and loan association or other participating lender who is willing to make the educational loan. The loan is guaranteed by a state or private non-profit agency, or insured by the federal government. Students who are enrolled or have been accepted for enrollment at least half-time are eligible to apply.

A graduate or professional student may borrow up to \$7,500 per year, up to a total of \$54,750 for graduate or professional study, including loans made at the undergraduate level. Interest rates are approximately eight percent and an origination fee may be charged. The federal government pays the interest on the loan as long as the student remains enrolled as at least a half-time student.

The loan must be repaid. Payment normally begins 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 applications 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 certificate program or currently enrolled in good academic standing in a degree program.

### Supplemental Loans for Students (SLS)

Supplemental loans for students is a federal loan program which allows all students to borrow up to \$4,000 each year with an aggregate loan maximum of \$20,000. Other aid must be considered when determining eligibility. Payment of interest is due monthly although repayment of principal will not begin until the student leaves school.

### Parent Loan

The 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

Alaska Student Loans are restricted to applicants who have been Alaska residents for at least two years immediately prior to applying. Graduate students may borrow up to \$6,500 per year. 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

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 is four percent per annum. Loans must be repaid by December 1, 1988 for students who terminate studies at the University of Alaska at the end of the fall 1988 semester; by April 15, 1989 for students leaving at the end of the spring 1989 semester; or by July 15, 1989 for students who will be returning to UAF for the fall 1989 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

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.

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

## Scholarships and Fellowships

Various scholarships and awards are available to UAF graduate students.

*Glenn Carrington Scholarship* of \$1000 is awarded to a native student or a business major.

*Civil Engineering Scholarship* of \$1000 is awarded annually preferably to a student in military science and/or an Alaska high school graduate.

*Frank Moolin Engineering and Science Management Fund* awards are given to graduate students in the engineering and science management program.

*Albert A. Zucchini Scholarship* of \$1000 is awarded to an Alaskan married student studying mining and geological engineering.

*Earl H. Beistline Scholarship* of \$1000 is awarded to a student in the School of Mineral Engineering.

*Kathryn S. Patty Scholarship* of \$1000 is awarded to a female student in mineral engineering.

*John Marooney Memorial Scholarship* of \$700 is awarded to a student in wildlife management by nomination of the faculty.

*Ruth Croxton Memorial Fund* awards are given to students studying environmental relationships in Alaska.

*Elvey Memorial Award* of \$500 is given to students in the sciences.

*Jack R. Lutck Memorial Travel Fund* awards are given to students in environmental physiology.

*Alaska Native Student Fund* awards are given to Alaska Native Students annually.

*Alexandra Krauss Memorial Scholarship* of \$500 is awarded to a woman.

*Graduate Resource Fellowship* of \$6,500 to \$10,000 is awarded to students working on Alaskan resource problems.

*Pioneers of Alaska Igloo # 4 Award* is given to a student born in Alaska and son or daughter of a Pioneer.

*Lowell Thomas, Jr. Scholarship* is awarded to a student studying natural resources.

*Angus Gavrn Memorial Migratory Bird Research Fund Award* of \$25,000 is given to students or faculty doing research on migratory bird species.

For further information and forms contact:

UNIVERSITY OF ALASKA FOUNDATION  
910 YUKON DRIVE  
FAIRBANKS, AK 99775  
PHONE: (907) 474-7687

## Research and Teaching Assistantships

To be eligible for graduate assistantships a student must be formally accepted as a graduate student at the University of Alaska Fairbanks, be in good academic standing throughout the tenure of the support, be registered throughout the tenure of the assistantship/fellowship/award, and demonstrate satisfactory progress toward a degree.

The University annually awards teaching/research assistantships to qualified graduate students. For information and applications, students should contact the head of the department in which they are enrolled.

### Assistantship Stipends

Stipends for graduate assistantships are generally paid for the school year at rates of \$10.00-\$12.00 per hour for 20 hours per week. Assistantships are sometimes available during the summer for 20-40 hours per week.

Teaching and research assistants are entitled to out-of-state tuition waivers for those students who are classified as non-residents of the State of Alaska. Students must present a copy of their Letter of Appointment to the fees assessors during registration each semester to receive the non-resident tuition waiver.

A graduate student with a GPA less than 3.0 for one semester will be allowed to petition to continue as a graduate assistant. A maximum one semester exception will be allowed per student. The petition by the student must be

approved by the student's advisory committee chair, the department head, and dean.

### Work and Study Loads

A full-time graduate student is defined as one who is enrolled for nine or more semester hours of credit, but the average full-time study load for a graduate student who is not working is 12 credits per semester.

The final decision on the work and study load relationship rests with the student's advisory committee and dean.



"Student greeting," a sculpture by Karen Olanna, is located near the center of campus. UAF photo/Mary Ann Borchert



---

## HOUSING INFORMATION

### In General

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

### Housing Deadlines

The University of Alaska Fairbanks is experiencing an increased demand for 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. The UAF currently has a substantial waiting list for married student housing. Contact the Housing Office for more information on the availability of married student housing.

### Eligibility

Students must maintain full-time status (nine credits for graduate students) to qualify for student housing. Extended registration on campus is also considered full-time registration for purposes of housing allocation. See Extended Registration policy for limitations. Students should consult the housing staff about regulations concerning maximum terms of occupancy for each degree level.

### Rooms

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

### Room Assignment

Hall reservations are made on a first-come, first-served basis provided application and deposit requirements have been completed. Graduate students are given preference over other students in single room assignment. Specific room assignments will be given to students upon their 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 resident 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

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 of Regents 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 (1958)** 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 1921-1932.

**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 is named for a long-time professor of anthropology at the university.

**TERRIS MOORE HALL (1964)** houses 136 female and 182 male students in double and single rooms on eight floors. Moore Hall is named for the second president of the University of Alaska.

**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 and one four-bedroom apartments, 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: \$520 per person in double rooms, and \$640 for single rooms. Room fees quoted are per semester and are subject to change. Room rental permits the use of all lounge, recreation, storage and laundry areas, and local telephone privileges.

### Room Deposit

The completed application for housing, with a \$50 reservation/damage deposit, must be returned to the Housing Office, University of Alaska Fairbanks, Fairbanks, Alaska 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 fall semester are automatically renewed for spring semester on Dec. 1 unless the Housing Office receives a notice of intent to vacate.

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

## Meal Ticket

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

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

Students who do not live in University resident 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. Rentals range from \$250 (efficiency to \$590 (3 bedroom) per month including utilities. Furnished and unfurnished apartments are available.

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, unless they are accepted for housing at Yak Estates or Garden Apartments. 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 family housing 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 (1965)** contains 12 units for married students without children. 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.

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

## Applications and Eligibility for Student Family Housing

Applications for student family housing are mailed to students with notification of acceptance to graduate study from the Office of Admissions and Records. 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 \$25 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 DRIVE, BARTLETT HALL  
UNIVERSITY OF ALASKA FAIRBANKS,  
FAIRBANKS, ALASKA 99775-0880

---

## 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, the University of Alaska Fairbanks continues to encourage individualization in the educational process.

Student services include: (a) orientation activities to assist new students in adjusting to the privileges and responsibilities of membership in the university community; (b) academic counseling and vocational testing; (c) counseling with students relative to their personal problems; (d) financial assistance by means of scholarships, loans, and part-time jobs; (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 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 for Disabled Students, Center for Health and Counseling, University of Alaska Fairbanks, Fairbanks, Alaska 99775-0440, (907) 474-7043 or 504 Coordinator, 101 Etelson Building, University of Alaska Fairbanks, Fairbanks, Alaska 99775-5320, (907) 474-7919.

### 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 Office of the Dean of Students.

Most students find it relatively easy to adjust to the privileges and responsibilities of campus citizenship. For those who find this process more difficult, the university attempts to provide counseling to help the student gain insight and confidence in adjusting to the new environment. In some cases, when a student is unable or unwilling to assume social responsibilities as a citizen in the university community, the institution may terminate enrollment, or take whatever action is deemed necessary and appropriate.

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

### Additional Academic Opportunities

#### Summer Sessions

A wide variety of academic and non-academic programs are offered to residents and visitors during the summer. Summer classes are open to candidates for graduate or undergraduate degrees and to unclassified students wishing to take special courses without reference to degree objectives. Numerous courses and workshops are available throughout the summer. Students may choose from teacher-oriented course work, cross-cultural education, arctic-oriented studies,

computer workshops, and field experiences in areas such as anthropology, biology, fisheries, geology, 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:  
DIRECTOR, SUMMER SESSIONS  
SIGNERS' HALL  
UNIVERSITY OF ALASKA FAIRBANKS,  
FAIRBANKS, ALASKA 99775-1540  
PHONE: (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 listings are received at ATP, they are referred to registrants who meet the school districts endorsement requirements. 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 Services

The UAF Office of Alumni Relations is located on the ground floor of Constitution Hall. The University of Alaska Fairbanks 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

University trails are available for cross-country running and skiing, including a lighted ski trail.

In the intramural sports program, men and women students from the different living groups (faculty and staff, too) 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. UAF sponsors men's ice hockey at the NCAA Division I level. Students may try out for these teams by contacting the appropriate coach.

### Campus Center

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 its 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 foosball, pocket and carom billiards, snooker, table tennis, video games and bowling lanes. The area is regularly used for tournaments, classes, and open play. The Pub, which serves beer, wine and non-alcoholic beverages, is also located in Wood Center. The Pub provides a wide variety of entertainment for the university community.

### **Career Planning and Placement**

The Career Planning and Placement office 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 advisors, 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 advertise 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.

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.

Counseling is a process that allows individuals to explore their own personal feelings, doubts and problems without being judged, evaluated or pressured. The counseling staff believes 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.

### **International Student Advising**

The International Student Advisor 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 International Student Advisor 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

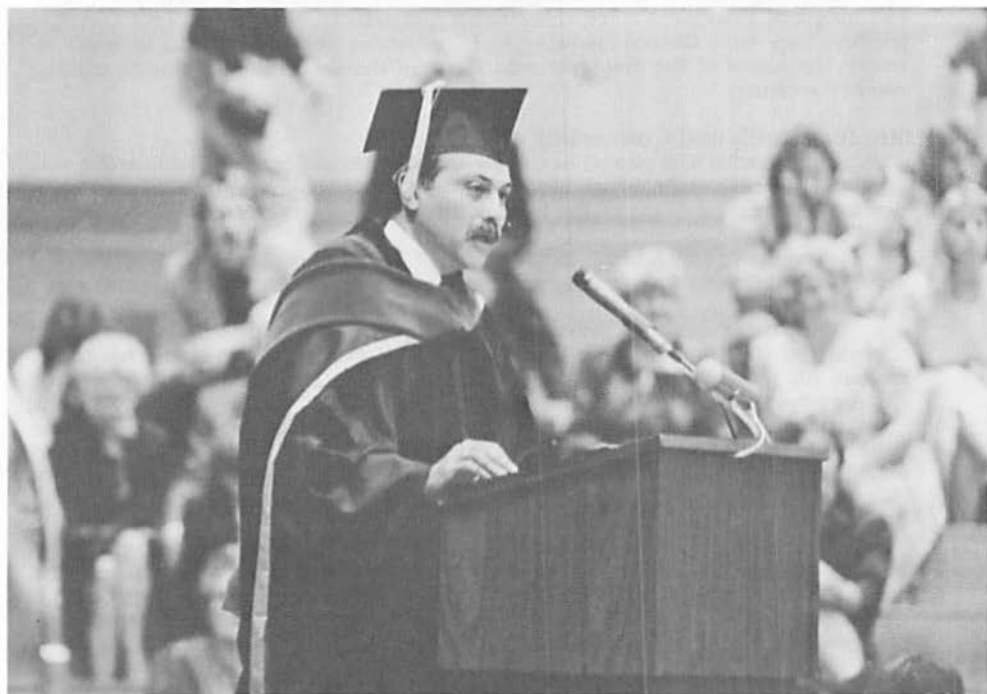
Special summer institutes are often funded by federal and state agencies and private foundations. Summer institutes in the teaching of languages, counseling, guidance, English, science and mathematics have been held.

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

### 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 female students, resources and activities are also open to female 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.



Dr. Luis Proenza, vice chancellor for research and dean of the graduate school, addresses the graduating class of 1988 at May commencement. UAF photo/Sam Winch



# ACADEMIC REGULATIONS

## Student Responsibilities

It is each graduate student's responsibility to be informed of and to comply with all regulations and requirements for admission to graduate study. The completion of all graduate degree requirements is also the responsibility of the student. Therefore, it is essential that the student become familiar with the policies and regulations presented in this Catalog.

### Requirements for Good Standing

In order to remain in good standing a student must maintain a cumulative grade-point average of 3.00 in courses identified on the student's Advancement to Candidacy, or, if not yet advanced, a cumulative grade-point average GPA of 3.00 on all approved courses taken since admission to graduate study.

### 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 work of others as their own. Students will attribute the source of information not original with themselves (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 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.

### 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 may 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.

### Drop/Add

Students are expected to compete the courses in which they enroll in. Students may, however, withdraw from a course until 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.

### 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 initiating the withdrawal will immediately notify the course instructors of the withdrawal.

Withdrawals after the second week, regardless of 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 student or faculty regarding the dean's decision is the Vice Chancellor for Academic Affairs, the Chancellor and then the Fairbanks Grievance Council.

### 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 grade 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.

### Grade Point Average (GPA) Computation/Grading System

For the computation of a GPA, the number of UAF credits attempted for each semester is divided into the number of grade points earned, the credits attempted 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.

All grades (original and retakes) for a course completed at UAF will be shown on the permanent record. For scholastic standing calculations for graduate students, the GPA includes all courses identified on the students advancement to candidacy (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 otherwise 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 (including +/-)** 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 (including +/-)** Indicates outstanding ability above the average level of performance (three grade points per credit).
- C (including +/-)** Indicates a satisfactory or average level of performance (two grade points per credit).
- D (including +/-)** The lowest passing grade, indicates work of below average quality and performance (one grade point per credit).
- F (including +/-)** 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 be applied toward meeting degree requirements and may be used as a measure of satisfactory progress. Satisfactory performance is the equivalent of a grade of "B" or better in graduate courses.
- S Satisfactory** - Used only to indicate satisfactory final completion of graduate thesis.
- 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

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".

### **Minimal Acceptable Grades**

For those courses specified on the student's Advancement to Candidacy, a grade of "C" will be accepted in graduate-level courses (600-level courses), provided the student maintains a "B" average for all graduate courses. A grade of "A" or "B" ("P" is unacceptable) must be earned in upper division course work (300-400 level) specified in the Advancement to Candidacy. A student will be placed on probation if the GPA falls below 3.00, and will remain on probation until grades are brought up to 3.00.

UAF will report to the VA any veteran receiving VA educational benefits who is not maintaining a semester or cumulative GPA of 3.00 or above 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.

### **Disqualification from Graduate Study**

Upon the recommendation of either the dean of the college or school or the student's advisory committee (and with the concurrence of the dean), a student may be disqualified from graduate study when the student's performance is deemed unsatisfactory. The dean will send the student a letter informing the student of the disqualification, the reasons for the action, and the conditions under which the student may be readmitted, if readmission is possible. A copy of this action will be sent to the Office of the Graduate School which will then forward it to the Office of Admissions and Records.

### **Time Limits for Completion of Degrees**

All work, including transfer credits from other institutions, used to fulfill degree requirements for the master's and educational specialist degrees must be completed within seven years. For the doctor's degree, the time limit is 10 years. Requests for exception to this policy should be submitted to the Office of the Graduate School at least one semester prior to the anticipated date of graduation and must have the approval of the graduate advisory committee, department head, and dean.

## **Graduate Advisory committee**

A graduate advisory committee is normally appointed within the first semester of study to provide guidance to students in developing and completing their degree programs. Committee members for graduate degrees are appointed by the appropriate dean, usually upon recommendation of the department head; Ph.D. committee members are also approved by the Dean of the Graduate School.

### **Committee Composition**

The advisory committees of the master's and educational specialist degree students consist of at least three faculty members, one or more of whom may be from outside the student's major, department, program, or school. The doctoral advisory committee consists of at least five faculty members, one of whom must be from outside the department. A minimum of three committee members for the

master's degrees and the educational specialist degree and five for the doctoral degree shall be faculty whose primary employment is with the University of Alaska. This does not exclude cooperative unit members associated with the different colleges and schools. Adjunct or affiliate professors may be used to supplement these basic committees, and persons without University of Alaska appointments may serve as guest committee members. Any exceptions to the composition of graduate advisory committees must be explicitly approved in writing by the Office of the Graduate School.

### **Committee Responsibility**

The major responsibilities of the Graduate Advisory Committee are as follows: to formulate, in consultation with the student, a Graduate Study Plan; to develop a tentative timetable for completion of all requirements for the degree program; to monitor the student's work, both in course work and research, and to provide advice and feedback to the student on that progress as well as file an annual progress report with the Office of the Graduate School; to approve, where appropriate, a research topic; to supervise the preparation of the thesis when one is required; to uphold the standards of the college/school and the University; to inform the dean, in writing, if a student's performance is inadequate and provide relevant advisory committee recommendations; and to formulate and conduct the comprehensive examinations and other exams required by the department. The student's advisor (major professor, advisory committee chair) acts as head of the graduate advisory committee.

### **Majors**

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

A student admitted to an interdisciplinary degree has had accepted a proposed project. Significant project (and committee) changes will require re-application, if so recommended by the advisory committee.

### **Graduate Study Plan**

The Graduate Study Plan (GSP) outlines the curriculum of study and a timetable to be followed by the graduate student in meeting graduate degree requirements. It serves as a road map for graduate study and should be completed in draft form early in the program. The GSP is prepared by the advisory committee in consultation with the student, and it serves as a working agreement between the student and the faculty of mutual expectations. Preparation of the GSP should begin during the student's first months at the University, and a working draft should be completed prior to the completion of the student's first full-time equivalent of two semesters at the University. Copies of the working document, as well as subsequent revisions, shall be made available to the student and to each member of the advisory committee, and a copy should be filed in the office of the appropriate department and with the Office of the Graduate School.

The GSP not only contains the specific degree requirements, but indicates the mechanism for fulfilling these requirements (e.g., via course work, examinations, readings, internships or other supervised experience, etc.) and a projected timetable for completing the various requirements. Depending upon the length of the student's degree program, in some cases the first draft of the GSP may also be the final one; but

for the longer programs, the final GSP will evolve over several semesters, with additions and revisions being made as the student progresses. The final GSP is the basis for preparation of the application for Advancement to Candidacy.

## Advancement to Candidacy

The finalized Graduate Study Plan should be used as a basis for completing this form. Please refer to the sections on "Requirements for Good Standing" and "Minimal Acceptable Grades" when selecting courses to be included on the Advancement to Candidacy application.

Admission to graduate study does not imply "Advancement to Candidacy" for a degree. The student's graduate advisory committee has the option of refusing to recommend a student for candidacy.

## Master's Degree

Master's degree students may apply for advancement to candidacy for a specific master's degree if they are in good standing and have satisfied the following requirements: 1) satisfactorily completed at least nine semester credits of graduate study in residence at the University of Alaska Fairbanks (i.e., study after admission to a specific degree program), 2) received approval of a provisional thesis title, if a thesis is required, and 3) received approval of the finalized Graduate Study Plan.

Advancement to Candidacy formally establishes a student's specific degree requirements, and, thus, it is in the interest of both the student and the student's advisory committee that the student applies for candidacy as soon as possible after qualifying. At the latest, application for advancement to candidacy must be submitted one semester prior to awarding of the degree. For those students completing their programs primarily during the summer sessions, applications for advancement to candidacy must be submitted the summer session prior to awarding of the degree.

## Doctor of Philosophy

A Ph.D. student may apply for candidacy for the Doctor of Philosophy degree after having accomplished the following: 1) completed the full-time equivalent of two academic years of graduate study, 2) completed at least one semester in residence at the University of Alaska Fairbanks, 3) received approval of the finalized Graduate Study Plan, 4) completed the language and/or research tool requirement, 5) obtained approval of the advisory committee for the title and synopsis of the thesis, and 6) passed a written comprehensive examination. A Ph.D. student must apply for advancement to candidacy no later than one year prior to the anticipated date of the awarding of the degree.

## Examinations

Examinations are given in both written and oral form, depending upon the policy of the program unit, the decision of the advisory committee, and the specific examination being taken.

### Placement Examination

Some programs have a formalized placement evaluation procedure designed to pinpoint strengths and weaknesses in the student's background as an aid in developing the student's Graduate Study Plan. This evaluation is carried out during the student's first semester at the University, preferably in the first month, and may be written, oral, or both.

### Qualifying Examinations

A few master's degree programs require the successful completion of a written and/or oral qualifying examination before a student may be advanced to candidacy. This examination is an interim evaluation of the student's academic

progress, and the student may pass unconditionally or conditionally. A conditional pass indicates specific weaknesses in the student's background that must be remedied before degree requirements are completed. The Graduate Study Plan and, later, the Advancement to Candidacy form should include mechanisms for remedying these weaknesses.

### **Comprehensive (Final) Examination**

Each student must pass a comprehensive examination. The comprehensive will examine students' mastery of their major and related fields. The primary purpose of the comprehensive examination, and the thrust of the questions, should be to determine whether the student has an integrated knowledge and understanding of the principles and concepts underlying the major and related fields. Wherever possible, comprehensive examinations should be tailored to the individual student. Well in advance of the examination, preferably at least three months, students should be informed as to the format and general areas of questioning they may expect.

For master's and educational specialist degrees, students usually take this examination during their final year; it may be either oral or written or a combination of both. For the Ph.D. degree, students take a written comprehensive examination within two years of entering the program, but no later than two academic years before the expected completion of the degree (whichever is earliest) and it is a prerequisite for advancement to candidacy. At the discretion of the doctoral student's advisory committee, an oral examination may supplement a written comprehensive examination.

The Ph.D. comprehensive examination is a department-based examination. Some programs hold regularly scheduled Ph.D. comprehensive examinations and have established examination procedures. Programs that do not hold regularly scheduled Ph.D. comprehensive examinations must augment the graduate student's regular advisory committee with two department faculty who are not members of the student's advisory committee, and who shall be appointed by the department head for the examination. All members of the augmented committee will be voting members. Examination questions will be sought from all faculty in the program with expertise in the appropriate areas. The augmented committee will select questions from those submitted for the examination.

### **Defense of Thesis Examination**

Each student who is required to complete a thesis in partial fulfillment of degree requirements must pass an oral defense of thesis examination. The defense will consist of a presentation by the candidate, the length of which will be predetermined by the advisory committee, followed by questions on the research, analysis, and written presentation. An outside examiner will be assigned by the Office of the Graduate School to attend the thesis defense. The presentation of research by the student may be a public seminar, with the questioning period closed to the public. A thesis will not be accepted unless it can be successfully defended by the candidate.

In non-thesis master's programs, a defense of the research project is required in the same manner.

### **Examination Committee**

In most instances, examinations are prepared and administered by the student's graduate advisory committee under guidelines formulated by the faculty of the program unit in which the degree is being taken. In a few programs, examinations are replaced or supplemented by departmental or school examinations and administered by an established examining committee and the chair of the student's advisory committee.

For the purpose of examination, the advisory committee may be supplemented with additional faculty members at the discretion of the dean, or Office of the Graduate School.

Should it be necessary for a committee member to be absent from an examination, a memorandum to the dean should be prepared by the chair of the

committee requesting that a substitute be appointed, if appropriate, or summarizing the absent member's pre- or post-exam participation. A copy of this approved request should be submitted with the Report of Examination.

### Outside Examiner

The presence of an "outside examiner," representing the Office of the Graduate School, is required at all oral examinations (except the Placement Examination). The outside examiner is appointed by the Office of the Graduate School and must be from a different department than the candidate and chair of the advisory committee. The function of the outside examiner is to determine that a stringent, unbiased examination is given and that it is fairly administered and evaluated.

It is the student's responsibility to request that an outside examiner be appointed to serve at all oral examinations. The student should notify the Office of the Graduate School at least two weeks prior to an oral comprehensive examination, project defense or thesis defense. The Office of the Graduate School will advise the student of the faculty member appointed to serve at the student's examination, and in the case of a defense of thesis or project, the student will supply the examiner with a copy of the thesis (project) at least seven days prior to the examination.

The examiner will complete the Report of Outside Examiner form and submit it to the Office of the Graduate School stating any adverse concerns resulting from attendance at the examination or review of the thesis (project).

An outside examiner is not necessary for written examinations. Instead, copies of all written exams, questions, and evaluated responses should be retained in department/school files for at least one year after the degree has been awarded.

### Report on Examination

After the completion of each examination, a form which reports the results of the examination must be completed by the student's committee (if it was an oral exam, signature of the outside examiner is required) and submitted to the Office of the Graduate School.

## Language/Research Tool Requirement

Proficiency in a language or a research tool is required of students in some master's degree programs and in all Ph.D. degree programs. For the master's degree, the requirement may be specified by the program offering the degree or by the student's advisory committee, if its requirements exceed those of the program.

The specific language/research tool is determined by the student's advisory committee, guided by policies of the administrative unit in which the degree is offered and by discussions with the student. Competency in a foreign language is required, however computer languages, statistics, mathematics, etc., or a study in such areas as history or philosophy of science, business administration, law, economics, etc., may be substituted by the committee upon the approval of the Dean of the Graduate School. In all instances, however, topics selected are intended to be supplementary to and must be supportive of the student's degree program. This language/research tool requirement should be viewed as a breadth requirement. Remedial courses and basic or introductory courses or skills in subjects in which the student would normally be expected to have proficiency as part of the degree program may not be used in meeting this requirement. Consult the Graduate Office if questions arise.

Determination of the student's proficiency in meeting the requirement is the responsibility of the advisory committee. When foreign languages are required, committees are encouraged to seek evaluation assistance from the Department of Linguistics and Foreign Languages. If the Educational Testing Service Foreign Language Exam is used, the expense is borne by the student. Minimum scores



required on this examination are 60% for doctoral candidates and 40% for master's candidates, although some programs may require higher scores.

The University assumes no responsibility to students in preparing for language/research tool examinations -- the responsibility is the student's alone. To aid in this preparation, however, a student may enroll in a regular course, registering for regular credit with grades, credit/no credit, or as an auditor. Occasionally, the Department of Linguistics and Foreign Languages may offer a special foreign language course designed to assist students in their preparation. Credits used to satisfy the language/ research tool requirement may not be used to meet the minimum number of credits required for the student's degree and should not be included in the courses listed on the advancement to candidacy form.

Completion of the language/research tool requirement should be reported to the Office of the Graduate School on the form, "Report on Completion of Language/Research Tool Requirement."

## Submission of Theses

Guidelines for the preparation of a master's or Ph.D. thesis are available in each department and the Office of the Graduate School.

### General Policy

A thesis is required in some master's degree programs, as indicated by specific degree program requirements. A thesis is required of every candidate for the Ph.D. degree and is expected to represent the equivalent of at least one academic year's work at the University of Alaska. The doctoral thesis must demonstrate the student's ability to perform independent research in the student's major field and must be a substantial contribution to knowledge, the substance of which will be publishable in a professional journal.

Theses prepared in partial fulfillment of graduate degree requirements must be individually authored; co-authorship is not acceptable.

Since theses receive public distribution, writers are cautioned that they will be held fully responsible for their use of any copyrighted materials in their manuscripts. Accordingly, all candidates for degrees are hereby reminded that they must obtain written permission for the use of any copyrighted material.

All records of work done and all specimens collected in connection with the preparation of these manuscripts are the property of the University or the agency financing the work. That material which is the property of the University can be released with the permission of the dean after it has been reproduced by the University; all collected specimens must be deposited with the University of Alaska Museum.

The University has no overall policy to restrict publication; students should be aware, however, that individual programs or sponsoring organizations may have such a policy. Since publication may be defined as "public distribution of copies or reproductions," students desiring to withhold their theses from public domain should secure copyrights. Before applying for a copyright, however, students should ascertain any restriction imposed by funding sources.

### Deadlines

Students must check with their program or department head to ascertain deadlines for preliminary thesis review. Some directors and heads of departments may require that they be allowed to review a final draft of the thesis prior to the Defense of Thesis Examination.

Four weeks before the end of the semester, the student must have 1) passed the Defense of Thesis Examination, 2) filed the signed form certifying the passage of this examination with the Office of the Graduate School, and 3) submitted the thesis in final form to the Office of the Graduate School. The exact dates for these deadlines are found in the Graduate Manual.

### Approval Process

Once the thesis has been successfully defended and the final copy prepared, it must be circulated by the student for approval at all appropriate levels. All members of the graduate advisory committee and the committee chair should be asked to sign first. If a member of the committee is out of town and will not return in time to meet the submission deadlines, the chair must prepare a cover letter explaining the situation and verifying that the committee member has reviewed final drafts and/or was present at the defense examination. The thesis may then be forwarded for further approval, and the committee member may review and sign upon returning.

### Submission and binding Fee

Two copies on thesis paper must be submitted to the Office of the Graduate School. One becomes part of the Rasmuson Library Archives and is not available for use outside the library; the other is cataloged for general circulation. An additional copy may be required for the student's department library.

The candidate must pay the library binding fee at the Business Office, and the receipt for the binding fee should be submitted with the thesis to the Office of the Graduate School. If additional copies are to be bound for the student, departments, etc. these additional copies and their accompanying receipts (or University journal voucher) for binding must also be delivered to the Office of the Graduate School at the time of submittal. If pockets are needed for maps or charts there is an additional fee which needs to be paid at the Business Office and included on the receipt for binding.

### Copyright

Before applying for a copyright for a thesis, the student should check with the committee chair to ascertain whether any funding source used for the research precludes the right to file for and hold an individual copyright. Students who wish to retain the exclusive right to reproduce, display, adapt, publish, or perform all or any part of their work, and provided they are not otherwise precluded from doing so by prior contractual agreements, may apply for copyright.

Students may apply directly to the U.S. Copyright Office, or they may authorize University Microfilms International to apply for a copyright for them. In either case, if copyright is intended, the following notice must appear on the title page of the thesis:

(C) Copyright (year) (name of author)

For further information and forms regarding copyright, please contact the Office of the Graduate School.

### Microfilming

The University of Alaska Fairbanks participates in the Doctoral Dissertation Program of University Microfilms International (UMI), which requires that a copy of all Ph.D. theses be sent by the University of Alaska Fairbanks to UMI in Ann Arbor, Michigan, for microfilming. The Ph.D. candidate is required to pay the fee to cover the cost of microfilming the complete thesis, the final dissemination of the material, and the cost of producing and forwarding one positive microfilm copy of the thesis to the Library of Congress. The fee also includes publication of the abstract of the thesis in UMI's monthly listing of Ph.D. theses.

The fee for these services should be paid at the UAF Business Office by check (made payable to UAF) or by journal voucher. The receipt for microfilming must be submitted with the thesis to the Office of the Graduate School.

Master's degree candidates have the option of whether or not to have their theses sent to UMI for microfilming and their abstracts included in Master's

**Abstracts.** If this service is desired, payment must be made at the same time and in the manner described above.

Publication by microfilm does not preclude subsequent publication of the thesis in whole or in part by the author.

At the student's request and on the recommendation of the advisory committee, the Office of the Graduate School will delay publication by microfilm for one year in order to protect patent or other rights. A request for such a delay should be made in a letter or memorandum to the Dean of the Graduate School and should indicate the length of time the thesis is to be restricted and the person who may authorize its release.

### **Abstract for Publication**

At the time the thesis is submitted to the Office of the Graduate School, Ph.D. candidates must also submit two final copies of an abstract of their work for publication in Dissertation Abstracts International. The abstract must be approved by the student's advisory committee. The fee for microfilming will include cost of publishing the abstract in this volume.

The abstract submitted for publication in Dissertation Abstracts International may be the same as the Abstract used in the preliminary pages of the thesis, however an additional heading is required for the two copies submitted to University Microfilms International.

For more details on the preparation of theses see the Graduate Manual.

## **Registration Regulations**

A graduate student must be registered for a minimum of three graduate credits each semester while actively working toward a degree. A student failing to either register or obtain a leave of absence will be dropped from graduate study and will be required to reapply for admission and be readmitted before resuming graduate study.

Students must be registered in the semester in which they graduate. However, students who have been continuously registered and have completed all degree requirements, including final thesis approval and the removal of all incomplete and deferred grades, within the first four weeks of the semester in which they intend to receive the degree, need not register for that semester. However, an application for graduation must be submitted to the Office of Admissions and Records before the deadline for that semester (See the Graduate Manual).

### **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 rather than register for course credits during that semester. A student on extended registration 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 (\$150 fee per semester); and 2) On Campus - for students needing to use facilities and faculty advisement (\$225 fee per semester). Students on extended registration in residence who are considered full-time by their department and the Graduate School Office pay full-time student activity fees and medical insurance fees, and may receive certification of full-time status for deferment of student loans.

## **Change of Major**

If a student's intended degree or intended area of emphasis changes during the course of study, a formal change of major form must be completed. The change of major form may only be used when the areas of emphasis or the degrees offered are

within the same program. A student who wishes to change to a different program in another department, school, or college must submit a new application for admission so that the credentials may be fully reviewed by the faculty responsible for that degree program.

## Requests for Exceptions

A student may request an exception to a degree requirement, policy, procedure, deadline, etc. Such requests should be prepared by the student, in memorandum format, with adequate explanation of the extenuating or unusual circumstances warranting the request. The request must be approved by the student's advisory committee, department head, and dean and must be submitted to the Office of the Graduate School. The Office of the Graduate School will notify the student and the advisory committee of the action taken on each request.

## 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 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 May commencement ceremony which follows the spring semester.

## DEPARTMENTS AND CURRICULA

### 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 an increasing emphasis on Alaskan studies, especially those related to public policy issues. A major goal of the College of Liberal Arts 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.

**Graduate Degrees** -- Master of Arts in anthropology, English and music, Master of Arts in Teaching in English, history, mathematics and music. Master of Fine Arts in creative writing. Master of Science in computer science and mathematics. Doctor of philosophy in anthropology and mathematics.

### Anthropology

**Degrees:** M.A., Ph.D.

**Minimum Requirements for Degree:** M.A.--30 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 human beings to the various environments. Archaeological and human ecological research carried out in the field and library provides information about past and present modes of living and of origins and distribution of peoples and cultures in the Arctic and subarctic.

#### *Faculty*

*Head, Department of Anthropology and Professor:* Richard H. Jordan

*Professors:* Jean S. Aigner, Lydia T. Black, G. Richard Scott, Anne D. Shinkwin

*Associate Professor:* Linda J. Ellana, W. Roger Powers

*Assistant Professor:* Charlotte Basham, Ann Frentzen, Patricia Kwachka, Phyllis Morrow

#### 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. Field research in Alaska is a common experience for graduate students in Anthropology.

The program offers two options -- a thesis track and a non-thesis track. The choice of option is guided by the student's interests and goals, the graduate advisory committee and the requirements of the university.

**Degree Requirements:**

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 must be composed of at least three UAF faculty members. At least two of the committee members must be from the department (in the subfield of student interest, if available). 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 advisory committee and the student.
- 5a. Required courses for all graduate students enrolled in the program:

Courses . . . . .	Credits
Anth. 601--Proseminar in Social/Cultural Anthropology . . . . .	3
Anth. 611--Proseminar in Archeology . . . . .	3
Anth. 621--Proseminar in Physical Anthropology . . . . .	3

5b. 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 course work (not research or thesis) and 21 of these must be at the 600 level, plus 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 course work (including the core requirements), with 24 of these at the 600 level. A maximum of 6 hours may be devoted to research (Anth. 698). The student must complete a research paper in a 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.

**Anthropology -- Ph.D. Degree**

A Ph.D program in Anthropology is expected Fall 1988. Currently students may develop an interdisciplinary Ph.D. with an emphasis in several areas of anthropology: Alaskan archaeology; Quaternary studies; contemporary Alaskan 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.

**Computer Science**

**Degrees: M.S.**

**Minimum Requirements for degree: M.S.--30 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.

The M.S. degree follows the recommendations of the Association for Computing Machinery (ACM) and the Institute for Electrical and Electronic Engineers (IEEE).

The intent of the M.S. degree in computer science is to provide breadth and depth in course work 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 universities 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, Barbara M. Lando

*Associate Professors:* Peter Knoke, Mitchell Roth

*Assistant Professors:* Dusan Jevtic, Ming JIang

## **Computer Science -- M.S. Degree**

### **Degree Requirements:**

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

Courses . . . . .	.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 System 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

No 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.

## **English**

**Degrees:** M.A., M.A.T., M.F.A..

**Minimum Requirements for Degrees:** M.A.--30 credits; M.F.A.--45 credits; M.A.T.--36 credits

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 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 the degree programs require students to take 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; Master of Fine Arts candidates write original creative works as theses. After being admitted to one of the degree programs, a graduate student may apply for one of the department's teaching assistantships.

### **Faculty**

*Acting Department Head and Professor:* John W. Morgan

*Professors:* John W. Bernet, Alice L. Harris, David A. Stark

*Associate Professors:* Roy K. Bird, Joseph A. Dupras, Marie Lium, Michael J.

Schuldiner, Russell E. Stratton, Russell D. Tabbert, Cynthia L. Walker

*Assistant Professors:* Eric Heyne, Janis Lull, John Murray (visiting), Leroy Perkins,

James Ruppert, Peggy Shumaker, Frank Soos.

*Instructor:* Doris Ann Bartlett

### English -- M.A. Degree

**Degree Requirements:**

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:

Courses . . . . .	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. Students may advance to candidacy when their advisory committee deems that they have made satisfactory progress toward completion of their degree.
4. Pass a written comprehensive examination based on a standardized reading list; the examination is to be taken no later than the student's third semester of work. The examination will be held on the Saturday ending the fourth full week of classes.
5. Pass an oral defense of the thesis.

### English -- M.F.A. Degree (Creative Writing)

**Degree Requirements:**

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--Writer's 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 courses . . . . .	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. Students may advance to candidacy when their advisory committee deems that they have 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. Examination will be held on the Saturday ending the fourth full week of classes.
5. Pass an oral defense of the thesis.

## History

**Degrees: M.A.T.**

**Minimum Requirements for Degrees: M.A.T.--36 credits**



The history department seeks to make the student aware of the cultural heritage of humankind, the great problems that have been faced throughout history and how we have 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*

*Head, Department of History and Professor:* Claus-M. Naske

*Professor:* John Whitehead

*Associate Professor:* Peter Cornwall, Carol Gold, Richard Pierce

*Assistant Professor:* Terrence Cole

### 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.

## Mathematics

**Degrees:** M.A.T., M.S., Ph.D.

**Minimum Requirements for Degrees:** M.A.T.--36 credits; M.S.--30-35 credits.

The M.S. in mathematics is designed to give capable students the preparation necessary for Ph.D. level work in addition to providing a terminal degree for those planning to enter industry or education. The M.A.T. degree provides for teaching secondary school mathematics. The Ph.D. program emphasizes research and advanced study in selected areas. The aim of the doctoral program is to provide the student with the expertise to accomplish significant research in applied or pure mathematics as well as to provide a broad and deep professional education.

### *Faculty*

*Head, Department of Mathematical Sciences and Associate Professor:* Clifton Lando

*Professors:* Jack Distad, Ronald W. Gatterdam, Gary Gislason, Barbara Lando, Robert Placenza, Philip Van Veldhuizen, (Emeritus)

*Associate Professors:* Patricia Andresen, Michael Freedmann, John P. Lambert, Mitchell Roth, Walter Tape, Dana Thomas.

*Assistant Professors:* John Gimbel, Dusan Jevtic, Ming Jiang, Pham Xuan Quang, Susan Royer, Larry Santoni, Steven Thompson

### Mathematics -- M.A.T. Degree

#### **Degree Requirements:**

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

#### **Degree Requirements:**

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

### Degree Requirements:

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.

## Music

Degrees: M.A., M.A.T.

Minimum Requirements for Degrees: M.A.--30 credits; M.A.T.--36 credits.

The curriculum of the graduate degrees in music are designed to satisfy cultural and professional objectives. 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 the graduate committee.

The music department of UAF is a full member of the National Association of Schools of Music, the national accrediting organization.

### Faculty

*Head, Department of Music and Associate Professor:* John Duff

*Professors:* Theodore DeCorso, James Johnson, Thomas Johnston, Suzanne Summerville, Gordon B. Wright

*Associate Professors:* Kathleen Butler-Hopkins, Bruno DiCecco, David Stech.

*Assistant Professors:* John Harbaugh, John Hopkins

*Instructor:* Wendy Stofer

## 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 the 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 chair and academic advisor for the student. The committee will assess the results of the preliminary examination, and then guide the development and completion of the student's program.

The committee will monitor the student's progress in the program, and recommend modifications and improvements, should changes be necessary.

7. To establish a base of core curriculum requirements common to all graduate music programs, the following courses must be taken by all graduate students:

- a. Music 601--Introduction to Graduate Study (2 Credits).
- b. Applied Music: A minimum of four credits of private lessons study at either the senior or graduate level. Committee may suggest further study if remedial work is deemed necessary.
- c. A 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, students will meet with their committees 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 their 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 their 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. All 600-level courses are restricted to graduate students only; graduate students may also elect some of their courses from the 400-level. The 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.



Victoria, a muskox calf, rests in the shade of a birch tree at the Large Animal Research Station which is associated with the Institute of Arctic Biology. UAF photo/Sam Winch

## College of Natural Sciences

Kolf Jayaweera, Dean

The College of Natural Sciences embraces several areas of study: biology and wildlife; chemistry; biochemistry and molecular biology; geology and geophysics; and physics, space physics and atmospheric sciences.

Work at the master's level is offered in all of these areas of study. Ph.D. programs are offered in all except chemistry.

Graduate programs take advantage of the outstanding campus research facilities relating to northern problems: the Geophysical Institute, the Institute of Arctic Biology, the Alaska Cooperative Wildlife Research Unit and the Alaska Cooperative Fishery Research Unit. The college also offers two interdisciplinary programs, earth sciences and general sciences, specifically intended for those seeking teaching certificates.

**Graduate Degrees** -- Master of Science in biology, zoology, wildlife management, chemistry, geology, geophysics, physics, general science, space physics and atmospheric sciences. Master of Arts in Teaching in biological sciences, chemistry, geology and physics. Ph.D. in biological sciences, physics, space physics, atmospheric sciences, geophysics and geology. The College of Natural Sciences also offers a variety of interdisciplinary degrees in ecological sciences, wildlife management, atmospheric chemistry, biochemistry and molecular biology.

### Affiliation with Northern Institutes

*Geophysical Institute:* Syun-Ichi Akasofu, Director

*Institute of Arctic Biology:* Francis Williamson, Director

*Alaska Cooperative Wildlife Research Unit:* David R. Klein, Unit Director

*Alaska Cooperative Fishery Research Unit:* James B. Reynolds, Unit Director

## Atmospheric Sciences (see Physics)

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

## Biology

**Degrees:** M.S., M.A.T., Ph.D.

**Minimum Requirements for Degrees:** M.S.--30 credits; M.A.T.--36 credits; Ph.D.--open.

Graduate Students at UAF have extraordinary opportunities to conduct independent biological research in controlled-experiment or field settings, taking advantage of arctic, alpine, and boreal environments near campus or at remote locations, and using the excellent facilities of major research institutes in Fairbanks. Areas of strong research emphasis of department faculty include circumpolar floristics, arctic plant physiology, plant-animal coevolution, Pleistocene faunas, insect ecology (terrestrial and freshwater), bird and mammal physiological ecology, mammalian physiology, vertebrate population dynamics, biology of marine fish and seabirds, molecular evolution and population genetics.

The Department of Biology and Wildlife has approximately 60 graduate students, 40 of whom are seeking biology or botany degrees. The atmosphere is informal and students and faculty interact frequently, not only in small-enrollment classes but on field trips, in intramural athletics, and in dozens of community and social settings. Teaching assistantships in department courses provide excellent experience and a helpful stipend for graduate students who do not have full research funding. Several competitive fellowships are available through the UAF Chancellor.

Graduates of UAF may go on to other universities for doctorates or post doctoral research; UAF's reputation allows good students a wide latitude for such advanced study. Many M.S. and Ph.D. recipients find professional positions with state and federal land and biological resource agencies, with whom the department faculty maintain close contact.

### *Faculty*

*Head, Department of Biology and Wildlife and Professor:* Ronald L. Smith

*Professors:* F. Stuart Chapin III, Frederick C. Dean, Howard Feder, Dale D. Feist, R. Dale Guthrie, Stephen F. Maclean, Jr., David F. Murray, Luis Proenza, Gerald F. Shields, Robert B. Weeden, Robert G. White, Frank Williamson

*Associate Professors:* W. Scott Armbruster, R. Terry Bowyer, Pierre DeViche, Jacqueline D. LaPerriere, Edward C. Murphy, Mark W. Oswood

*Assistant Professors:* Brian M. Barnes, John E. Blake, John P. Bryant, John F. Fox, Joshua Schimel, Kent E. Schwaegerle, James S. Sedinger

*Instructor:* Douglas L. Schamel

### **Botany, Biology, or Zoology -- M.S. Degree**

#### **Degree Requirements:**

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.

### **Botany, Biology, or Zoology -- M.A.T. Degree**

Persons interested in this degree program should contact the head of the department.

### **Botany, Biology, or Zoology -- Ph.D. Degree**

Complete general university and Ph.D degree requirements

## **Chemistry**

**Degrees:** M.A., M.A.T., M.S.

**Minimum Requirements for Degrees:** M.A., M.S.--30 credits; M.A.T.--36 credits

Graduates in chemistry qualify in many fields as teachers of chemistry; supervisors in industry; technical sales personnel; research chemists in federal, state, municipal, academic, or industrial laboratories; in pre-medicine; and 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 sciences, 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.

Faculty from many departments and research institutes in the university participate in the department's Program in Biochemistry and Molecular Biology. This program, which emphasizes an understanding of the molecular principles involved in life processes, provides academic and research experience for graduate students who are interested in careers in the growing area of biotechnology.

The chemistry 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 microscopes, and liquid scintillating counters are available in cooperation with other departments and institutes at UAF.

### **Faculty**

*Head, Department of Chemistry and Professor:* Paul R. Reichardt

*Professors:* Don Button, Daniel B. Hawkins, L. Claron Hoskins, David Shaw

*Associate Professors:* Lawrence Duffy, John Keller, Donald Lokken, Betty Anne Philip,

Richard Stolzberg

*Assistant Professor:* Daniel Jaffe

*Instructor:* Diane Shaw

*Coordinator of Biochemistry and Molecular Biology:* Lawrence Duffy

## **Chemistry -- M.A. or M.S. Degree**

### **Degree Requirements:**

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 the degree.

## **Chemistry -- M.A.T. Degree**

Persons interested in this degree program should see the head of the department.

## **General Science**

**Degrees:** M.S.

**Minimum Requirements for Degree:** M.S.--30 credits

The Departments of Mathematics, Physics, Chemistry, Biology and Wildlife, 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. The coordinator of the General Science program is John Murray, Department of Physics.

## **General Science -- M.S. Degree**

### **Degree Requirements:**

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.

## **Geology and Geophysics**

**Degrees:** M.A.T., M.S., Ph.D.

**Minimum Requirements for Degrees: M.S.--30 credits, including thesis; M.A.T.--36 credits; Ph.D. (open)**

Graduates in geology will have broad backgrounds in the earth sciences with firm foundations in mathematics, physics, and chemistry. 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 instructional programs, there are active research laboratories in the fields of seismology, volcanology, paleomagnetism, isotope geochronology, glaciology and ice physics. Other laboratories are also available in other divisions on campus, as listed under Research. There are approximately 40 professional geoscientists in residence on campus, and graduate students normally participate in the ongoing research of these professionals.

*Head, Department of Geology and Geophysics and Associate Professor of Geology:*  
Samuel E. Swanson

**Geology Faculty**

*Professors:* Daniel B. Hawkins, David M. Hopkins, Don M. Triplehorn

*Associate Professors:* R. A. Gangloff, Rainer J. Newberry

*Assistant Professors:* James E. Beget, R. Keith Crowder, Mary J. Keskinen, Wes Wallace, Keith Watts

*Adjunct Faculty:* Lural Burns, John Davies, John Decker, Charles G. Mull, Gar Pessel, Richard D. Reger, Thomas E. Smith, Milton A. Wiltse

**Geophysics Faculty**

*Coordinator and Associate Professor:* Joan P. Gosink

*Professors:* Carl Benson (Emeritus), Nirendra Biswas, Juergen Klenle, Thomas E. Osterkamp, David B. Stone, Eugene M. Wescott, Wilford Weeks

*Associate Professors:* Hans Pulpan, William M. Sackinger, Lewis H. Shapiro, William J. Stringer

*Assistant Professors:* Douglas Christensen, Keith A. Echelmeyer

**Geology -- M.S. Degree\***

**Degree Requirements:**

1. Complete the general university requirements and master's degree requirements.
2. Complete a minimum of 30 credits, including thesis (Geos. 699) and individual research (Geos. 698). At least 24 credits (including thesis and research) must be at the 600 level, and at least 15 credits from course work (exclusive of thesis and research) must be at the 600 level.

**OPTIONS:**

**A. General Geology Option:** Complete at least one 600-level course from each of these three general areas: 1) Sedimentology-Stratigraphy, Paleontology, Quaternary Studies; 2) Structural Geology, Tectonics, Geophysics; 3) Igneous-Metamorphic Petrology, Geochemistry, Mineral Deposits.

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

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

## Geophysics – M.S. Degree\*

### Degree Requirements:

1. Complete the general university requirements and master's degree requirements.
2. Complete a minimum of 30 credits, including thesis (Geos. 699) and individual research (Geos. 698). At least 24 credits (including thesis and research) must be at the 600 level, and at least 15 credits from course work (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 will depend upon 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 on ice, snow and permafrost studies and either geology, applied science and engineering, physics, or meteorology/oceanography (climate), depending on how far the student's degree is biased toward one given discipline.

\*To be admitted, the student is expected to have a background at least to the level of that listed for the relevant B.S. Option in Geology and Geophysics. However, deficiencies can be made up concurrently with the degree program. Acceptance for the snow, ice, and permafrost geophysics option is not limited to those with a geoscience background; students with strong physical science or engineering backgrounds are also encouraged to apply.

## Geology – M.A.T. Degree

Contact the head of the department for degree requirements.

## Geology – Ph.D. Degree

## Geophysics – Ph.D. Degree

### Degree Requirements:

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

## Physics

**Degrees:** M.S., M.A.T., Ph.D.

**Minimum Requirements for Degrees:** M.S.--30 credits; M.A.T.--36 credits; Ph.D.--no fixed credits

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

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.

Graduate work is offered in various areas of physics and applied physics including many of the research areas found in the University of Alaska Fairbanks Geophysical Institute. The research program of the Geophysical Institute currently emphasizes investigation 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.

Graduate students may designate their major field as physics, space physics or atmospheric sciences. Students will pursue their studies under the supervision of an advisory committee which will advise on the course of study to be followed.

**Faculty**

*Head, Department of Physics and Professor:* John L. Morack.

*Professors:* Syun-Ichi Akasofu, William D. Harrison, Kolf Jayaweera, Joseph R. Kan, Lou-Chuang Lee, Hans C.S. Nielsen, Manfred H. Rees, Juan G. Roederer, Glenn E. Shaw, Knut Stamnes, Daniel W. Swift, Gunter E. Weller, Gerd Wendler

*Associate Professors:* 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, Channon P. Price, Hiroshi Tanaka

*Coordinator of Graduate Program:* Daniel W. Swift

*Coordinator of General Sciences Program:* John Murray

**Physics -- M.S. Degree**

**Degree Requirements:**

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.

**Space Physics -- M.S. Degree**

**Degree Requirements:**

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

**Atmospheric Sciences -- M.S. Degree**

**Degree Requirements:**

1. Complete the general university requirements and the master's degree requirements.
2. Complete required program as arranged by conference with the graduate committee in accordance with the Physics department manual of *Policies and Procedures* for graduate studies.

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).

Basic courses in atmospheric sciences . . . . .	12
Approved physics courses (minimum) . . . . .	12

**Physics -- M.A.T. Degree**

Contact the department head for degree requirements.

**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:**

	Credits
ATM 636--Physics of the Lower Atmosphere . . . . .	3
ATM 646--Dynamics of the Atmosphere and Ocean . . . . .	3
Phys. 650--Aeronomy . . . . .	3
ATM 656--Atmospheric Circulation, Weather, and Climate . . . . .	3

**Physics Courses:**

	Credits
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

**Physics -- Ph.D. Degree  
Space Physics -- Ph.D. Degree**

1. Complete the general university requirements and Ph.D. requirements.
2. Complete the required program as arranged by conference with the graduate advisory committee and in accordance with the Physics Department manual of *Policies and Procedures* for graduate students.

**Space Physics (see Physics)**

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

**Wildlife Management**

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

**Minimum Requirements for Degrees: M.S.--30 credits**

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 closely situated to the Fairbanks campus. Studies can be made in many other habitats ranging from the dense forest of Southeastern Alaska to the arctic coast.

Adequate study collections of plants and animals are available. There is also a 2,000-acre study area near the campus. Graduates 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 often provide support for graduate student projects. Thus, an unusually good opportunity is available for students to gain experience and to make job connections.

## Wildlife Program

### Faculty

*Head, Department of Biology and Wildlife and Professor:* Ronald L. Smith  
*Program Chair and Professor:* Frederick C. Dean  
*Professors:* David R. Klein, Robert B. Weeden, Robert G. White  
*Associate Professor:* Edward C. Murphy  
*Assistant Professors:* John E. Blake, R. Terry Bowyer, James S. Sedinger  
*Research Associate:* Erich H. Follmann

*Unit Leader:* David R. Klein

The Department of Biology and Wildlife and the Alaska Cooperative Wildlife Research Unit cooperate in offering graduate work leading to the Master of Science and Doctor of Philosophy degrees. Persons desiring detailed information on the graduate program in wildlife biology and management may obtain this from the chair, Wildlife Program. The procedure to be followed in applying for admission to graduate study is outlined in the section on Graduate Admissions.

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 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 -- Ph.D. Degree

See Ph.D. general degree requirements.

## Rural College

Gerald V. Mohatt, ~~Acting~~ Dean

The Rural College was created in 1987 when the restructuring of the University of Alaska system was implemented. The Rural College is committed to educational processes through which its students are empowered to effect social and economic changes in their communities, and protect and enrich the quality of their lives and culture. Particular consideration is given to the needs of permanent residents of rural Alaska and students in non-traditional settings who seek skills and degrees suited to the rural economy and to the well-being of rural communities and the demands and needs of complex multi-cultural settings.

The college offers a range of academic and programmatic options to students which respond to the changing conditions of Alaska. The college offers graduate degrees in education and psychology. 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 is a center for the development and support of distance delivery and field-based degree and non-degree course work throughout the university. Selected degrees and certificates are offered at the dispersed campuses in the Aleutians, Bristol Bay, Chukchi, Interior, Kuskokwim, and Northwest regions of the state. These

campuses administer instructional programs in association with five departments: Behavioral Sciences and Human Services, Education, General Studies, Rural Development and Vocational/Technical Education. Research and development activities involving issues associated with rural Alaska are supported and administered through the Center for Cross-Cultural Studies. Academic and logistical support for these distance-delivered programs and correspondence study are provided through the Center for Distance Education.

## Behavioral Sciences and Human Services

The Department of Behavioral Sciences and Human Services offers three graduate programs: an M.A. in Community Psychology, M.Ed. in Guidance and Counseling (Elementary and Secondary), and an M.Ed. in College Student Personnel Administration.

The Community Psychology program trains 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.

The Guidance and Counseling programs prepare educators to be elementary counseling consultants or secondary school counselors. The program emphases are acquisition of knowledge in counseling/consultation, appraisal and research.

The program in College Student Personnel Administration is designed to train educators to function in student service positions in higher education. The history, philosophy, and contemporary issues in higher education; management concepts; principles of educational psychology, measurement and research are some of the highlights of this program.

All of the graduate programs include either a practicum or internship to give the students hands-on training. Our programs are also designed to meet the needs of rural Alaska.

### Faculty

*Head, Department of Behavioral Sciences and Human Services and Associate Professor:*  
Gerald S. Berman

*Professors:* E. Clifford Brennen, Charles Gelst, Richard Katz, Gerald V. Mohatt, M.S.  
Rao, John Turner

*Associate Professors:* Richard G. Possenti, Harris Shelton

*Assistant Professors:* Jill Baker, James Cole, William Connor, Carol Diehl, Mary Hampton, Victor Lieberman, Laurie Marum, Valerie Montoya, Cathy Sink

## Community Psychology

**Degree:** M.A.

**Minimum Requirements for Degree:** 48 credits

The M.A. program in community psychology seeks to train graduate-level practitioners in mental health and community development who can work sensitively and effectively in cross-cultural community contexts, and particularly in Native settings in rural areas and urban settings with multi-cultural populations. The program attempts to meet the demand for trained mental health professionals in rural Alaska.

### Objectives

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. The program, then, sees the community as both a resource for problem solving and as the target for change.

The program is specifically committed to learning non-Western cultures, in particular Native cultures in Alaska, so that practitioners can be culturally sensitive rather than monocultural and therefore better serve their clients. There is an emphasis in the curriculum on experiential learning and the use of self-knowledge as a basis for learning how to help others. The program seeks to increase students' self-awareness, in particular their understanding of cultural diversity and their own cultural biases, and their appreciation of the significance of their own development for effective work with individuals and communities.

The program is practice-oriented, seeking to educate practitioners who can reflect intelligently and creatively on their own and others' practice. The program is also value-full rather than value-free. Courses strive to be cross-culturally sensitive, either through course content, style of teaching or use of class and community resources. Skills such as prevention strategies, counseling, and psychological testing and expressions of Western culture, and therefore must be applied sensitively in multi-cultural situations, or if necessary, abandoned for more culturally appropriate methods of help. We seek to educate students committed to constructive social change which gives all people equal access to resources.

#### **Admittance**

Students are accepted 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.

#### **Admission Requirements**

1. 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.
2. Persons who have a non-social science background must complete the necessary undergraduate prerequisites as delineated by their adviser prior to advancement to candidacy.
3. An application must include a personal statement of the applicant's purpose in seeking this degree.

Part-time students will be accepted. The student must enroll in one core required course during the first semester.

#### **Course Requirements**

The program requires a 15-credit (5 courses) core of courses with a 12 credit hour internship and three to six credit hours for project or thesis, including an oral defense of the work which will also constitute a comprehensive exam. The student must also complete at least 9 credits (3 courses) from an approved list of courses (see below) in consultation with advisor. Additional electives are to be chosen in consultation with the advisor to make up the 30-credit hour requirement for course-work.

#### **Internship**

This is either a full-time, one-semester or part-time, one-year experience under the supervision of a qualified psychologist, mental health or human services practitioner. Placements are arranged after at least 24 credits are completed.

### Community Psychology – M.A. Degree

Required Courses . . . . .	30-33 Credits
Psy. 630--Community Psychology . . . . .	3
Psy. 631--Community Psychology: Cross-Cultural Applications . . . . .	3
Psy. 661--Cross Cultural Counseling . . . . .	3
Psy. 663--Clinical Methods & Assessment . . . . .	3
ANS. 401--Knowledge of Native Elders . . . . .	3
Psy. 690--Internship in Community Psychology . . . . .	12
Psy. 698--Project or Psy. 699--Thesis . . . . .	3-6
Complete at least 9 credits from the following:	
Psy. 625--Prevention of Alcohol & Drug Dependence . . . . .	3
Psy. 635--Field-Based Research . . . . .	3
Psy. 655--Healing: Implications for Clinical/Community Practice . . . . .	3
Psy. 660--Principles & Techniques of Individual Counseling . . . . .	3
Psy. 662--Transformational Development and Psychological therapy . . . . .	3
Psy. 688--Practicum in Community Psychology . . . . .	3
Soc. 638--Social Policy & Social Change . . . . .	3
Soc. 645--Prevention Theories & Strategies . . . . .	3

## Guidance and Counseling

**Degree:**M.Ed.

**Minimum Requirements for Degree:** 42 Credits

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 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.

### Guidance and Counseling -- M.Ed. Degree

**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 GPA 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 school at the 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 Behavioral Sciences and Human Services faculty members.

**Minimum Degree Requirements:**

1. Complete a minimum of 42 credits in approved courses. This is a non-thesis program.
2. Pass a written qualifying examination in the foundation courses after completing 15 credit 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:**

Courses . . . . .	Credits
Ed. 611--Learning, Thinking and Perception in Cultural Perspective . . . . .	3
Ed. 630--Curriculum Theory . . . . .	.3
Ed. 690--Seminar in Cross-Cultural Studies . . . . .	3
Coun. 615--Foundations of Guidance and Counseling . . . . .	3
Coun. 624--Group Counseling . . . . .	3
Coun. 628--Life Span Development . . . . .	3
Coun. 634--Practicum I . . . . .	3
Coun. 645--Behavioral Consultation . . . . .	3
Coun. 660--Cross-Cultural Counseling . . . . .	3
Coun. 698--Research Project	
SWK 306--Social Welfare: Policies and Issues . . . . .	3
Approved electives . . . . .	9

(Recommended: ANS 475; Ed. 380, 601, 603; Psy. 304; Soc. 304, 405, 408; Sp.C. 330.)

**Required Courses Secondary:**

Courses . . . . .	Credits
Ed. 611--Learning, Thinking and Perception in Cultural Perspective . . . . .	3
Ed. 690--Seminar in Cross-Cultural Studies . . . . .	3
Coun. 615--Foundations of Guidance and Counseling . . . . .	3
Coun. 623--Principles 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	
SWK 306--Social Welfare: Policies and Issues . . . . .	.3
Approved electives . . . . .	9

(Recommended: ANS 475; Ed. 380, 601, 603; Psy. 304; Soc. 304, 405, 408; Sp.C. 330.)

**Guidance and Counseling--Certification Program**

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 of teaching experience 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.

**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, and community individual.

**Minimum Degree 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 credit hours of an approved program.

Prerequisite courses to this program must appear in the Master's 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 . . . . .	Credits
*Coun. 615--Foundations of Guidance and Counseling . . . . .	3
*Coun. 624--Group Counseling . . . . .	3
*Coun. 628--Life Span Development . . . . .	3
Coun. 634--Counseling Practicum I . . . . .	3
*Coun. 645--Behavioral Consultation . . . . .	3
Coun. 660--Cross Cultural Counseling . . . . .	3
SWK 306--Social Welfare: Policies and Issues . . . . .	3

\*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's 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: . . . . .	Credits
*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--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.

## College Student Personnel Administration

**Degree:**M.Ed.

**Minimum Requirements for Degree:**36 Credits

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) . . . . .	6
9 credits selected from the following*:	
Ed. 611--Learning, Thinking and Perception in Cultural Perspective . . . . .	3
Ed. 612--Cultural and Phil. Found. of Education . . . . .	3
CSP 661--Practicum in Counseling: Higher Education . . . . .	3
Psy. 304--Personality . . . . .	3

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

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

## Education

**Degrees:** M.Ed., Ed.S.

**Minimum Requirements for Degrees:**M.Ed.--minimum of 36 credits; M.A.T.--minimum of 36 credits; Ed.S.--minimum of 30 credits beyond master's.

**Faculty**

*Head, Department of Education and Professor:* Judith S. Kleinfeld  
*Professor:* Raymond J. Barnhardt, David M. Smith

*Associate Professors:* Dennis Demmert, Patrick J. Dubbs, Ralph B. Gabrielli\*, Perry Gilmore, Stephen F. Grubis, David A. Hagstrom, Jerry M. Lipka\*, William H. Parrett, Richard E. Riedl, Barry Sponder\*, Lillian P. Stinson

*Assistant Professors:* Mary M. Birkeland\*, Wendy J. Esmalika, Eber Hampton, Barbara G. Harrison, Oscar Kawagley\*, Eric C. Madsen\*, Patricia A. Nelson, Dennis G. Schall\*, Jolene Workman

*Instructors:* Lamont E. Albertson\*, Beverly Grogan\*, Perry T. Mendenhall\*, Karen Noordhoff, William R. Pfisterer, Mary Slaughter, Sidney Stephens

\*Non-Fairbanks Faculty

**Education -- M.Ed. Degree**

The Master of Education program offers several options from which a person selects an area of specialization. Inquiries concerning options and the specific requirements of each option should be directed to the Department of Education.

**Admission Requirements:**

Minimum requirements for admission to the M.Ed. program are:

1. A bachelor's degree, with a minimum of 24 credits of education courses with an average GPA of 3.00, and
2. One year of satisfactory teaching experience or administrative experience in public schools or appropriate experience.

Applications for admission must be made through University Admissions and Records Office. To be considered for acceptance, the following must be submitted by the applicant:

- a. A completed and signed application form.
- b. All transcripts of college credits earned.
- c. Three letters of reference.
- d. A 4-5 page written essay containing a critical self-evaluation of past educational experiences, a discussion of career goals and the reasons for choosing to apply to the UAF Department of Education.
- e. Admission may also be contingent upon a satisfactory interview with members of the Department faculty. The interview may be conducted by audioconference.

**Minimum Degree Requirements:**

1. Complete the general university requirements and master's degree requirements.
2. Complete the following core requirement:

Courses . . . . .	Credits
Ed. 601--Educational Research . . . . .	3
Ed. 602--Design and Practice of 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 . . . . .	.3
Ed. 612--Cultural and Phil. Foundations of Education . . . . .	.3
Ed. 615--Social Organization of Classrooms and Learning . . . . .	.3
Ed. 620--Language, Literacy and Learning . . . . .	.3

3. Complete a minimum of 15 credits from one of the following areas of specialization to be selected in consultation with the students advisory committee:

- Cross-Cultural Education
- Curriculum and Instruction
- Educational Leadership
- Language and Literacy

4. NOTE: The course-work must meet the following conditions:
- a. A total of 36 credits must be completed beyond the baccalaureate degree.
  - b. A minimum of 30 semester hours must be at the 600 level.
  - c. A minimum of 15 credits completed on the Fairbanks campus.
  - d. No more than 9 semester credits can be transferred from other institutions
  - e. No more than 9 semester hours earned at UAF prior to admission to the M.Ed. program may count toward the degree.
  - f. A minimum of 6 credits completed in a field-setting must be completed for the cross-cultural option.

5. Present a synthesizing paper upon completion of the core program.

6. write a project or thesis.

7. Presentation of project or thesis results

Note: The candidates and their committee will meet a minimum of three times during the student's 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, and at least one semester before graduation.

### Type B Administrative Certificate

#### Admission Requirements:

Admission to the State of Alaska, Type B Certification program is accomplished by applying for graduate study at UAF through Admissions and Records, and indicating that the application is for the Department of Education, Type B Certification only. Applicants to the M.Ed. in Educational Leadership may apply concurrently for the Type B Principal Certificate. (To attain both the M.Ed. and Certification requires 42 hours of course work.) Applicants who apply only for the Certificate of Principal's Endorsement must have a master's degree. Applicants who apply only for the Superintendent's Endorsement must have an Ed.S. or Doctorate. Certification is granted by the State upon recommendation of the UAF Department of Education. Upon admission, students will be assigned an advisor who will oversee their course program and internship.

#### Minimum Certification Requirements:

1. A master's degree.
2. Three years of successful public experience.
3. A Principal or Superintendent internship, depending on which certificate is being sought (Ed. 664 or Ed. 665).
4. Complete the following courses:

courses . . . . .	credit
**Ed. 630--Curriculum Theory or	
**Ed. 631--Small School Curriculum Design . . . . .	3
**Ed. 650--Organizational Behavior	
in Schools . . . . .	3
**Ed. 651--Large and Small School	
Management Processes . . . . .	3
**Ed. 652--Effective Schooling Practices . . . . .	3
**Ed. 653--Instructional Leadership	
in Public Schools . . . . .	3
**Ed. 654--School Law . . . . .	3
**Ed. 660--Educational Administration	
in Cultural Perspective . . . . .	3
**Ed. 664--Internship: Principal's Endorsement or	
Ed. 665--Internship: Superintendent's	
Endorsement . . . . .	3
Ed. 691--Contemporary Issues in Education . . . . .	3

## 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 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. A minimum GPA 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. Student may transfer up to 9 hours from another university into their 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 programs, they may not be applied toward the Education Specialist Degree).
    - a. Course work (12 semester hours) . . . . . Credits
 

Ed. 601--Introduction to Educational Research . . . . .	.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 the completion of a minimum of 24 hours of graduate study) . . . . .	.3
    - b. Field Study or Internship (minimum of 6 semester hours) . . . . . 6
- 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. Students will prepare the design at UAF; and, will live in the community for one semester of the internship gathering data. Students will submit a written report on their findings and will defend the report and their conclusions in an oral examination before their advisory 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 areas of specialization and concentration (minimum of 18 semester hours).**

**A. Public School Administration (Public School Superintendent Credential Endorsement):**

**1. Admissions Requirements:**

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 (equivalent graduate courses approved by candidate's committee may be substituted):**

Courses . . . . .	Credits
Ed. 650--Organizational Behavior in Schools . . . . .	.3
Ed. 651--Large and Small School Management Processes . . . . .	.3
Ed. 652--Effective School Practices . . . . .	.3
Ed. 654--School Law . . . . .	.3
Ed. 655--Public School Finance . . . . .	.3
Ed. 660--Educational Administration in Cultural Perspectives . . . . .	.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. 497--Formal Organizations

**B. Cross-Cultural Studies Area of Specialization and Concentration:**

**1. Admissions Requirement**

Applicant should have a master's degree in an approved areas 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)**

Courses . . . . .	Credits
Ed. 602--Design and Practice of Educational Research . . . . .	.3
Ed. 612--Cultural and Philosophical Foundations of Education . . . . .	.3
Ed. 615--Social Organization of Classroom and Learning . . . . .	.3
Ed. 620--Language, Literacy and Learning . . . . .	.3
Ed. 611--Learning, Thinking and Perception in Cultural 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

## Teacher Certification

Students may qualify for teaching certificates in various states only by planning their program to meet specific requirements. To obtain an Alaskan teaching certificate students should confer with the Department of Education to obtain course requirements and application procedures to the Teacher Education Program. It is essential that the student have the necessary prerequisites and be admitted to the Teacher Education Program prior to acceptance for placement in student teaching in the public schools. Students may be endorsed for secondary certification only in majors which have been approved by the Alaska Department of Education.

### Elementary Education Certification Requirements:

Courses . . . . .	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 . . . . .	3
Ed. 423--Reading, Language and Literacy . . . . .	3
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

\* A minimum of 6 credits of math is required for admission to student teaching.  
(Math. 205 and 206 recommended.)

### Secondary Education Certification Requirements:

Courses . . . . .	Credits
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 . . . . .	3
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 Influences in Education . . . . .	3
Ed. 450--Education and Cultural Transmission . . . . .	3

### 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.

### **Teachers for Alaska Program**

This program is designed to provide teaching certification to students with a baccalaureate degree who want to teach at the secondary school level either in small rural schools or in Alaska's urban multi-cultural secondary schools. The program offers two options 1) secondary certification in a subject area; 2) K-12 small schools certification. Students participate in a full time program that features small seminars, an apprenticeship, a cohort student group, and a graduate level approach to preparation for teaching.

Students enroll in a Fall and Spring/Late Spring block of integrated, tightly sequenced courses. The fall program consists of Ed. 582 -- Teaching as Reflective Inquiry, Ed. 583 -- Teaching as Decision-Making and Invention, and Ed. 584 -- Practicum. The Spring/Late Spring block consists of Ed. 453 or Ed. 455 -- Student Teaching, Ed. 619 -- Reflective Inquiry into Multicultural Classrooms and communities, and Ed. 692 -- Designing Learning Environments. The K-12 certification option requires additional course work.

Inquiries should be addressed to the Teachers for Alaska program office on the Fairbanks campus.

### **Acceptance to Teacher Education**

Any student wishing to become certified for teaching through the University of Alaska Fairbanks must be formally accepted for admission and be accepted to the teacher education program. The application process should be initiated during enrollment in Ed. 201, or, for transfer student and in other special cases, at least during the semester prior to enrolling in any methods courses.

### **Criteria for Admission to Teacher Education**

The Admissions Committee will consider a variety of information, including the following:

1. Academic Competence
2. Successful experience in one of the following contexts:
  - a. public school classrooms
  - b. other settings with children
  - c. rural Alaska
3. Interpersonal, intercultural, and communication skills
4. 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.

## **School of Agriculture and Land Resources Management**

**James V. Drew, Dean (Fairbanks)**  
**G. Allen Mitchell, Associate Dean (Palmer)**

The School of Agriculture and Land Resources Management is composed of the Divisions of Resource Management, Forest Sciences, and Plant and Animal Science. Also included is the Agricultural and Forestry Experimental Station with facilities 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 Master of Science degree in natural resources management. The courses and program 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 Services, U.S. Forest Service, the Bureau of Land Management, Soil Conservation Borough, Alaska Association of Soil Conservation Subdistricts, and U.S. Fish and Wildlife Service.

### **Division of Resources Management**

#### *Faculty*

*Division Head and Professor:* Alan Jubenville

*Professors:* Wayne C. Thomas, Robert B. Weeden

*Associate Professors:* Carol E. Lewis, William G. Workman

*Assistant Professors:* Thomas J. Gallagher, Carla A. Kirts, Ruthann B. Swanson

### **Division of Forest Sciences**

#### *Faculty*

*Division Head and Professor:* Keith Van Cleve

*Associate Professors:* Anthony Gasbarro (CES)

*Assistant Professors:* John D. Fox, Glen P. Juday, Edmond C. Packee, John A. Yarie

### **Division of Plant and Animal Sciences**

#### *Faculty*

*Division Head and Professor:* Frank J. Wooding

*Associate Professors:* Donald E. Carling (Palmer), Fredric M. Husby, Jenifer H. McBeath, Jay D. McKendrick (Palmer), Stephen D. Sparrow

*Assistant Professors:* Leroy Ben Bruce (Palmer), Robert F. Cullum, Patricia S. Holloway, Merlam G. Karlsson, Michael T. Panciera, Chien-Lu Ping (Palmer), Paul M. Windschitl (Palmer)

*Instructor:* Charles W. Knight

### **Agricultural Research Services, U.S.D.A.**

*Research Soil Scientists:* Verlan L. Cochran, Elena B. Sparrow

*Research Weed Scientist:* Jeffery S. Conn

*Research Soil Physicist:* Brenton Sharratt

## **Natural Resources Management**

**Degrees:** M.S.

**Minimum Requirements for Degree:** M.S.--30-35 credits

### **Natural Resources Management – M.S. Degree**

#### **Degree Requirements:**

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, as well as, 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 familiarity with research procedures and techniques in one or more of the resources 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 the number of thesis credits taken, the student's 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 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 credit hours of thesis;
    - 2. a minimum of 19 credits of additional courses;
    - 3. the 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. A baccalaureate degree in an 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 resources 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.

## 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. Engineers turn scientific knowledge into goods and services useful to human beings and are responsible to society in the decisions they make. An engineer is interested in creating, and is willing to work as a member of a professional team in a position of leadership.

In addition to providing the training necessary for entrance into the professional practice of engineering, an undergraduate degree in engineering provides an excellent background for those desiring to enter law, medical or business school. The

engineering programs at the university emphasize northern problems and principles; therefore, engineering and technology graduates of UAF are in great demand not only in the Alaskan job market, but in all areas of the United States where engineering involving the additional problems of high latitude are a factor. Many of the leading professional engineers in Alaska are graduates of the UAF engineering program.

The school offers graduate-level programs in engineering and science 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.

## Arctic Engineering

**Degree: M.S.**

**Minimum Requirements for Degree: 30 credits (beyond Bachelors Degree in Engineering)**

The arctic engineering program is administered by the Civil Engineering Department in cooperation with the Department of Mechanical Engineering and 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 prepares an engineer to understand and adapt to cold regions problems. It also allows the student to round out the program with advanced elective courses in a 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.

### Arctic Engineering -- M.S. Degree

#### Degree Requirements:

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<br>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 or 699--Thesis or Project . . . . .                                                                                                              | 3       |
| Electives: 12 credits in areas related to or supportive of the student's degree program. All electives must be approved by the student's graduate committee. |         |

3. Pass the state Engineer-in-Training Examination.

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

Note: C.E. 603, Arctic Engineering is not an approved elective for M.S. in Arctic Engineering.

## Civil Engineering

**Degrees:** M.C.E., M.S.

**Minimum Requirements for Degrees:** M.C.E. or M.S.--30 credits

Civil engineers plan, design, and supervise the construction of facilities essential to modern life in both the public and private sector - facilities that vary widely in nature, size and scope: space launching facilities, offshore structures, bridges, buildings, tunnels, highways, transit systems, dams, airports, irrigation projects and treatment facilities for wastewater.

Civil engineers are leading users of today's sophisticated high technology and are in the forefront of high-technology's newest applications. They employ the latest concepts in computer-aided engineering (CAE/CAD) during design, construction, project scheduling and cost control.

The opportunity for creativity is unlimited given the wide scope of projects covered by civil engineering.

The civil engineering program at UAF began in 1922, had its first graduates in 1931 and since has graduated 500 men and women. Many of these graduates work in Alaska's cities, towns and villages in a wide range of responsible positions. Over 60% of Alaska's professional engineers practice in civil engineering. Civil engineers continue to provide a significant contribution to society. The UAF civil engineering program has been accredited since 1940. The program is presently accredited by the national Accreditation Board for Engineering and Technology (ABET). All engineering programs in the department give special attention to problems of northern regions. Graduate students may 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, a specialty in **Water Resources and Hydrology** is available. 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** administered within the Civil Engineering department is available. (See EQE program)

### Faculty

*Head, Department of Civil Engineering and Associate Professor:* J. Leroy Hulsey

*Professor:* Robert F. Carlson, P.E., Douglas L. Kane, P.E., William Mendenhall, P.E. (Emeritus), Timothy Tilsworth, P.E..

*Associate Professors:* Jan Botha, P.E., Thomas C. Kinney, P.E., Lutfi Raad, P.E.

*Assistant Professor:* Mark A. Tumeo, P.E.

### 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 work out a program to remove background deficiencies with their graduate committee.

A student will elect a civil engineering program approved by the 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 must meet the general university requirements and master's degree requirements plus an additional 30 credits approved by the 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 must pass a State Engineering-in-Training Examination prior to the awarding of the degree.

## Electrical Engineering

**Degrees:** M.E.E., M.S.

**Minimum Requirements for Degrees:** M.S.--30 credits; M.E.E.--32 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. They also 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. 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 goals are 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

*Head, Department of Electrical Engineering and Professor:* John D. Aspnes, P.E.

*Professors:* Robert P. Merritt, P.E. (Emeritus), Dean J. Patterson (visiting), Thomas D. Roberts, P.E. (Emeritus)

*Associate Professors:* Kenneth J. Kokjer, P.E.; George Mulligan, P.E.

*Assistant Professors:* Joseph G. Hawkins, Charles E. Mayer, B. David Spell, P.E., Gerald Walker

## 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.

General University requirements, as well as 32 credits of course work approved by the student's advisory committee, must be completed beyond the Bachelor of Science degree. 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

Students 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 and Science Management

**Degrees:** M.S.

**Minimum Requirements for Degrees:** 33 credits (beyond a bachelor's degree in engineering or a scientific field)

The engineering and science management curriculum is designed for graduate engineers and scientists who will hold executive or managerial positions in engineering, construction, industrial, or governmental organizations. The curriculum includes human relations, financial, economic, quantitative, technical and legal subjects useful in solving problems of management.

The curriculum includes graduate-level core courses in the subjects named above, plus additional course work either directed toward special problems such as arctic engineering or in one of the more general fields of engineering or science through projects or research in the application in management principles. In addition to an undergraduate degree, a candidate should have had on-the-job experience in engineering or science.

Candidates for the engineering management degree must hold a previous degree in an engineering discipline; candidates for the science management degree must hold a degree in a natural or physical science.

### Faculty

*Head, Department of Engineering and Science Management and Professor:* F. Lawrence Bennett, P.E.

*Associate Professor:* H. Andrew Scott, P.E. (visiting)

*Lecturers:* Clark R. Milne, P.E., B.G. Olson

### Engineering Management -- M.S. Degree

### 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
ESM 601--Engineers in Organization . . . . .	.3
ESM 609--Project Management or	
BA 643--Marketing Management* . . . . .	3
A third course chosen from:	
BA 643--Marketing Management* . . . . .	3
ESM 608--Legal Principles for ESM . . . . .	3
ESM 609--Project Management . . . . .	3
BA 661--Human Resource Management* . . . . .	3
b. Six credits, chosen from . . . . .	6
ESM 605--Engineering Economy . . . . .	.3
ACCT 602--Financial Accounting	
Concepts for Administrators* . . . . .	3
BA 625--Financial Management* . . . . .	.3
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 . . . . .	.3
ESM 621--Operations Research . . . . .	3
BA 605--Management Information Systems* . . . . .	3
d. ESM 684--Project: 3 credits . . . . .	3
e. Nine credits of electives in the student's technical specialty . . . . .	.9
<b>TOTAL . . . . .</b>	<b>33</b>

\*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.

Substitutes for one or more of the courses listed above are permitted if similar courses are included in the student's previous academic background. Nor 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 substitutes and transfer of credit must be approved by the department.

At least 24 Credits, including thesis and research, must be at the 600 level.

## Environmental Quality Engineering and Science

Degrees: M.S.

**Minimum Requirements for Degrees: 30 credits**

The environmental quality engineering curriculum is administered through the Civil Engineering Department and designed for graduate engineers and science majors who will pursue careers in the areas of water supply, treatment, and distribution; waste treatment, stream pollution, air pollution and solid-waste disposal, hazardous and toxic waste management, and environmental impact evaluation. 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 Coordinator and Professor: Timothy Tilsworth, P.E.  
 Professor: Robert F. Carlson, P.E.; Ronald A. Johnson, P.E.

Associate Professor: Edward J. Brown

**Environmental Quality Engineering -- M.S. Degree**  
**Environmental Quality Science -- M.S. Degree**

**Degree Requirements:**

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 Process . . . . .	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 the advisory 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 science majors 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. This requirement will be treated as a deficiency for those students who have not met it.

## Mechanical Engineering

**Degrees: M.S.**

**Minimum Requirements for Degrees: M.S.--30 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 graduate work in engineering.

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.

**Faculty**

*Head, Department of Mechanical Engineering and Professor:* Ronald A. Johnson, P.E.

*Professors:* Vincent S. Haneman, Jr., P.E., Jim B. Nedemann, P.E., John P. Zarling, P.E.

*Associate Professor:* Deben K. Das, P.E., Terry McFadden, P.E.



Assistant Professors: Grant C. Baker (visiting), Luis C. Gominho, P.E., Jonah Y.H. Lee, P.E., Jeff C. Nash (visiting)

**Mechanical Engineering -- M.S. Degree**

**Degree Requirements:**

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

	Credits
a. Mathematics Core . . . . .	6
Select at least two of the following:	
Math. 421--Applied Analysis I . . . . .	4
Math. 422--Applied Analysis II . . . . .	4
Math. 423--Applied Mathematics . . . . .	3
Math. 310--Numerical Analysis . . . . .	3
Any 600 level mathematics course . . . . .	3
b. Mechanical Engineering Core . . . . .	12
Select at least four of the following:	
M.E. 601--Finite Element Analysis . . . . .	3
M.E. 604--Experimental Mechanics . . . . .	3
M.E. 617--Power Analysis . . . . .	3
M.E. 631--Advanced Mechanics of Materials . . . . .	3
M.E. 634--Advanced Materials Engineering . . . . .	3
M.E. 641--Advanced Fluid Mechanics . . . . .	3
M.E. 642--Advanced Heat Transfer . . . . .	3
M.E. 685--Arctic Heat Transfer and Mass Transfer . . . . .	3
c. Approved Electives . . . . .	6
Any M.E. or other engineering/science/mathematics graduate courses approved by the student's advisory committee.	
d. M.E. 699--Thesis . . . . .	6
e. NOTE: All students must take at least one course in the mechanical systems sequence (M.E. 601, 631, 634) and one from the fluids/thermal science sequence (M.E. 641, 642).	
Total . . . . .	30

Candidates for the M.S. in Mechanical Engineering must pass the Engineering-In-Training Examination or the Graduate Record Examination in Engineering.

**School of Fisheries and Ocean Sciences**

Vera Alexander, Acting Dean

The School of Fisheries and Ocean Sciences (SFOS) was created in 1987. It is the result of the merger of all the fisheries and marine programs of the University of Alaska into a single unit administered by one campus. This amalgamation has created an opportunity to focus and strengthen those elements into a comprehensive and cohesive unit. SFOS presently educates students at the master's level in the areas of fisheries science, marine biology, biological oceanography, chemical oceanography, fisheries oceanography, geological oceanography, and physical oceanography. Planning is also underway for a master's degree level program in seafood science and nutrition. Ph.D. degrees are offered in oceanography. Fisheries degrees at the Ph.D. level are presently undertaken on an interdisciplinary basis, but a formal Ph.D. program in fisheries is being developed.

The School of Fisheries and Ocean Sciences is home to research institutes, academic programs, and public service components throughout the state. Fisheries science degrees are offered through the Program in Fisheries by UAF at the Fairbanks Campus and at Juneau, where faculty, formerly with the School of Fisheries and Sciences at the University of Alaska Southeast (formerly the University of Alaska Juneau), are now affiliated with the Juneau Center for Fisheries and Ocean Sciences, a research unit of UAF. The Institute of Marine Science has facilities in Fairbanks and

Seward. Its faculty, through the Graduate Program in Marine Sciences and Limnology, instruct and supervise students seeking marine biology and oceanography degrees. The faculty of the Fishery Industrial Technology Center in Kodiak, while presently focusing on research, will be involved with the planned degree program in seafood science and nutrition.

### Program in Fisheries

**Degrees:** M.S.

**Minimum Requirements for Degree:** M.S.--30 credits

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.

The Juneau Center for Fisheries and Ocean Sciences (JCFOS) houses the UAF Fisheries Science Program in southeast Alaska. JCFOS has well equipped labs and a 42-foot research vessel. It is located near the Auke Bay National Marine Fisheries Service Laboratory just north of Juneau. The Fishery Industrial Technology Center (FITC) is located in Kodiak.

#### Faculty

*(Faculty research affiliations within SFOS as noted)*

**Professor:** Richard Gard (JCFOS), Jong S. Lee (FITC), Ole A. Mathisen (JCFOS)

**Associate Professor:** Willard E. Barber, Robert M. Fagen (JCFOS), John S. French (FITC), Anthony J. Gharrett (JCFOS), Lewis J. Haldorson (JCFOS), Terrance J. Guinn II (JCFOS), James B. Reynolds, Thomas C. Shirley (JCFOS), William W. Smoker (JCFOS)

**Assistant Professors:** Jeremy S. Collie (JCFOS), Charles A. Crapo (FITC), William D. Eaton (JCFOS), Brian H. Himmelbloom (FITC), Jeffrey C. Nash (FITC)

#### Fisheries Science – M.S. Degree

##### Degree Requirements:

1. Complete general university requirements for master's degree.
2. The following core courses or their equivalent are required:

	Credits
FISH 630--Quantitative Fisheries Science . . . . .	3
Biol. 650--Fish Ecology . . . . .	3
or OCN 640--Fisheries Oceanography . . . . .	3
Biol. 473--Limnology . . . . .	3
or OCN 650--Biological Oceanography . . . . .	3

### Graduate Program in Marine Sciences and Limnology

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

**Minimum Requirements for Degree:** M.S. 30 credits (beyond a bachelor's degree), Ph.D. (open).

The curriculum in the Marine Sciences program provides 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 Graduate Program in Marine Sciences and Limnology to meet their particular needs. Each application is reviewed by the program faculty. Requests for admission are considered throughout the year. Stipends for student support are awarded on a competitive basis.

**Faculty** (All faculty are affiliated with the Institute of Marine Science).

**Program Head and Professor:** William S. Reeburgh

**Professors:** Vera Alexander, Don K. Button, Sven O. E. Ebbesson, Robert Elsner, emeritus, Francis H. Fay, Howard M. Feder, John J. Goering, C. Peter McRoy, A. Sathy Naidu, Thomas C. Royer, David G. Shaw.

**Associate Professors:** R. Theodore Cooney, Susan M. Henrichs, Raymond C. Highsmith, John J. Kelley, Zygmunt Kowalik, H. Joseph Niebauer, F. Gerald Plumley, Donald M. Schell.

**Assistant Professors:** Walter R. Johnson, George W. Kipphut, David L. Musgrave, Brenda L. Norcross

## Oceanography

Oceanography is both interdisciplinary and multidisciplinary. The emphasis in oceanography is on processes influencing the ocean's circulation, composition, biological productivity and geology. Students considering graduate study in oceanography should have a strong background in one of the sciences (physics, chemistry, biology, geology, mathematics) and a working familiarity with the others. The Graduate program in Marine Sciences and Limnology offers M.S. degrees in several areas of oceanography (physical, chemical, biological, geological, fisheries) and marine biology. Limnological research projects are also undertaken under the oceanography degree. The Ph.D. degree is offered oceanography. Students entering both the M.S. and Ph.D. program are expected to complete a core curriculum dealing with the various areas of oceanography. Additional courses are selected from other areas in the university to assure a high level of competence in the student's area of major interest. Research is the major emphasis in the M.S. and Ph.D. programs. Challenging and significant problems are available for degree research.

Opportunities for laboratory and field work are available through the School of Fisheries and Ocean Sciences and the Institute of Marine Science. These include laboratories at Fairbanks, the Seward Marine Center, the Juneau Center for Fisheries and Ocean Sciences, and the Fishery Industrial Technology Center at Kodiak. Research vessels operated by the institute and school include the R/V *Alpha Helix* which has open ocean capabilities and operates in Alaskan coastal waters, the Gulf of Alaska, and the Bering Sea, the R/V *Little Dipper* which operates on day trips in Resurrection Bay, and the R/V *Maybeso* which operates in southeast Alaskan waters. Laboratory facilities include a seawater system at Seward and a variety of modern and analytical instrumentation, including mass spectrometers, a variety of alpha, gamma and beta counting equipment, a flow cytometer facility and a variety of gas and liquid chromatography equipment. Mainframe and personal computing facilities are readily accessible to graduate students.

Students are admitted to the Graduate Program in Marine Sciences and Limnology on the basis of their ability and the capability of the program to meet their particular interests and needs. Requests for admissions are considered continually and each application is reviewed by the department faculty. Stipends for financial support are awarded competitively. Limited fellowship support is available. Most students are supported on research projects that relate directly to their degree research.

### Oceanography -- M.S. Degree

#### Degree Requirements:

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). All fisheries oceanographers must take MSL 640 and any three of the above courses. All oceanographers will complete 3 or of seminar (MSL 692). At least 24 credits, including thesis and/or research, must be at the 600 level.

3. Oceanography majors must demonstrate field experience aboard an oceanographic vessel.

### **Marine Biology -- M.S. Degree**

A graduate curriculum in marine biology is offered by the Graduate Program in Marine Sciences and Limnology. Marine biology and biological oceanography have different foci. Marine biology focuses on the organisms, while biological oceanography focuses on how biological processes influence and are influenced by the ocean environment.

Graduate students are afforded excellent opportunities for laboratory and field research through the Institute of Marine Science. Laboratory facilities are available at Fairbanks, the Seward Marine Center, the Juneau Center for Fisheries and Ocean Sciences, the Fishery Industrial Technology Center at Kodiak, and at a number of coastal field sites. Opportunities for field work are available on the R/V *Alpha Helix* which operates along the Alaskan Coast and in the Bering Sea, on the R/V *Little Dipper* which operates in Resurrection Bay, and on the R/V *Maybeso* which operates in Southeast Alaska.

Students are admitted to the Graduate Program in Marine Sciences and Limnology on the basis of their ability and the capability of the program to meet their particular interests and needs. Requests for admissions are considered continuously and each application is reviewed by the department faculty. Stipends for financial support are awarded competitively. Limited fellowship support is available. Most students are supported on research projects that relate directly to their degree research.

#### **Degree Requirements:**

1. Complete the general university requirements and master's degree requirements.  
2. Complete a minimum of 30 credits including MSL 610, MSL 611, MSL 615; three credits of MSL 692, and any one of the following: MSL 620, 630, 650, 660, or BIOL 652. At least 24 credits, including thesis and/or research, must be at the 600 level.

### **Oceanography -- Ph.D. Degree**

There are no fixed course requirements, nor is an M.S. degree required to earn the Ph.D. degree. This degree is awarded for proven ability and scholarly attainment and each candidate's program is planned with their graduate advisory committee. A candidate for the Ph.D. degree in the Marine Sciences program will be expected to have course work at least equivalent to that required for the M.S. degree.

## **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, small or complex organizations.

The graduate program is designed to provide management education for students with a wide variety of undergraduate degrees. The objectives of the school impose the obligation to prepare literate, articulate and liberally educated business specialists, knowledgeable in fundamental economic laws, accounting and information systems, and keenly sensitive to interpersonal relationships and the dignity of the individual. The school seeks to provide the technical knowledge of the accounting, economics and management professions while also emphasizing an awareness of our society and its ethical, moral and cultural values. All of these programs are designed to emphasize the problems and circumstances unique to Alaska, including treatment of

start-up or venture management, international trade, regional economic development, regulation, financial institutions and markets, transportation, natural resource economics, hotel administration, and a comprehensive professional program in accounting.

The school offers the Master of Business Administration degree and the Master of Science in resource economics.

## Business Administration

**Degrees: M.B.A.**

**Minimum Requirements for Degree: M.B.A.--30 credits**

The business administration department offers professional training in the field of 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.

The MBA program is accredited by the American Assembly of Collegiate Schools of Business (AACSB).

### *Faculty*

#### *Business Administration*

*Head, Department of Business Administration and Professor: Peter G. Blesiot*

*Professors: David B. Hoffman, William G. Phillips, Michael L. Rice*

*Associate Professors: Marvin J. Andresen, Anne Marie Francesco, John A. Lehman,*

*Mary Lindahl, Ralph W. Nestor, John N. Taylor, Paul C. Taylor, Howard Zach*

*Assistant Professors: Joseph Ben-ur, Cory R. Borgeson (adjunct), Laura M. Milner, R.*

*Kelley Pace, Mark Speece*

*Lecturers: Richard W. Hompesch III, Charles Dexter*

#### *Accounting*

*Head, Department of Accounting, Graduate Director of MBA program and Professor: M. Burton Olen*

*Professor: Milton A. Fink, B. Henry Wichmann*

*Associate Professor: Thomas E. Bartlett, Ken Boze, Clifford T. Cox, E. Thomas Robinson*

### **Business Administration -- M.B.A.**

#### **Admission Requirements:**

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.

#### **Degree Requirements:**

1. Complete the general university requirements and master's degree requirements.
2. 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.
3. 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.

4. Students who elect to write a thesis must pass an oral defense of thesis examination.

**M.B.A. Requirements:**

Recognizing that competence in the practice of management necessitates training in both breadth and depth, the MBA program at the University of Alaska Fairbanks consists of 18 courses, or the equivalent of a two-year program. The course is divided into two segments, as follows:

**1. Foundation Courses:**

Admission to the program is open to those who hold 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

**2. 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 met the majority of the prerequisite requirements may be permitted to enroll in an MBA core course prior to completion of the foundation core program.

Advanced 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

3. 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.

4. Students writing a thesis, will substitute 6 credits of thesis for B.A. 698, research project, and 3 credits of electives.

## Economics

**Degrees: M.S.**

**Minimum Requirements for Degree: M.S.--30 credits**

Economics is the study of those social activities 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 of Economics offers work leading to the Master of Science degree in resource economics. The resource economics program offers a specialization in the economics of natural resources with emphasis in a variety of specific fields possible through interdisciplinary elective courses and thesis research, e.g., fisheries, wildlife management, land resources management, agriculture, oil and minerals, water resources and forest management. The program consists of core course work in micro- and macro-economic theory, mathematical economics, economic methods and courses in the economic theory and public policy of natural resources. Master's candidates will be required to write a thesis. Thesis topics, consistent with students' interest and project requirements, may be selected from current research projects of the department or from one of the several research institutes on campus. Most research projects deal with issues pertinent to the development and management of Alaska's renewable and nonrenewable resources.

### *Faculty*

*Head, Department of Economics and Assistant Professor: Monica Thomas*

*Associate Professors: John Boyce, Kristen Keith, J. Patrick O'Brien, Yeung-nan Shieh*

*Assistant Professors: Richard Adu-Asamoah (visiting), Chris Fawson, Yong U. Glasure (visiting), Robert R. Logan, Steven Yen (visiting)*

### **Resource Economics -- M.S. Degree**

#### **Admission Requirements:**

1. Baccalaureate degree in appropriate undergraduate major.
2. 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.
3. Scores of the general aptitude sections of the Graduate Record Examination.

#### **Degree Requirements:**

1. Complete the general university requirements and master's degree requirements.
2. Complete a minimum of 30 credits of course work, including Econ. 699--Thesis, in the field of resource economics. At least 24 credits, including thesis, must be at the 600 level.

#### **3. 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 . . . . .	0
Elective Courses: must be approved by graduate committee (minimum) . . . . .	.6
Thesis: ( minimum) . . . . .	.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 course work:

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 33 credits of course work, including Econ. 699--Thesis, in the field of mineral economics. At least 27 credits, including thesis, must be at the 600-level.

4. Emphasis Requirements:

Required Courses: . . . . .	Credits
Econ. 601--Microeconomics Theory . . . . .	3
Econ. 603--Macroeconomics Theory . . . . .	3
Econ. 623 <sup>*</sup> --Mathematical Economics . . . . .	3
Econ. 626--Econometrics or	
Min. 635--Geostatistical Ore	
Reserve Estimation . . . . .	3
Econ. 635--Resource Economics . . . . .	3
Econ. 636--Resource Economics II . . . . .	3
Econ. 670--Seminar in Research Methodology . . . . .	0
Min. 621--Advanced Mineral Economics . . . . .	3
B.A. 680--Seminar in Finance . . . . .	3
Econ. 699--Thesis . . . . .	6
Approved Elective . . . . .	3

\*Students who have successfully completed differential equations may substitute an approved elective for Econ. 623.

## School of Mineral Engineering

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 geotechnics, 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 geotechnical engineering and to the exploration, development and exploitation of mineral and energy resources in the education and training of graduate students who will be tomorrow's leaders in these industries.

Graduate-level programs are 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).

## Mining and Geological Engineering

The Department of Mining and Geological Engineering has statewide responsibility for academic instruction in the fields of geological engineering and mining engineering. Overall, the objectives of the department are to prepare students for their places as contributive citizens and for professional careers in the geotechnical and mineral industries.

Programs leading to a Master of Science degree are offered in mining engineering, geological engineering and mineral preparation engineering.

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



**Faculty**

*Head, Department of Mining and Geological Engineering and Associate Professor:* Robert C. Speck

*Professors:* David R. Maneval, P.D. Rao, Frank J. Skudrzyk

*Associate Professors:* Sukumar Bandopadhyay, Scott L. Huang, Nils I. Johansen, P.E., Mritunjoy Sengupta, Warrack Willson (visiting)

*Assistant Professor:* H.K. Lin, Paul Metz

*Instructor:* Daniel E. Walsh

**Geological Engineering**

**Degrees:** M.S.

**Minimum Requirements for Degree:** M.S.--30-33 credits.

Geological engineering is a branch of engineering dealing with the application of geology. Geological engineers work with the human environment in the true sense of the word. Properties of earth materials, exploration activities, geophysical and geochemical prospecting, geotechnical engineering, site investigations and engineering geology are all phases of geological engineering.

The Master of Science in Geological Engineering degree consists of a core program and electives in either geotechnical engineering or exploration engineering. University policies 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.

**Geological Engineering -- M.S. Degree -- Thesis Option****Degree Requirements:**

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

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

4. 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.

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

**Geological Engineering -- M.S. Degree -- Non-Thesis Option****Degree Requirements:**

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

Courses . . . . .	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
G.E. 471--Remote Sensing for Engineers . . . . .	3
Approved Technical Electives (minimum) . . . . .	18

Report/Research . . . . . 3-6  
 Total Minimum . . . . . 33

3. Electives will consist of an approved course of study which will prepare the student for either exploration engineering or geotechnical engineering.  
 4. At least 24 credits, including report and/or thesis, must be at the 600 level.

## Mining Engineering

**Degree: M.S., E.M.**

**Minimum Requirements for Degrees: M.S.--30-36 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 specialization in areas of exploration, mining or mineral beneficiation.

The graduate program leads to the 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 Degree** -- The graduate program also leads to the 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.

### Mining Engineering -- M.S. Degree -- Thesis Option

**Degree Requirements:**

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--Theoretical and Experimental Methods in Rock Mechanics . . . . .	3
Min. 621--Advanced Mineral Economics . . . . .	3
Approved Technical Electives . . . . .	3-6
Min. 688--Graduate Seminar I . . . . .	1
Spring Semester . . . . .	15 Credits
Min. 433--Mining Access, Safety, and Environmental Law . . . . .	3
Min. 689--Graduate Seminar II . . . . .	1
Min. 699--Thesis* . . . . .	6
Approved Technical Electives . . . . .	3-6
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 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--Theoretical and Experimental	

Methods in Rock Mechanics or Min. 637--Mine Systems Simulation . . . . .	3
Min. 652--Numerical Method in Mine Ventilation . . . . .	3
Min. 674--Selected Topics in Rock Mechanics . . . . .	3

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

#### Degree Requirements:

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

Required courses . . . . .	credit
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

#### Degree Requirements:

1. The applicant must be a graduate from the School of Mineral Engineering, University of Alaska Fairbanks, with an engineering degree.
2. A minimum of five years of responsible engineering work is required.
3. An acceptable thesis must be submitted. An "acceptable thesis" is defined as a demonstration of professional competence combined with normal research methods working with the student's committee.

#### Admission Requirements:

1. The applicant must complete and submit a University of Alaska Fairbanks graduate application for admission form to the Director of Admissions and Records for the engineer of mines degree program. Included with the application must be a resume of engineering work experience as mentioned above in point 2.
2. The application will be reviewed by the dean of the School of Mineral Engineering for acceptance recommendation and concurrence with the thesis topic selected.

#### Thesis:

1. The thesis will be prepared to meet the formal requirements as outlined in the Graduate Manual, including filing a copy in the university library.
2. Submission of the thesis should follow the same procedures and lead times, as the submission of the application for graduation form.
3. 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, to assure that the thesis satisfactorily meets 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.

## Mineral Preparation Engineering

**Degree: M.S.**

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

### Mineral Preparation Engineering -- M.S. Degree -- Thesis Option

**Degree Requirements:**

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

**Degree Requirements:**

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

Required Course . . . . .	Credits
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 knowledge, depending upon his/her specific background and interest. Electives must be at 600 level.

## Petroleum Engineering

**Degree: M.S.**

**Minimum Requirements for Degree: M.S.--30-33 credits.**

Petroleum engineering at the University of Alaska Fairbanks offers a unique look at the challenging problems confronting the petroleum industry. Requirements for the degree 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 to unconditional acceptance following the completion of certain prerequisite courses. A number of generous research and teaching assistantships are available for the qualified candidate.

### **Faculty**

*Head, Department of Petroleum Engineering and Associate Professor:* Russell D. Ostermann

*Professor:* G.D. Sharma

*Assistant Professors:* Kaveh Dehghani, Vidyadhar Kamath, David Ogbe, Saad T. Saleh

### **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 Math Elective . . . . .	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 course work and submission of an engineering design report for 3 credits.

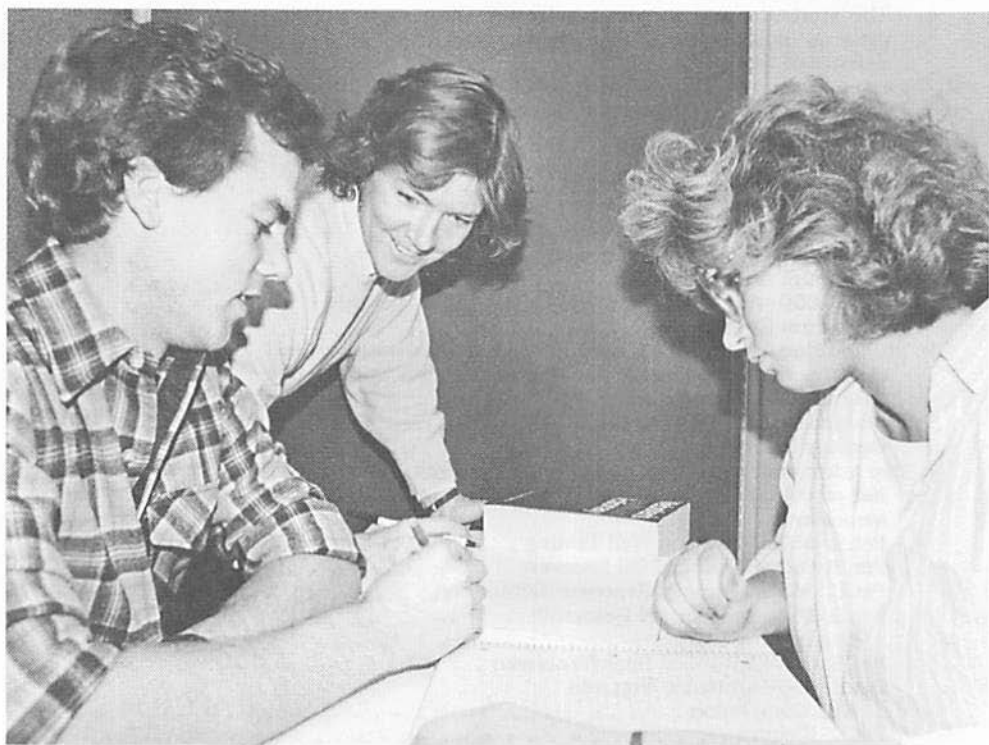
### 1. General Requirements:

- The student must complete the general university requirements and master's degree requirements;
- 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;
- The student must earn a satisfactory score on a written comprehensive exam.

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.

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. Four additional petroleum engineering electives will be required from the list of courses in c. under the thesis option.

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



Robin Lewis (left), a graduate teaching assistant in the English department, helps undergraduate Robin Krusell (right) with an assignment, while Dr. Susan Blalock (center), assistant professor of English, watches. UAF photo/Sam Winch

## COURSE DESCRIPTIONS

Course descriptions are included for all graduate level (600) courses. Titles only are listed for upper division (300-400 level) undergraduate courses. No lower division (100-200 level) courses are included as these are not allowable for credit in graduate degree programs. They may, however, be required where deficiencies must be rectified.

### Course Numbers

300-499--Upper-division courses.

600-699--Graduate courses.

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 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 offering in areas without approved graduate programs). These courses may be repeated for credit.

### Course Credits

One credit represents satisfactory completion of 800 minutes of lecture or 1600 or 2400 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 indicates lecture hours; the second, laboratory. For example (2+3) indicates that a class has two hours of lecture and three hours of laboratory work each 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.

## Accounting

Acct. 303	3 Credits	Spring	Acct. 310	3 Credits	Fall
	Governmental Accounting (3+0)			Income Tax (3+0)	
Acct. 316	3 Credits	Spring	Acct. 323	3 Credits	As Dem. Wrmts.
	Accounting Information Systems (3+0)			Petroleum Accounting (3+0)	
Acct. 342	3 Credits	Spring	Acct. 352	3 Credits	Fall and Spring
	Managerial Cost Accounting (3+0)			Management Accounting (3+0)	
Acct. 361	3 Credits	Fall	Acct. 401	3 Credits	Fall
Acct. 362	3 Credits	Spring		Advanced Accounting (3+0)	
	Intermediate Accounting (3+0)				
Acct. 403	3 Credits	Spring	Acct. 404	3 Credits	Fall
	Advanced Taxes (3+0)			Controllershship and International Accounting (3+0)	
Acct. 405	3 Credits	Spring	Acct. 452	3 Credits	Fall
	Contemporary Issues in Accounting (3+0)			Auditing (3+0)	

Acct. 471	3 Credits	As Dem. Wrmts.	Acct. 472	3 Credits	Spring
Tax Planning and Research (3+0)			Computer Control and Advanced Auditing (3+0)		

Acct. 473	3 Credits	Fall	Acct. 481	1 Credit	As. Dem. Wrmts.
Applied Systems Design (3+0)			Personal Tax Planning (1+0)		

Acct. 482	1 Credit	As Dem. Wrmts.	Acct. 483	1 Credit	As Dem. Wrmts.
Business Tax Planning (1+0)			Estate Tax Planning (1+0)		

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

### Resources Management

A.L.R. 300	1-3 Credits	Fall, Spring, Summer	A.L.R. 310	3 Credits	Spring
Internship in Natural Resources Management			Agricultural Concepts and Techniques (3+0)		

A.L.R. 360	3 Credits	Alternate Spring	A.L.R. 400	3 Credits	Alternate Spring
Outdoor Recreation Planning (3+0)			Natural Resource Policies (3+0)		

A.L.R. 401	3 Credits	Alternate Spring	A.L.R. 403	4 Credits	Alternate Spring
Natural Resources Legislation (3+0)			Managing Food Production Systems (3+3)		

A.L.R. 425	2 Credits	Spring	A.L.R. 430	3 Credits	Spring
Alaska's Reindeer Industry (2+0)			Land-Use Planning (3+0)		



A.L.R. 460 3 Credits Fall A.L.R. 461 3 Credits Alternate Spring  
Principles of Outdoor Recreation Management (2+3) Interpretive Services (3+0)

A.L.R. 462 3 Credits Fall  
Alaskan Environmental Education (3+0)  
(Same as Ed. 462)

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 Credit 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. 641 3 Credits Alternate Spring  
Natural Resource 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 resource 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. 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 status or permission of instructor. Next offered: 1988-89.)

A.L.R. 690 3 Credits Alternate Fall  
Advance Topics In Resource Management (3+0)  
Examines common and alternative assumptions basic to resource management approaches as expressed in global, national, or important local issues in resource management. (Prerequisite: Graduate standing or permission of instructor.)

## Forest Sciences

A.L.R. 340 3 Credits Spring  
Natural Resources Measurement (2+3)

A.L.R. 370 3 Credits Fall  
Introduction to Watershed Management (2+3)

A.L.R. 450 3 Credits Alternate Fall  
Forest Management (3+0)

A.L.R. 451 3 Credits Alternate Spring  
Regeneration and Silviculture of Northern Boreal Forests (2+3)

A.L.R. 452 3 Credits Alternate Spring  
Forest Protection (3+0)

A.L.R. 453 3 Credits Alternate Fall  
Harvesting and Utilization of Forest  
Products (3+0)

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: 1989-90)

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: 1989-90.)

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: 1989-90.)

**Plant and Animal Sciences**

A.L.R. 312 3 Credits Alternate Fall  
Introduction to Range Management (3+0)

A.L.R. 313 4 Credits Alternate Spring  
Introduction to Plant Pathology (3+3)

A.L.R. 320 3 Credits Alternate Fall  
Introduction to Animal Science (2+3)

A.L.R. 321 3 Credits Alternate Fall  
Applied Animal Nutrition (2+3)

A.L.R. 380 3 Credits Spring  
Soils (2+3)

A.L.R. 411 3 Credits Alternate Fall  
Plant Propagation (2+3)

A.L.R. 412 3 Credits Alternate Fall  
Field Crop Production (3+0)

A.L.R. 420 3 Credits Alternate Spring  
Animal Nutrition and Metabolism (3+0)

A.L.R. 480 3 Credits Alternate Fall  
Soil Conservation (3+0)

A.L.R. 607 3 Credits Alternate Spring  
Biotechnology (3+0)

(Same as EQE 607)

Theory and application of bioconversion and bioengineering processes for foods, agriculture, pharmaceuticals, and industrial chemicals. The use of microbiological methods (recombinant DNA, immobilized enzymes and cells, hybridomas, and mutation and selection) for the production of conventional bioproducts and in the development of new bioproducts. (Prerequisite: Biol. 442, Chem. 322. Next offered: 1989-90.)

**Alaska Native Languages**

ANL 387 3 Credits As Dem. Wrmts.  
ANL 388 3 Credits As Dem. Wrmts.  
Bilingual Methods and Materials (3+0)

---

## Alaska Native Studies

---

ANS 301	3 Credits	Alternate Fall	ANS 310	3 Credits	Fall
Native Cultural Heritage Documentation (3+0)			Alaska Native Corporations (3+0)		
ANS 320	3 Credits	Spring	ANS 325	3 Credits	Alternate Spring
Language and Culture: Applications of Alaska (3+0) (Same as Anth. 320)			Native Self-Government (3+0) (Same as P.S. 325)		
ANS 340	3 Credits	Fall	ANS 351	1-3 Credits	Fall and Spring
Contemporary Native American Literature (3+0) (Same as Engl. 340)			Practicum in Native Cultural Expression (0+variable)		
ANS 361	3 Credits	Fall	ANS 375	3 Credits	Alternate Spring
Advanced Tuma Theater (3+0) (Same as THR. 361)			Native American Religion and Philosophy (3+0)		
ANS 401	3 Credits	Fall and Spring	ANS 415	3 Credits	As Dem. Wmts.
Knowledge of Native Elders (3+0)			Comparative Economic Development Processes: Applications for Native Alaska (3+0)		
ANS 425	3 Credits	Fall	ANS 430	3 Credits	Fall
Federal Indian Law and Alaska Natives (3+0)			Alaska Native Education (3+0)		
ANS 475	3 Credits	Spring			
Alaska Native Social Change (3+0)					

---

## Anthropology

---

Anth. 300	3 Credits	As Dem. Wmts.	Anth. 305	3 Credits	As Dem. Wmts.
Anthropology of Religion (3+0)			Comparative Political and Legal Systems (3+0)		
Anth. 306	3 Credits	As Dem. Wmts.	Anth. 307	3 Credits	Alternate Spring
Economic Anthropology (3+0)			Kinship and the Family (3+0)		
Anth. 309	3 Credits	Alternate Spring	Anth. 315	3 Credits	Alternate Fall
Arctic Prehistory (3+0)			Human Biology (2+3)		
Anth. 320	3 Credits	Spring	Anth. 321	3 Credits	As Dem. Wmts.
Language and Culture: Applications to Alaska (3+0) (Same as ANS 320)			Human Population Biology (3+0)		

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                                                          |           |                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------|----------------------------------------------------------|-----------|--------------------|
| Anth. 323                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3 Credits   | Alternate Fall   | Anth. 328                                                | 3 Credits | Every Third Spring |
| Archaeology of China From Earliest Times to 771 B.C. (3+0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |             |                  | Historical and Contemporary Indian-White Relations (3+0) |           |                    |
| Anth. 329                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3 Credits   | Alternate Fall   | Anth. 350                                                | 3 Credits | Every Third Fall   |
| Peoples of the Russian North (3+0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  | Russian Period in Alaska:1741-1867 (3+0)                 |           |                    |
| Anth. 380                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3 Credits   | Alternate Fall   | Anth. 381                                                | 3 Credits | Alternate Spring   |
| The People of the Alaskan SW: Aleuts, Kodiak Islanders and the Chugach (3+0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |             |                  | The Inupiaq and Yup'ik Peoples (3+0)                     |           |                    |
| Anth. 382                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3 Credits   | Alternate Spring | Anth. 383                                                | 3 Credits | Alternate Fall     |
| The People of the Alaskan SE (3+0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  | Athabaskan Peoples of Alaska and Adjacent Canada (3+0)   |           |                    |
| Anth. 410                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3 Credits   | Alternate Fall   | Anth. 412                                                | 3 Credits | Alternate Spring   |
| History of Social/Cultural Anthropology (3+0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  | Anthropology of Art (3+0)                                |           |                    |
| Anth. 413                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3 Credits   | Alternate Spring | Anth. 414                                                | 3 Credits | As Dem. Wmts.      |
| Archaeological Method & Analysis (2+3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  | Environmental Archaeology (3+0)                          |           |                    |
| Anth. 421                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3 Credits   | As Dem. Wmts.    | Anth. 422                                                | 3 Credits | As Dem. Wmts.      |
| Analytical Techniques (2+3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  | Human Osteology (2+3)                                    |           |                    |
| Anth. 428                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3 Credits   | Every Third Fall | Anth. 461                                                | 3 Credits | Alternate Fall     |
| Ecological Anthropology (3+0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  | Stratigraphy (2+3)                                       |           |                    |
| Anth. 465                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3 Credits   | Alternate Spring |                                                          |           |                    |
| Geoarchaeology (3+0)<br>(same as Geos. 465)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                                                          |           |                    |
| 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: 1989-90.)                                                                                                                                                                                                                                                                                       |             |                  |                                                          |           |                    |
| Anth. 604                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3 Credits   |                  |                                                          |           | As Demand Warrant  |
| Seminar: Language and Culture (3+0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                                                          |           |                    |
| 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 pidgin and creole languages and effects of the introduction of writing. (Prerequisites: Graduate standing; previous credit in anthropological or descriptive linguistics or permission of instructor.) |             |                  |                                                          |           |                    |
| Anth. 608                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3 Credits   |                  |                                                          |           | Every Third Spring |
| Classics in Anthropology (3+0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                  |                                                          |           |                    |
| Landmark contributions in anthropological literature, ethnographies and theoretical works, will be discussed. (Prerequisite: Graduate standing or permission of instructors. Next offered: 1989-90.)                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                                                          |           |                    |

- Anth. 611**                                      **3 Credits**                                      **Alternate Fall**  
**Proseminar in Archaeology (3+0)**  
 An intensive coverage of advanced topics in archaeological theory and techniques of data recovery and analysis. The course will emphasize both field and laboratory aspects as well as the substantive results of archaeological research. (Prerequisites: Graduate standing or permission of instructor. Next offered: 1988-90.)
- 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. (Prerequisites: Graduate standing or permission of the instructor.)
- Anth. 613**                                      **3 Credits**                                      **As Demand Warrants**  
**Seminar: Problems in Arctic Archaeology (3+0)**  
 A seminar which focuses in depth upon topics of current interest in North American Arctic archaeology including Beringian prehistory, Interior archaeology, coastal archaeology, past arctic adaptations, etc. (Prerequisites: Graduate standing or permission of instructor.)
- Anth. 614**                                      **3 Credits**                                      **Alternate Spring**  
**Archaeology of Siberia (3+0)**  
 A thorough survey of the Paleolithic, Mesolithic, Neolithic, Bronze and Iron ages of Siberia through an examination on key archaeological sites. Data from archaeology, ethnology, linguistics and paleoanthropology will be applied to ancient populations changes and the ethnogenesis of Siberian peoples. (Prerequisites: Graduate standing or permission of instructor. Next offered: 1989-90.)
- Anth. 615**                                      **3 Credits**                                      **As Demand Warrants**  
**Seminar: Archaeological Method and Theory (3+0)**  
 This course provides training and experience in analyzing archaeological data sets and writing site reports. It will introduce current methodological and theoretical issues in archaeology, and guide the student through the development of a research design. (Prerequisite: 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: 1989-90.)
- 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 in anthropology or permission of instructor.)

**Anth. 637** **3 Credits** **As Demand Warrants**

**Methods in Ethnohistorical Research (3+0)**

In the seminar, students of anthropology are introduced in the methods of historical research, particularly the critical evaluation of written documents, problems of archaic language and paleography, and methods for assessing art and folklorist tradition as sources of history. Oral history and the data of language and archaeology are considered. (Prerequisites: Graduate standing in anthropology or permission of instructor.)

**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 instructor. Next offered: 1990-91.)

**Art**

<b>Art 301</b>	<b>3 Credits</b>	<b>Fall and Spring</b>	<b>Art 305</b>	<b>3 Credits</b>	<b>Spring</b>
<b>Intermediate Ceramics (1+4)</b>			<b>Advanced Drawing (1+4)</b>		
<b>Art 307</b>	<b>3 Credits</b>	<b>Fall and Spring</b>	<b>Art 309</b>	<b>3 Credits</b>	<b>Fall and Spring</b>
<b>Intermediate Printmaking (1+4)</b>			<b>Intermediate Metalsmithing and Jewelry (1+4)</b>		
<b>Art 311</b>	<b>3 Credits</b>	<b>Fall and Spring</b>	<b>Art 313</b>	<b>3 Credits</b>	<b>Fall and Spring</b>
<b>Intermediate Sculpture (1+4)</b>			<b>Intermediate Painting (1+4)</b>		
<b>Art 324</b>	<b>3 Credits</b>	<b>Fall and Spring</b>	<b>Art. 363</b>	<b>3 Credits</b>	<b>Alternate Spring</b>
<b>Watercolor Painting and Composition (1+4)</b>			<b>History of Modern Art (3+0)</b>		
<b>Art. 364</b>	<b>3 Credits</b>	<b>Alternate Spring</b>	<b>Art 365</b>	<b>3 Credits</b>	<b>Fall</b>
<b>Italian Renaissance Art (3+0)</b>			<b>Native Art of Alaska (3+0)</b>		
<b>Art 371</b>	<b>3 Credits</b>	<b>Fall</b>	<b>Art 401</b>	<b>3 Credits</b>	<b>Fall and Spring</b>
<b>Introduction to Computer Art (1+4)</b>			<b>Advanced Ceramics (1+4)</b>		
<b>Art 407</b>	<b>3 Credits</b>	<b>Fall and Spring</b>	<b>Art 409</b>	<b>3 Credits</b>	<b>Fall and Spring</b>
<b>Advanced Printmaking (1+4)</b>			<b>Advanced Metalsmithing and Jewelry (1+4)</b>		
<b>Art 411</b>	<b>3 Credits</b>	<b>Fall and Spring</b>	<b>Art 413</b>	<b>3 Credits</b>	<b>Fall and Spring</b>
<b>Advanced Sculpture (1+4)</b>			<b>Advanced Painting (1+4)</b>		
<b>Art 417</b>	<b>3 Credits</b>	<b>Every Third Fall</b>	<b>Art 419</b>	<b>3 Credits</b>	<b>Fall and Spring</b>
<b>Lithography (1+4)</b>			<b>Life Drawing (1+4)</b>		

Art 427	3 Credits	Every Third Spring	Art 437	3 Credits	Every Third Fall
Relief (1+4)			Intaglio (1+4)		
Art 441	3 Credits	Every Third Spring	Art 442	3 Credits	Every Third Spring
Lost Wax Casting (1+4)			Nonferrous Forging (1+4)		
Art 443	3 Credits	Every Third Spring	Art 447	3 Credits	Every Third Spring
Holloware (1+4)			Silkscreen (1+4)		
Art 450	3 Credits	Every Third Fall	Art 451	3 Credits	Every Third Spring
Raku Pottery (1+4)			Earthenware (1+4)		
Art 452	3 Credits	Every Third Fall	Art 453	3 Credits	Every Third Spring
Porcelain (1+4)			Kiln Design and Construction (1+4)		
Art 454	3 Credits	Every Third Fall	Art 455	3 Credits	Spring
Vapor Glazing (1+4)			Studio Glass (1+4)		
Art 471	3 Credits	Spring	Art 499	1-3 Credits	Fall and Spring
Computer Art (1+4)			Thesis Project		

## Atmospheric Sciences

ATM 636	3 Credits				Alternate Fall
Physics of the Lower Atmosphere (3+0)					
Small-scale physical and chemical processes in the lower atmosphere, including micrometeorology, radiative transfer and cloud physics. Subjects to be covered include the transfer of solar and thermal radiation through the atmosphere, the radiation budget at the surface of the earth, the resulting energy, momentum, and mass fluxes near the ground, water vapor and its phase changes, and the nucleation and growth of cloud droplets and precipitation particles. (Prerequisite: Graduate standing in geosciences or permission of instructor. Next offered: 1989-90.)					
ATM 646	3 Credits				Alternate Spring
Dynamics of the Atmosphere and Ocean (3+0)					
The response of the atmosphere and ocean to mechanical 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. (Prerequisite: Graduate standing in SPAS. Next offered: 1988-89.)					
ATM 656	3 Credits				Alternate Spring
Atmospheric Circulation, Weather, and Climate (3+0)					
The circulation of the atmosphere and the weather and climate produced by that circulation. The general circulation of the atmosphere, weather systems, air-sea and air-snow interactions, circulation types and climatic anomalies, and climatic change. (Prerequisite: Graduate standing in geosciences or permission of instructor. Next offered: 1989-90.)					

## Biology

Biol. 305	4 Credits	Fall	Biol. 307	3 Credits	Fall
Invertebrate Zoology (3+3)			Parasitology (2+3)		

Biol. 308	3 Credits		Spring	Biol. 317	5 Credits		Alternate Spring
	Principles of Evolution (3+0)				Comparative Anatomy of Vertebrates (2+9)		
Biol. 328	3 Credits		Spring	Biol. 342	4 Credits		Spring
	Biology of Marine Organisms (3+0)				Microbiology (3+3)		
Biol. 361	4 Credits		Alternate Spring	Biol. 362	4 Credits		Fall
	Cell Biology (3+3)				Principles of Genetics (3+3)		
Biol. 406	4 Credits		Spring	Biol. 407	3 Credits		Alternate Spring
	Entomology (3+3)				Aquatic Entomology (2+3)		
Biol. 414	4 Credits		Alternate Fall	Biol. 418	4 Credits		Alternate Fall
	Comparative Physiology (3+3)				Developmental Biology (3+3)		
Biol. 423	4 Credits		Fall	Biol. 424	3 Credits		Alt Fall
	Ichthyology (3+3)				Biology of the Freshwater Fish of Alaska (3+0)		
Biol. 425	3 Credits		Fall	Biol. 426	3 Credits		Spring
	Mammalogy (2+3)				Ornithology (2+3)		
Biol. 441	3 Credits		Spring	Biol. 442	5 Credits		Alternate Fall
	Animal Behavior (2+3)				Bacteriology and Immunology (3+6)		
Biol. 443	3 Credits		As Dem. Wrmts.	Biol. 452	3 Credits		Alternate Spring
	Microbial Ecology (2+3)				Cytogenetics (2+3)		
Biol. 470	3 Credits		Alternate Fall	Biol. 471	3 Credits		Spring
	Ecological Genetics (2+3)				Population Ecology (3+0)		
Biol. 472	3 Credits		Fall	Biol. 473	3 Credits		Fall
	Communities and Ecosystems (3+0)				Limnology (2+3)		
Biol. 477	3 Credits		Alternate Fall	Biol. 478	2 Credits		Spring
	Water Pollution Biology (3+0)				Field Ecology (0+3)		
Biol. 479	2 Credits		Spring	Biol. 480	3 Credits		Alternate Fall
	Ornithology Field Trip (0+3)				Water Pollution Biology (3+0)		
Biol. 601	3 Credits						Alternate Spring
	Radioisotope Techniques (2+3)						
	The use of radioisotopes in tracer type applications including licensing and legal requirements under the UAF byproduct material license; radiation safety and radiation detection; assay. Emphasis will be placed on radiotracer applications in biological sciences and the analysis and interpretation of the data from these applications. (Prerequisites: Graduate standing or permission of instructor for upper division undergraduates. Next offered: 1989-90.)						
Biol. 610	2 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, microbial, 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: 1989-90.)						





Contemporary ideas and problems with the mechanics of evolution. (Prerequisites: Graduate standing or permission of instructor. Next offered: 1989-90.)

**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. 650** 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: WLF 423 and 429. Next offered: 1989-90.)

**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 either Biol. 308 or Bot. 331; graduate student standing or senior with permission of instructor. Next offered: 1989-90.)

**Biol. 680** 4 Credits Alternate Fall  
Data Analysis in Biology (3+3)

(Same as Stat. 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 discriminate 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 the student's research interests. Laboratory fee: \$10. (Prerequisites: Stat. 301, 401 and either graduate standing in a biologically oriented field or permission of instructor. Next offered: 1989-90.)

## Botany

**Botany 331** 4 Credits Spring **Botany 333** 3 Credits Alternate Fall  
Systematic Botany (2+6)  Biology of the Non-Vascular Plants  
  (2+3)

**Bot. 334** 4 Credits Alternate Fall **Bot. 416** 3 Credits Alternate Spring  
Morphology and Anatomy of Vascular  Plant Physiology (2+3)  
Plants (3+3)

**Bot. 474** 4 Credits Alternate Fall **Bot. 475** 2 Credits Alternate Fall  
Plant Ecology (3+3)  Plant Communities of Alaska-Field  
  Course(1+3)

**Bot. 476** 4 Credits Alternate Spring  
World Vegetation and Flora (3+3)

**Bot. 674** 3 Credits Alternate Spring  
Advanced Plant Ecology: Populations and Communities (2+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 1989-90.)



B.A. 436	3 Credits	Spring	B.A. 441	3 Credits	Spring
Consumer Behavior (3+0)			Promotion Management (3+0)		
B.A. 443	3 Credits	Spring	B.A. 445	3 Credits	Fall
International Marketing (3+0)			Marketing Research (3+0)		
B.A. 453	3 Credits	Fall and Spring	B.A. 456	3 Credits	Spring
Internship in Business Administration (0+var.)			Small Business Management (3+0)		
B.A. 460	3 Credits	Fall	B.A. 461	3 Credits	Spring
International Business (3+0)			International Finance (3+0)		
B.A. 462	3 Credits	Fall and Spring	B.A. 465	3 Credits	Alternate Spring
Administrative Policy (3+0)			Tourism Destination Planning and Development (3+0)		
B.A. 471	3 Credits	Alternate Spring	B.A. 475	3 Credits	As Dem. Wrmts.
Tourism Seminar (3+0)			Transportation and Logistics (3+0)		
B.A. 480	3 Credits	Spring	B.A. 483	3 Credits	Spring
Organization Theory (3+0)			Marketing Management (3+0)		
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. Computer hardware and BASIC and COBOL programming languages. Design of computer-based decisions systems. Materials fee: \$20. (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. (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 a critical review of topics such as organization functions, design parameters, contingency factors, and structural configurations. (Prerequisites: 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.)					



Chem. 331	3 Credits	Fall	Chem. 402	3 Credits	Fall
Chem. 332	3 Credits	Spring	Inorganic Chemistry (3+0)		
Physical Chemistry (3+0)					
Chem. 412	3 Credits	Spring	Chem. 433	3 Credits	Fall
Instrumental Analytical Methods (3+0)			Analytical Instrumental Laboratory (1+6)		
Chem. 434	3 Credits	Spring	Chem. 451	4 Credits	Fall
Physical Instrumental Laboratory (1+6)			General Biochemistry (4+0)		
Chem. 452	3 Credits	Spring			
Biochemistry Laboratory (1+6)					
Chem. 602	3 Credits				As Demand Warrants
Advanced Inorganic Chemistry (3+0)					
Advanced topics in inorganic chemistry. Topic Areas: solid state chemistry, bioinorganic chemistry, X-ray diffraction, thermodynamic aspects, physical methods, unusual oxidation states, etc. (Prerequisite: Chem. 402 or 431.)					
Chem. 612	3 Credits				Alternate Fall
Advanced Analytical Chemistry (3+0)					
Advanced topics in analytical chemistry. Content varies, but emphasis is on chemical equilibria and modern instrumental technique. (Prerequisite: Chem. 332. Next offered: 1989-90.)					
Chem. 621	3 Credits				As Demand Warrants
Physical Organic Chemistry (3+0)					
Application of the principles of physical chemistry to organic molecules and reactions. Topics include kinetics, thermodynamics, spectroscopy, pericyclic 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. 322. Next offered: 1989-90.)					
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: 1989-90.)					
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. 326	4 Credits	Fall and Spring	C.E. 334	3 Credits	Fall
Introduction to Geotechnical Engineering (3+3)			Properties of Materials (2+3)		
C.E. 344	3 Credits	Spring	C.E. 400	0 Credits	Fall and Spring
Water Resources Engineering (3+0)			EIT Exam		
C.E. 402	3 Credits	Fall	C.E. 403	3 Credits	Fall
Introduction to Transportation Engineering (3+0)			Traffic Engineering (2+3)		
C.E. 404	3 Credits	Spring	C.E. 412	3 Credits	Alternate Spring
Highway Engineering (2+3)			Elements of Photogrammetry (2+3)		
C.E. 415	3 Credits	Fall	C.E. 416	1 Credit	Spring
Advanced Surveying (2+3)			Boundary Surveying (1+0)		
C.E. 422	3 Credits	Spring	C.E. 425	3 Credits	Fall
Foundation Engineering (3+0)			Advanced Soil Mechanics (2+3)		
C.E. 431	3 Credits	Spring	C.E. 432	3 Credits	Fall
Structural Engineering I (3+0)			Structural Engineering II (3+0)		
C.E. 433	3 Credits	Fall	C.E. 434	3 Credits	Spring
Reinforced Concrete Design (2+3)			Timber Design (2+3)		
C.E. 436	3 Credits	Spring	C.E. 438	3 Credits	Spring
Structural Steel Design (2+3)			Design of Engineered Systems (3+0)		
C.E. 441	4 Credits	Fall	C.E. 442	3 Credits	Spring
Environmental Engineering (3+3)			Environmental Engineering II (3+0)		
C.E. 445	3 Credits	Fall	C.E. 446	3 Credits	Spring
Engineering Hydrology (2+3)			Hydraulic Engineering (2+3)		
C.E. 470	1 Credit	Fall and Spring			
Civil Engineering Internship (0+3)					
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.(Prerequisites: 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)					







**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 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: Coun. 623, 624 and three approved graduate credits in the area of specialization.)

**Computer Science**

**C.S. 301** **3 Credits** **Fall** **C.S. 302** **3 Credits** **Alternate Spring**  
**Assembly Language Programming (3+0)** **Systems Programming (3+0)**

**C.S. 311** **3 Credits** **Fall** **C.S. 321** **3 Credits** **Spring**  
**Data Structures and Algorithms (3+0)** **Operating Systems (3+0)**

**C.S. 331** **3 Credits** **Spring** **C.S. 381** **3 Credits** **Alternate Spring**  
**Programming Languages (3+0)** **Advanced Computer Graphics (3+0)**

**C.S. 401** **3 Credits** **Spring** **C.S. 411** **3 Credits** **Spring**  
**Software Engineering (3+0)** **Analysis of Algorithms (3+0)**

**C.S. 425** **3 Credits** **Alternate Fall** **C.S. 442** **3 Credits** **Alternate Fall**  
**Data Base Systems (3+0)** **Computer Communication and Networks (3+0)**

**C.S. 448** **3 Credits** **Alternate Fall** **C.S. 451** **3 Credits** **Alternate Fall**  
**System Architecture (3+0)** **Automata and Formal Languages (3+0)**

**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. (Prerequisite: Consent of C.S. graduate 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.)



---

**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)**  
A survey of the major theoretical systems of counseling and a limited practice in basic techniques. Major systems include cognitive, behavioral, psychodynamic, perceptual-phenomenal, 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 Consultation (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.)

## Economics

Econ. 321	3 Credits	Fall	Econ. 322	3 Credits	Spring
Intermediate Microeconomics (3+0)			Managerial Economics (3+0)		
Econ. 324	3 Credits	Spring	Econ. 335	3 Credits	Spring
Intermediate Macroeconomics (3+0)			Intermediate Natural Resource Economics (3+0)		
Econ. 350	3 Credits	Fall	Econ. 351	3 Credits	Alternate Fall
Money and Banking (3+0)			Public Finance (3+0)		
Econ. 409	3 Credits	As Dem. Wrmts.	Econ. 420	3 Credits	Fall
Industrial Organization and Public Policy (3+0)			Labor/Management Relations (3+0)		
Econ. 421	3 Credits	As Dem. Wrmts.	Econ. 436	3 Credits	As Dem. Wrmts.
Collective Bargaining (3+0)			Energy Economics (3+0)		
Econ. 437	3 Credits	Alternate Fall	Econ. 438	3 Credits	As Dem. Wrmts.
Regional Economic Development (3+0)			The Economics of Fisheries Management (3+0)		
Econ. 451	3 Credits	Spring	Econ. 463	3 Credits	Fall
Public Expenditure Analysis (3+0)			International Economics (3+0)		
Econ. 475	1-3 Credits	Fall and Spring			
Economic Internship					
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 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. (Prerequisite: 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. (Prerequisites: Math 162, Math 200, Math 273 or equivalent.)

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                  |  |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--|---------------|
| <b>Econ. 624</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>3 Credits</b> |  | <b>Fall</b>   |
| <b>Managerial Economics (3+0)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  |  |               |
| 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. (Prerequisites: Econ. 201 and 202; or Econ. 501; and graduate standing.) |                  |  |               |
| <b>Econ. 626</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>3 Credits</b> |  | <b>Spring</b> |
| <b>Econometrics (3+0)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |  |               |
| Introduction to econometric theory. Single equation and multiple equation system estimation, including inference and hypothesis testing and results of assumption violation. Materials fee \$20. (Prerequisites: Math 162, Math 200, Math 273 or equivalent; Stat. 301, Econ. 227 or equivalent.)                                                                                                                                                                                                                                           |                  |  |               |
| <b>Econ. 635</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>3 Credits</b> |  | <b>Fall</b>   |
| <b>Econ. 636</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>3 Credits</b> |  | <b>Spring</b> |
| <b>Resource Economics (3+0)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                  |  |               |
| The theory, methods of analysis, and current literature of natural resource economics and policy. Topics include socially optimal intertemporal use of 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 162, 200, 273 or equivalent. For Econ. 636, Econ. 635.)                                                                                                               |                  |  |               |
| <b>Econ. 670</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>0 Credits</b> |  | <b>Spring</b> |
| <b>Seminar in Research Methodology (1+0)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |  |               |
| Philosophy of research and importance of the scientific method to solution of research problems. (Prerequisite: Graduate standing.)                                                                                                                                                                                                                                                                                                                                                                                                         |                  |  |               |

---

## Education

---

- |                                                 |                  |                       |                                                        |                  |                        |
|-------------------------------------------------|------------------|-----------------------|--------------------------------------------------------|------------------|------------------------|
| <b>Ed. 303</b>                                  | <b>3 Credits</b> | <b>As Dem. Wrmts.</b> | <b>Ed. 304</b>                                         | <b>3 Credits</b> | <b>Fall and Spring</b> |
| <b>Language and Literacy Development (3+0)</b>  |                  |                       | <b>Literature for Children (3+0)</b>                   |                  |                        |
| (Same as Ling. 303)                             |                  |                       |                                                        |                  |                        |
| <b>Ed. 309</b>                                  | <b>3 Credits</b> | <b>Fall</b>           | <b>Ed. 310</b>                                         | <b>3 Credits</b> | <b>Fall and Spring</b> |
| <b>Elementary School Music Methods (3+0)</b>    |                  |                       | <b>Modes of Creative Expression in Education (3+0)</b> |                  |                        |
| (Same as Mus. 309)                              |                  |                       |                                                        |                  |                        |
| <b>Ed. 311</b>                                  | <b>2 Credits</b> | <b>Spring</b>         | <b>Ed. 330</b>                                         | <b>3 Credits</b> | <b>Fall and Spring</b> |
| <b>Audio-Visual Methods and Materials (1+3)</b> |                  |                       | <b>Diagnosis and Evaluation of Learning (3+0)</b>      |                  |                        |
| <b>Ed. 333</b>                                  | <b>3 Credits</b> | <b>As Dem. Wrmts.</b> | <b>Ed. 338</b>                                         | <b>3 Credits</b> | <b>As Dem. Wrmts.</b>  |
| <b>History of Childhood (3+0)</b>               |                  |                       | <b>Education and Economic Development (3+0)</b>        |                  |                        |
|                                                 |                  |                       | (Same as R.D. 338)                                     |                  |                        |
| <b>Ed. 345</b>                                  | <b>3 Credits</b> | <b>Fall</b>           | <b>Ed. 346</b>                                         | <b>3 Credits</b> | <b>Fall</b>            |
| <b>Sociology of Education (3+0)</b>             |                  |                       | <b>Structure of American Education (3+0)</b>           |                  |                        |
| (Same as Soc. 345)                              |                  |                       |                                                        |                  |                        |

- Ed. 350      3 Credits      Fall and Spring  
Communication in Cross-Cultural  
Classrooms (3+0)
- Ed. 380      3 Credits      Spring  
Cultural Influences in Education (3+0)
- Ed. 402      3 Credits      Fall and Spring  
Methods of Teaching in the Secondary  
School (2+3)
- Ed. 419      6 Credits      Fall and Spring  
Integrated Methods and curriculum  
Development (3+9)
- Ed. 424      3 Credits      Fall  
Small High School Programs (2+3)
- Ed. 429      3 Credits      Spring  
Microcomputer Application in the  
Classroom (2+2)
- Ed. 450      3 Credits      Spring  
Education and Cultural Transmission (3+0)
- Ed. 452      12 Credits      Fall and Spring  
Elementary Student Teaching (1+33)
- Ed. 454      12 Credits      Fall and Spring  
Student Teaching K-12 (1+33)
- Ed. 462      3 Credits      Fall  
Alaskan Environmental Education (3+0)  
(Same as A.L.R. 462)
- Ed. 473      3 Credits      Spring  
Marine Education (3+0)
- Ed. 490      3 Credits      Fall and Spring  
Curriculum Development in Cultural  
Perspective (3+0)
- Ed. 601      3 Credits      Fall  
Introduction to 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
- Ed. 375      3 Credits      Fall and Spring  
The Exceptional Learner (3+0)
- Ed. 381      3 Credits      Fall and Spring  
Foundations of Literacy Development  
(2 1/2+1 1/2)
- Ed. 407      3 Credits      Fall and Spring  
Reading Strategies for Secondary  
Teachers (3+0)
- Ed. 421      3 Credits      Fall and Spring  
Strategies for Reading and Writing  
Instruction in Multi-Cultural Classrooms  
(2 1/2+1 1/2)
- Ed. 425      3 Credits      Spring  
Community as an Educational Resource  
(2+3)
- Ed. 430      3 Credits      Fall and Spring  
Multicultural Teaching Techniques (2+3)
- Ed. 451      1-9 Credit      Fall and Spring  
Practicum in Education (0+4)
- Ed. 453      12 Credits      Fall and Spring  
Secondary Student Teaching (1+33)
- Ed. 456      3 Credits      Summer  
Orientation to Teaching in Rural Alaska  
(2+3)
- Ed. 470      3 Credits      As Dem. Wrmts.  
Human Resource Development (3+0)
- Ed. 475      3 Credits      Alternate Spring  
LOGO: A Computer Language for  
Teachers (3+0)

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 relationship between learning, thinking and perception in multicultural contexts. Particular emphasis will be on the implications of these relationships for schooling. Content will focus on cultural influences on perception, conceptual processes, learning, memory and problem solving. Content will also reflect concern for practical teaching problems. (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 a 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. (Prerequisites: Ed. 601, Ed. 610, or permission of instructor.)

**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. 618** **3 Credits** **Spring**

**Higher Education: Basic Understanding (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. 619** **3 Credits** **Spring**

**Reflective Inquiry Into Multicultural Classrooms and Communities (1+6)**

Gives student and teacher the opportunity to reflect on the classroom and community contexts. Study of behavior of adolescents and young children, cultural patterns of communication, economic and political communities, and student pathways to adult life. Should be taken concurrently with student teaching. (Prerequisite: Baccalaureate degree and admission to Teacher Education Program.)



- Ed. 620** **3 Credits** **Spring**  
**Language, Literacy and Learning (3+0)**  
 The 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/teaching strategies are also general learning/teaching strategies are 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 it 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. (Prerequisite: 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 1989-90.)
- 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. (Prerequisite: Recent 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. (Prerequisite: Graduate standing, teaching experience.)
- Ed. 651** **3 Credits** **Spring**  
**Large and Small School Management Processes (3+0)**  
 A comparative and analytical perspective of management processes used in dispersed educational organizations and in centralized educational organizations. Particular attention is given to management problems that confront Alaskan administrators. Case studies used reflect the nature of Alaskan schools. (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. 682** **3 Credits** **Late Spring/Summer**  
**Designing Learning Environments (2+3)**  
 Brings students together at conclusion of student teaching for a full week of study. Explores in depth specific problems students experienced during student teaching. Includes summer project in which students design learning environments for the classroom in which they expect to teach. (Prerequisites: Baccalaureate Degree, admission to Teacher Education Program and Completion of student teaching and Ed. 619.)

**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. (Prerequisites: Graduate standing.)

## Electrical Engineering

<b>E.E. 303</b> 4 Credits <b>Electrical Machinery (3+3)</b>	<b>Fall</b>	<b>E.E. 311</b> 3 Credits <b>Applied Engineering Electromagnetics (3+0)</b>	<b>Fall</b>
<b>E.E. 312</b> 3 Credits <b>Electromagnetic Waves and Devices (3+0)</b>	<b>Spring</b>	<b>E.E. 331</b> 1 Credit <b>High Frequency Lab (0+3)</b>	<b>Fall</b>
<b>E.E. 332</b> 1 Credit <b>Electromagnetics Laboratory (0+3)</b>	<b>Spring</b>	<b>E.E. 333</b> 4 Credits <b>Physical Electronics (3+3)</b>	<b>Fall</b>
<b>E.E. 334</b> 4 Credits <b>Electronic Circuit Design (3+3)</b>	<b>Spring</b>	<b>E.E. 341</b> 4 Credits <b>Computer Organization I (3+3)</b>	<b>Fall</b>
<b>E.E. 342</b> 4 Credits <b>Computer Organization II (3+3)</b>	<b>Spring</b>	<b>E.E. 353</b> 3 Credits <b>Circuit Theory I (3+0)</b>	<b>Fall</b>
<b>E.E. 354</b> 3 Credits <b>Engineering Signal Analysis (3+0)</b>	<b>Spring</b>	<b>E.E. 404</b> 4 Credits <b>Electrical Power Systems (3+3)</b>	<b>Spring</b>
<b>E.E. 406</b> 4 Credits <b>Electrical Power Engineering (3+3)</b>	<b>Fall</b>	<b>E.E. 434</b> 3 Credits <b>Instrumentation Systems (2+3)</b>	<b>Spring</b>
<b>E.E. 442</b> 4 Credits <b>Digital Systems Analysis and Design I (3+3)</b>	<b>Fall</b>	<b>E.E. 443</b> 4 Credits <b>Digital Systems Analysis and Design II (3+3)</b>	<b>Spring</b>
<b>E.E. 451</b> 3 Credits <b>Digital Signal Processing (2+3)</b>	<b>Fall</b>	<b>E.E. 454</b> 4 Credits <b>Advanced Digital Systems Application and Design (3+3)</b>	<b>Spring</b>
<b>E.E. 461</b> 4 Credits <b>Communication Systems (3+3)</b>	<b>Fall</b>	<b>E.E. 462</b> 4 Credits <b>Communication Systems (3+3)</b>	<b>Spring</b>
<b>E.E. 464</b> 3 Credits <b>Communication Networks (3+0)</b>	<b>Spring</b>	<b>E.E. 471</b> 4 Credits <b>Fundamentals of Automatic Control (4+0)</b>	<b>Spring</b>

E.E. 481	3 Credits	Fall	E.E. 482	3 Credits	Spring
Electronics and Instrumentation for Scientists and Engineers I (2+3)			Electronics and Instrumentation for Scientists and Engineers II (2+3)		
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 permission of instructor.)					
E.E. 604	3 Credits				As Demand Warrants
Electric Power Systems 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. (Prerequisite: E.E. 406 or permission of instructor.)					
E.E. 610	3 Credits				Alternate Fall
Linear Systems (3+0)					
Methods of representation and analysis for discrete time and continuous time. Topics include deterministic, random, continuous and discrete inputs, two sided Laplace and Z-transforms, discrete and fast Fourier transformers, and state variable theory. (Prerequisites: E.E. 354, Math. 302 or permission of instructor. Next offered: 1989-90.)					
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 or permission of instructor.)					
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 or permission of instructor.)					
E.E. 662	3 Credits				As Demand Warrants
Communication Theory (3+0)					
Generalized harmonic analysis, probability in communication systems, random variables, power spectral density, characterization of signals, sampling theory, detection, optimum filtering, coded systems, and channel models. (Prerequisite: E.E. 462 or permission of instructor.)					
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.)					

---

## Engineering Science

---

E.S. 301	3 Credits	Fall	E.S. 307	3 Credits	Fall
Engineering Analysis (3+0)			Elements of Electrical Engineering (2+3)		

E.S. 308	3 Credits	Spring	E.S. 331	3 Credits	Fall and Spring
Instrumentation and Measurement (2+3)			Mechanics of Materials (2+3)		
E.S. 334	3 Credits	Fall	E.S. 341	4 Credits	Fall and Spring
Elements of Material Science/Engineering (2+3)			Fluid Mechanics (3+3)		
E.S. 346	3 Credits	Fall and Spring	E.S. 429	3 Credit	Fall
Basic Thermodynamics (3+0)			Ethics and Liability in Professional Practice (2+3)		

---

## Engineering and Science Management

---

E.S.M. 401	Credits Arr.	Fall	E.S.M. 450	3 Credits	Spring
Construction Cost Estimating and Bid Preparation (3+0)			Economic Analysis and Operations (3+0)		
E.S.M. 601	3 Credits				Fall
Engineers in Organization (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. (Prerequisite: 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: 1989-90.)					
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. (Prerequisites: Stat. 301 and Math 202. Next offered: Fall 1989.)					
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 problems. (Not offered for credit toward the Master of Science in Engineering Management or Science Management.)

**E.S.M. 684** **3 Credits** **Spring and Fall**  
**Engineering Management Project (3+0)**

Individual study of an actual engineering management problem resulting in a report which includes recommendations for action.

## English

<p><b>Engl. 301</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Fall</b></span>  <b>Continental Literature in Translation: From the Ancient World through the Renaissance (3+0)</b></p>	<p><b>Engl. 306</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Fall</b></span>  <b>Survey of American Literature</b></p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p><b>Engl. 308</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Fall</b></span>  <b>Survey of British Literature: Beowulf to the Romantic Period (3+0)</b></p>	<p><b>Engl. 309</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Spring</b></span>  <b>Survey of British Literature: Romantic Period to the Present (3+0)</b></p>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p><b>Engl. 310</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Spring</b></span>  <b>Literary Criticism (3+0)</b></p>	<p><b>Engl. 313</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Spring</b></span>  <b>Writing Non-fiction Prose (3+0)</b></p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p><b>Engl. 314</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Fall and Spring</b></span>  <b>Technical Writing</b></p>	<p><b>Engl. 318</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Fall and Spring</b></span>  <b>Modern English Grammar (3+0)</b></p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p><b>Engl. 340</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Fall</b></span>  <b>Contemporary Native American Literature (3+0)</b></p>	<p><b>Engl. 349</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Fall</b></span>  <b>Narrative Art of Alaska Native Peoples (in English Translation) (3+0)</b></p>
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p><b>Engl. 350</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Alternate Fall</b></span>  <b>Literature of Alaska and the Yukon Territory (3+0)</b></p>	<p><b>Engl. 371</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Fall and Spring</b></span>  <b>Intermediate Creative Writing (3+0)</b></p>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p><b>Engl. 403</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Every Third Spring</b></span>  <b>American Renaissance (3+0)</b></p>	<p><b>Engl. 404</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Every Third Spring</b></span>  <b>American Realism (3+0)</b></p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p><b>Engl. 405</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Every Third Fall</b></span>  <b>British Writers of the 19th Century: Romantic Period (3+0)</b></p>	<p><b>Engl. 406</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Every Third Fall</b></span>  <b>British Writers of the 19th Century: Victorian Period (3+0)</b></p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p><b>Engl. 407</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Every Third Fall</b></span>  <b>British Writers of the Restoration and 18th Century: Neo-Classical Period (3+0)</b></p>	<p><b>Engl. 408</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Every Third Spring</b></span>  <b>American Origins (3+0)</b></p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p><b>Engl. 414</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Fall</b></span>  <b>Research Writing (3+0)</b></p>	<p><b>Engl. 421</b> <span style="margin-left: 20px;"><b>3 Credits</b></span> <span style="float: right;"><b>Every Third Spring</b></span>  <b>Chaucer (3+0)</b></p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------

- Engl. 422 3 Credits Fall  
Shakespeare: History Plays and Tragedies (3+0)
- Engl. 425 3 Credits Spring  
Shakespeare: Comedies and Non-Dramatic Poetry (3+0)
- Engl. 426 3 Credits Every Third Fall  
Milton (3+0)
- Engl. 444 3 Credits Every Third Spring  
Fiction in Translation(3+0)
- Engl. 445 3 Credits Alternate Fall  
20th-Century Drama: From Chekhov to Ionesco (3+0)
- Engl. 446 3 Credits Alternate Spring  
Major Modern and Contemporary Poetry (3+0)
- Engl. 447 3 Credits Alternate Spring  
20th-Century British Prose (3+0)
- Engl. 448 3 Credits Alternate Spring  
20th-Century American Prose (3+0)
- Engl. 452 3 Credits Every Third Fall  
The British Novel to 1900 (3+0)
- Engl. 462 3 Credits Alternate Spring  
Applied English Linguistics (3+0)
- Engl. 472 3 Credits Alternate Spring  
History of the English Language (3+0)
- Engl. 485 3 Credits Spring  
Teaching Compositions in the Schools (3+0)
- 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: 1990-91.)
- 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.)

<b>Engl. 671</b>	<b>Credits Arr.</b>	<b>Fall and Spring</b>
<b>Writers' Workshop</b>		
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: At least two courses from among Engl. 481, 482, 483, 484 and permission of instructor, or, permission of the head of the Department of English and the instructor.)		
<b>Engl. 681</b>	<b>3 Credits</b>	<b>Alternate Fall</b>
<b>Forms of Poetry (3+0)</b>		
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: 1989-90.)		
<b>Engl. 682</b>	<b>3 Credits</b>	<b>Alternate Fall</b>
<b>Forms of Fiction (3+0)</b>		
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 Standing or permission of instructor. Next offered: 1988-89.)		
<b>Engl. 683</b>	<b>3 Credits</b>	<b>As Demand Warrants</b>
<b>Forms of Drama (3+0)</b>		
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 standing or permission of instructor.)		
<b>Engl. 684</b>	<b>3 Credits</b>	<b>Alternate Spring</b>
<b>Forms of Non-Fiction Prose (3+0)</b>		
Intensive study of the forms and techniques of non-fiction. Includes readings and writing exercises. (Prerequisite: Graduate Standing or permission of instructor. Next offered: 1989-90.)		
<b>Engl. 685</b>	<b>3 Credits</b>	<b>Fall</b>
<b>Teaching College Composition (3+0)</b>		
An investigation into current practice and theory with demonstrations and reports on pedagogy. Required of all teaching assistants in English. (Prerequisite: Graduate standing.)		
<b>Engl. 692</b>	<b>Credits Arr.</b>	<b>Fall and Spring</b>
<b>Graduate Seminar</b>		
Intensive study of selected topics in the discipline.		

---

## Environmental Quality Engineering/Science

---

<b>EQE 601</b>	<b>3 Credits</b>	<b>Every Third Semester</b>
<b>Environmental Quality Science Measurements (2+3)</b>		
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. (Prerequisite: Permission of instructor. Next offered: Fall 1989.)		
<b>EQE 602</b>	<b>3 Credits</b>	<b>Every Third Semester</b>
<b>Engineering Management of Water Quality (3+0)</b>		
Concepts, rationale, theory, institutions, and engineering aspects of water quality management. Methods of water quality management: low flow augmentation, in-stream aeration, stream and estuarine analysis, ocean disposal systems, land disposal, control of thermal effluents, industrial discharges, and arctic applications. Materials fee: \$10. (Prerequisite: Permission of instructor. Next offered: Fall 1989.)		



- 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 human beings and the environment. Identification and location of sources, and measurement of quality and standards. Materials fee: \$15. (Prerequisite: Permission of instructor. Next offered: Fall 1988.)
- EQE 604** 3 Credits Every Third Semester  
**Environmental Quality Evaluation (3+0)**  
 Topics of environmental impact statements, environmental law (local, state and federal), and environmental quality. Impact from projects of mining, highways, airports, pipelines, industrial development, water, wastewater and solid waste, and others - theoretical considerations and case studies. (Prerequisite: Graduate standing or permission of the instructor. Next offered: Spring 1989.)
- 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 instructor. Next offered: Spring 1989.)
- 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: Fall 1989.)
- EQE 607** 3 Credits Alternate Spring  
**Blotechnology (3+0)**  
 (Same as ALR 607)  
 Theory and application of bioconversion and bioengineering processes for foods, agriculture, pharmaceuticals, and industrial chemicals. The use of microbiological methods (recombinant DNA, immobilized enzymes and cells, hybridomas, and mutation and selection) for the production of conventional bioproducts and in the development of new bioproducts. (Prerequisites: Biol. 442 and Chem. 322. Next offered: 1989-90.)

## Eskimo

- Esk. 301** 3 Credits Fall  
**Advanced Yup'ik Eskimo (3+0)**
- Esk. 415** 3 Credits Spring  
**Additional Topics in Advanced Yup'ik Eskimo (3+0)**
- Esk. 417** 3 Credits Spring  
**Advanced Inupiaq Eskimo (3+0)**

## Fisheries

- FISH 411** Credits Arr. As Dem. Wrmts. Fall  
**Fisheries Field Trip**
- FISH 429** 3 Credits Fall  
**Introduction to Fisheries Science (2+3)**

FISH 430 3 Credits Spring  
Fisheries Management (3+0)

FISH 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: Stat. 301 and WLF 429 or equivalents or permission of instructor. Next offered: 1988-89.)

## French

Fren. 301 3 Credits Alternate Fall  
Fren. 303 3 Credits Alternate Fall  
Advanced French (3+0)

Fren. 387 2 Credits Alternate Fall  
Individual Study: Semantics

Fren. 432 3 Credits Spring  
Studies in French Literature and  
Culture (3+0)

Fren. 487 2 Credits Alternate Fall  
Individual Study: Translation of French  
Texts

Fren. 488 3 Credits As Dem. Wrmts.  
Individual Study: Senior Project

## Geography

Geog. 301 3 Credits Alternate Fall Spring  
Geographic Field Research Techniques

Geog. 302 3 Credits Spring  
Geography of Alaska (3+0)

Geog. 305 3 Credits Alternate Fall  
Geography of Europe (except U.S.S.R.)  
(3+0)

Geog. 306 3 Credits Alternate Spring  
Geography of the Soviet Union (3+0)

Geog. 309 3 Credits Alternate Spring  
Cartography (1+6)

Geog. 311 3 Credits Alternate Fall  
Geography of Asia (3+0)

Geog. 315 3 Credits As Dem. Wrmts.  
Geography of Africa (3+0)

Geog. 327 3 Credits Spring  
Cold Lands (3+0)

Geog. 339 3 or 4 Credits Spring  
Advanced Physical Geography (3+0) or  
(3+3)

Geog. 401 3 Credits Alternate Fall  
Weather and Climate (3+0)

Geog. 402 3 Credits Alternate Fall  
Man and Nature (3+0)

Geog. 404 3 Credits Alternate Fall  
Urban Geography (3+0)

Geog. 405 3 Credits Alternate Fall  
Political Geography (3+0)

Geog. 408 3 Credits Alternate Spring  
Quantitative Research Techniques (2+3)

## Geological Engineering

G.E. 365	3 Credits	Fall	G.E. 372	3 Credits	Spring
Geological Engineering I (3+0)			Rock Engineering (3+0)		
G.E. 375	3 Credits	Fall	G.E. 405	4 Credits	Spring
Terrain Analysis (3+0)			Exploration Geophysics (3+3)		
G.E. 420	3 Credits	Spring	G.E. 431	3 Credits	Alternate Fall
Subsurface Hydrology (2+3)			Applied Ore Microscopy (1+3)		
G.E. 435	3 Credits	Spring	G.E. 440	3 Credits	Alternate Spring
Exploration Design (3+0)			Slope Stability (3+0)		
G.E. 471	3 Credits	Spring	G.E. 480	2 Credits	Spring
Remote Sensing for Engineering (3+0)			Geological Engineering II (1+3)		
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. (Prerequisite: 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. (Prerequisite: 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, Stat. 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
Tunnelling Geotechniques (3+0)					
Tunnel design, case histories, student report. (Prerequisites: Graduate standing in geological engineering or permission of instructor. Next offered: 1988-89.)					

G.E. 671 3 Credits Alternate Spring

**Engineering Application of Digital Image Processing (2+3)**

Quantitative methods of utilizing digital image processing and engineering information system. Applications include, but are not limited to, evaluation of the engineering properties of geo-materials, characterization of joint surface conditions, enhancement of photoelastic stress patterns, and identification of critical slope failure surfaces. (Prerequisite: G.E. 471 or equivalent or permission of instructor. Next offered: 1988-89.)

G.E. 675 3 Credits Alternate Fall

**Applied Mining Geology (3+0)**

The course will cover a wide range of investigative procedures involved in mining geology from the preproduction to terminal phases for an operation. Diverse mining models from the open-pit to deep-level underground operations will be examined and attention focused on the methodologies of mapping, sampling, on-going evaluation, and geotechnical aspects in relation to water and strata control hazards. Problem solving of case history type situations in which geological influences are evident will be stressed. (Prerequisites: Graduate standing or permission of instructor. Geos. 407 and G.E. 435 recommended. Next offered: 1989-90.)

**Geoscience (Geology and Geophysics)**

Geos. 302	3 Credits	Alternate Spring	Geos. 304	3 Credits	Fall
	Marine Geology (3+0)			Geomorphology (3+0)	
Geos. 314	4 Credits	Spring	Geos. 316	4 Credits	Fall
	Structural Geology (3+3)			Optical Mineralogy and Petrography (2+6)	
Geos. 321	3 Credits	Fall	Geos. 322	4 Credits	Spring
	Sedimentology (2+3)			Stratigraphic Principles (3+3)	
Geos. 350	2 Credits	Spring	Geos. 351	4 or 6 Credits	Summer
	Geologic Field Methods (1+3)			Field Geology (Arranged)	
Geos. 370	4 Credits	Spring	Geos. 401	4 Credits	Fall
	Sedimentary and Structural Geology for Petroleum Engineers (3+3)			Invertebrate Paleontology (3+3)	
Geos. 408	2 Credits	Spring	Geos. 410	2 Credits	Fall
	Photogeology (1+3)			Potential Methods in Geophysics (1+3)	
Geos. 411	3 Credits	Spring	Geos. 412	2 Credits	Fall
	Seismic Exploration (2+3)			Electrical Methods in Geophysics (1+3)	
Geos. 414	3 Credits	Alternate Fall	Geos. 417	3 Credits	Fall
	Introduction to Glaciology (3+0)			Introduction to Geochemistry (3+0)	
Geos. 418	3 Credits	Fall	Geos. 419	4 Credits	Alternate Spring
	Basic Geophysics (3+0)			Continuum Mechanics (4+0)	
Geos. 420	4 Credits	Alternate Fall	Geos. 422	3 Credits	Fall
	Elements of Seismology (3+3)			Geoscience Applications of Remote Sensing (3+0)	
Geos. 430	3 Credits	Spring	Geos. 432	3 Credits	Fall
	Statistics and Data Analysis in Geology (3+0)			Geology of Mineral Resources (3+0)	

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                       |                                                                                                        |                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------|---------------------------|
| <p><b>Geos. 432L</b>    2 Credits<br/> <b>Geology of Mineral Resources Laboratory (1+3)</b></p>                                                                                                                                                                                                                                                                                                                                                                     | <p>Fall</p>           | <p><b>Geos. 451</b>    2 Credits<br/> <b>Practical Field Geophysics</b></p>                            | <p>Summer</p>             |
| <p><b>Geos. 462</b>    4 Credits<br/> <b>Glacial and Periglacial Geology (3+3)</b></p>                                                                                                                                                                                                                                                                                                                                                                              | <p>Alternate Fall</p> | <p><b>Geos. 465</b>    3 Credits<br/> <b>Geoarchaeology (3+0)</b><br/>         (Same as Anth. 465)</p> | <p>Alternate Spring</p>   |
| <p><b>Geos. 470</b>    3 Credits<br/> <b>Petroleum Geology (3+3)</b></p>                                                                                                                                                                                                                                                                                                                                                                                            | <p>Alternate Fall</p> | <p><b>Geos. 482</b>    1 Credit<br/> <b>Geology Seminar (1+0)</b></p>                                  | <p>Fall and Spring</p>    |
| <p><b>Geos. 601</b><br/> <b>Scanning Electron Microscopy (1/2+1)</b><br/>         The theory and use of the scanning electron microscope. Each student will prepare their 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. (Prerequisite: Graduate standing and permission of instructor.)</p>             | <p>1 Credit</p>       |                                                                                                        | <p>Spring</p>             |
| <p><b>Geos. 605</b><br/> <b>Geochronology (3+0)</b><br/>         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. (Prerequisite: Graduate standing or permission of instructor.)</p>                                                                                              | <p>3 Credits</p>      |                                                                                                        | <p>Spring</p>             |
| <p><b>Geos. 606</b><br/> <b>Volcanology (2+0)</b><br/>         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.)</p> | <p>2 Credits</p>      |                                                                                                        | <p>Spring</p>             |
| <p><b>Geos. 607</b><br/> <b>Advanced Paleomagnetism (1+3)</b><br/>         An advanced course in the theory and practice of paleomagnetism including the basic magnetic properties of rocks, paleomagnetic techniques, and interpretation of paleomagnetic data. (Prerequisite: Senior or graduate standing.)</p>                                                                                                                                                   | <p>2 Credits</p>      |                                                                                                        | <p>Spring</p>             |
| <p><b>Geos. 608</b><br/> <b>Advanced Exploration Geophysics (2-4+0)</b><br/>         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.)</p>                                                                                                                                          | <p>2-4 Credits</p>    |                                                                                                        | <p>As Demand Warrants</p> |
| <p><b>Geos. 609</b><br/> <b>Advanced Geomorphology (2-4+0-3)</b><br/>         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.)</p>        | <p>2-4 Credits</p>    |                                                                                                        | <p>Fall and Spring</p>    |
| <p><b>Geos. 610</b><br/> <b>Advanced Seismology (3+0)</b><br/>         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: 1989-90.)</p>                                         | <p>3 Credits</p>      |                                                                                                        | <p>Alternate Spring</p>   |
| <p><b>Geos. 611</b><br/> <b>Tectonics and Sedimentation (3+0)</b><br/>         A survey of sedimentary basins in various plate-tectonic settings. Emphasis on the evolution of sedimentary basins, tectonic settings as reflected in sandstone composition, and techniques of basin analysis. (Prerequisites: Geos. 402 or permission of instructor. Next offered: 1989-90.)</p>                                                                                    | <p>3 Credits</p>      |                                                                                                        | <p>Alternate Fall</p>     |

- Geos. 612**                      **3 Credits**                                      **Fall**  
**Geologic Evolution of Alaska (3+0)**  
An overview of the geological provinces of Alaska and neighboring continental and oceanic regions. Emphasis will be on the geologic history and tectonic evolution of Alaska. (Prerequisites: Geos. 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: 1989-90.)
- 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: 1989-90.)
- 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 contained, and their role in engineering hydrology. (Prerequisite: Permission of instructor. Next offered: 1989-90.)
- 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 and 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. (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 and 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. 625**                      **3 Credits**                                      **Fall**  
**Mountain Belts of the World (3+0)**  
Characteristics and evolution of mountain belts throughout the world. Geologic processes important in the evolution and architecture of mountain belts will be examined first, including plate tectonics, deformation, magmatism, metamorphism, and sedimentation. Then well-documented examples of mountain belts will be studied to illustrate the similarities and variations in the world's mountain belts. (Prerequisites: Geos. 314, Geos. 624C or equivalents. Instructor permission required. Next offered: 1988-89.)



carbonate platforms, (C) deep-water carbonates, and (D) dolomitization and diagenesis. (Prerequisite: Course in carbonate sedimentology or permission of instructor. Next offered: 1989-90.)

**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. (Prerequisite: Graduate standing or permission of instructor. 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 application 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. (Prerequisite: Geos. 101 and 304 desirable, but not required. Next offered: 1989-90.)

**Geos. 650** **3 Credits** **Alternate Fall**  
**Paleocology of Beringia**

Reconstruction of landscape, climate, biota and ecology of Beringia between 40,000 and 8,000 years ago through literature surveys. (Prerequisite: Permission of instructor. Next offered: 1989-90)

## German

<b>Ger. 301</b>	<b>3 Credits</b>	<b>Alternate Fall</b>	<b>Ger. 387</b>	<b>2 Credits</b>	<b>Fall</b>
<b>Ger. 303</b>	<b>3 Credits</b>	<b>Alternate Fall</b>	<b>Individual Study: Semantics</b>		
<b>Advanced German (3+0)</b>					

<b>Ger. 432</b>	<b>3 Credits</b>	<b>Alternate Spring</b>	<b>Ger. 487</b>	<b>2 Credits</b>	<b>Alternate Fall</b>
<b>Studies in German Literature and Culture (3+0)</b>			<b>Individual Study: Translation of German Texts</b>		

<b>Ger. 488</b>	<b>3 Credits</b>	<b>As Dem. Wrmts.</b>
<b>Individual Study: Senior Project</b>		

## History



Hist. 305	3 Credits	Alternate Fall	Hist. 306	3 Credits	Alternate Spring
Europe: 1789 to 1850 (3+0)			Europe: 1850 to 1900 (3+0)		
Hist. 315	3 Credits	Alternate Fall	Hist. 316	3 Credits	Alternate Spring
Europe: 1900-1945 (3+0)			Europe since 1945 (3+0)		
Hist. 320	3 Credits	Every Third Spring	Hist. 330	3 Credits	Alternate Fall
Modern Scandinavia (3+0)			Modern China (3+0)		
Hist. 331	3 Credits	Alternate Spring	Hist. 341	3 Credits	Fall
Modern Japan (3+0)			History of Alaska (3+0)		
Hist. 344	3 Credits	Every Third Spring	Hist. 350	3 Credits	Alternate Spring
Modern Russia (3+0)			History of the People's Republic of China (3+0)		
Hist. 354	3 Credits	Alternate Fall	Hist. 355	3 Credits	Alternate Spring
Canadian History to 1867 (3+0)			Canadian History: 1867 to present (3+0)		
Hist. 375	3 Credits	Alternate Fall	Hist. 380	3 Credits	Alternate Spring
History of the Northern Pacific (3+0)			Polar Exploration and its Literature (3+0)		
Hist. 401	3 Credits	Every Third Fall	Hist. 402	3 Credits	Every Third Fall
Renaissance and Reformation Europe (3+0)			Seventeenth and Eighteenth Century Europe (3+0)		
Hist. 403	3 Credits	Every Third Fall	Hist. 405	3 Credits	Alternate Fall
The French Revolution and Napoleon (3+0)			Modern Germany (3+0)		
Hist. 420	3 Credits	Every Third Spring	Hist. 430	3 Credits	Alternate Fall
Approaches to Women's History (3+0)			American Colonial History (3+0)		
Hist. 435	3 Credits	Alternate Spring	Hist. 440	3 Credits	Alternate Fall
Civil War and Reconstruction (3+0)			U.S. Westward Expansion 1763-1867 (3+0)		
Hist. 441	3 Credits	Alternate Spring	Hist. 450	3 Credits	Alternate Spring
The Development of the American and Canadian West 1867-Present (3+0)			Twentieth Century America (3+0)		
Hist. 455	3 Credits	Alternate Fall	Hist. 475	3 Credits	Fall
Military History (3+0)			Hist. 476	3 Credits	Spring
Hist. 484	Credits Arr.	Alternate Spring	Historiography and Historical Method (3+0)		
Seminar in Northern Studies			Hist. 490	3 Credits	Alternate Spring
			Researching and Writing Academic and Public Northern History (1+2)		

## Human Services

HMSV 330	3 Credits	Spring	HMSV 351	3 Credits	Spring
Alcoholism: Treatment and Prevention			Foundations of Counselling II (3+0) (Same as Psy. 356)		

HMSV 410	3 Credits	Fall	HMSV 415	3 Credits	Spring
Management of Human Services Programs (3+0)			Group Processes (3+0)		

HMSV 445	3 Credits	Fall	HMSV 488	6 Credits	Fall and Spring
Community Psychology (3+0) (Same as Psy. 445)			Practicum in Human Services		

---

## Humanities

Hum. 329	3 Credits	Alternate Fall	Hum. 332	3 Credits	Alternate Spring
The Modern Media: Search for Communication (3+0)			Varieties of Visual Expression: Art as Image and Idea (3+0)		

Hum. 342	3 Credits	Alternate Spring	Hum. 411	3 Credits	Alternate Fall
Synthesis in Musical Expression (3+0)			Dimensions of Literature (3+0)		

Hum. 492	3 Credits	Alternate Spring
Senior Seminar (3+0)		

---

## Japanese

Jpn. 301	3 Credits	Fall	Jpn. 332	3 Credits	Alternate Spring
Jpn. 302	3 Credits	Spring	Japanese Cultural Traditions (3+0)		
Advanced Japanese (3+0)					

Jpn. 333	3 Credits	Alternate Fall
Twentieth Century Japanese Prose Fiction (3+0)		

---

## Journalism -- Broadcasting

J-B 301	4 Credits	Spring	J-B 303	3 Credits	Spring
Basic Newsgathering and Processing (2+4)			Intermediate Photography (2+3)		

J-B 311	3 Credits	Fall and Spring	J-B 316	3 Credits	Fall
Magazine Article Writing (2+1)			Television Production (2+4)		

J-B 317	3 Credits	Spring	J-B 320	3 Credits	Spring
Broadcast Journalism (3+0)			Journalism in Perspective (3+0)		

J-B 323	3 Credits	Fall	J-B 324	3 Credits	Spring
Magazine Editing (3+0)			Typography and Publication Design (2+2)		

J-B 326	3 Credits	Spring	J-B 340	3 Credits	Fall
Principles of Advertising (3+0) (Same as B.A. 326)			Approaches to the Study of Mass Communication (3+0)		

J-B 372	3 Credits	Alternate Fall	J-B 400	3 Credits	Fall and Spring
Methods of Instructional Broadcasting (3+0)			Advanced Media Practicum (1+6)		
J-B 402	3 Credits	Fall and Spring	J-B 407	3 Credits	Spring
Advanced Photography (2+3)			Programming and Production (3+0)		
J-B 411	3 Credits	Fall and Spring	J-B 413	3 Credits	Fall
Advanced Writing for Publication (3+0)			Mass Media Law and Regulations (3+0)		
J-B 415	3 Credits	Fall	J-B 416	3 Credits	Alternate Fall
News/Documentary Television Production (2+2)			Advanced Broadcast Production (1+6)		
J-B 424	3 Credits	Spring	J-B 433	3 Credits	Fall
Magazine Production (2+3)			Public Relations (3+0)		
J-B 444	4 Credits	Fall and Spring			
Advanced Newsgathering and Processing (2+4)					

## Justice

Just. 303	3 Credits	Fall	Just. 310	3 Credits	Spring
Introduction to Legal Processes (3+0) (Same as P.S. 303)			Principles of Corrections (3+0)		
Just. 320	Var. Credit	Fall and Spring	Just. 330	3 Credits	Spring
Practicum			Law and Society (3+0) (Same as P.S. 330)		
Just. 352	3 Credits	Fall	Just. 354	3 Credits	Spring
Criminal Law (3+0)			Procedural Law (3+0)		
Just. 404	3 Credits	Spring	Just. 451	3 Credits	Fall
Introduction to Legal Research and Writing (3+0) (Same as P.S. 404)			Research Methods (3+0)		
Just. 452	3 Credits	Spring	Just. 460	3 Credits	Fall
Comparative Criminal Justice (3+0)			Justice Processes (3+0)		
Just. 475	3 Credits	Fall and Spring	Just. 492	Var. Credit	Fall and Spring
Internship			Seminar		

## Library Science

L.S. 307	1 Credit	Spring	L.S. 309	1 Credit	As Dem. Wrmts.
Information Sources for Educators (1+0)			Information Resources		

## Linguistics

Ling. 303	3 Credits	As Dem. Wrmts.	Ling. 318	3 Credits	Alternate Spring
Language and Literacy Development			Introduction to Phonetics and		
(3+0)			Phonology (3+0)		
(Same as Ed. 303)					
Ling. 320	3 Credits	Alternate Spring	Ling. 350	3 Credits	Alternate Fall
Introduction to Syntactic Theory (3+0)			Historical Linguistics (3+0)		
Ling. 410	3 Credits	Alternate Fall	Ling. 450	3 Credits	Every third Spring
Theory and Methods of Second			Language Policy and Planning (3+0)		
Language Teaching (3+0)					
Ling. 482	3 credits	Every Third Year			
Seminar in Linguistics (3+0)					

## Marine Science and Limnology

MSL 411	3 Credits	Alternate Fall	MSL 435	3 Credits	Alternate Fall
Current Topics in Oceanographic			Acoustical Oceanography (3+0)		
Research (3+0)					
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. The basic biology and adaptations of selected species of zooplankton and nekton. The benthos -- shore biota, shelf and deepsea organisms: basic biology, tropic 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 own choosing. Five-week course offered at the Seward Marine Center. (Prerequisites: Graduate standing or permission of 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 instructor. Next offered: 1989-90.)					
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 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: 1989-90)					
MSL 622	3 Credits				Alternate Fall
Satellite Oceanography (3+0)					



<b>MSL 661</b>	<b>2 Credits</b>	<b>Alternate Spring</b>
<b>Isotope Techniques for Aquatic Science (2+0)</b>		
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: 1989-90.)		
<b>MSL 662</b>	<b>3 Credits</b>	<b>Alternate Spring</b>
<b>Fjord Oceanography (3+0)</b>		
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: 1989-90.)		
<b>MSL 665</b>	<b>3 Credits</b>	<b>Alternate Spring</b>
<b>Microbial Biochemistry (2+3)</b>		
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.)		
<b>MSL 670</b>	<b>2 Credits</b>	<b>Alternate Fall</b>
<b>Nutrient Dynamics (2+0)</b>		
The dynamics of nitrogen, phosphorus and silicon cycles of the world oceans and the specific processes which transfer nutrients between ecosystems compartments will be studied. Analytical techniques employed in measurement of nutrient transfer rates will also be studied. (Prerequisites: MSL 660 or 650 or permission of instructor.)		
<b>MSL 680</b>	<b>3 Credits</b>	<b>Alternate Spring</b>
<b>Physical-Chemical Limnology (3+0)</b>		
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: 1989-90.)		

## Mathematics

<b>Math. 302</b>	<b>3 Credits</b>	<b>Fall and Spring</b>	<b>Math. 305</b>	<b>3 Credits</b>	<b>As Dem. Wrmts.</b>
<b>Differential Equations (3+0)</b>			<b>Geometry (3+0)</b>		
<b>Math. 306</b>	<b>3 Credits</b>	<b>Alternate Spring</b>	<b>Math. 307</b>	<b>3 Credits</b>	<b>Fall</b>
<b>Introduction to the History and Philosophy of Mathematics (3+0)</b>			<b>Discrete Mathematics (3+0)</b>		
<b>Math. 308</b>	<b>3 Credits</b>	<b>Spring</b>	<b>Math. 310</b>	<b>3 Credits</b>	<b>Fall</b>
<b>Abstract Algebra (3+0)</b>			<b>Numerical Analysis (3+0)</b>		
<b>Math. 314</b>	<b>3 Credits</b>	<b>Spring</b>	<b>Math. 371</b>	<b>3 Credits</b>	<b>As Dem. Wrmts.</b>
<b>Linear Algebra (3+0)</b>			<b>Probability (3+0)</b>		
<b>Math. 401</b>	<b>3 Credits</b>	<b>Fall</b>	<b>Math. 404</b>	<b>3 Credits</b>	<b>As Dem. Wrmts.</b>
<b>Math. 402</b>	<b>3 Credits</b>	<b>Spring</b>	<b>Topology (3+0)</b>		
<b>Advanced Calculus (3+0)</b>					
<b>Math. 408</b>	<b>3 Credits</b>	<b>As Dem. Wrmts.</b>	<b>Math. 421</b>	<b>4 Credits</b>	<b>Fall</b>
<b>Mathematical Statistics (3+0)</b>			<b>Applied Analysis I (4+0)</b>		

- Math. 422**      4 Credits      Spring      **Math. 423**      3 Credits      As Dem. Wmts.  
Applied Analysis II (4+0)      Applied Mathematics (3+0)
- Math. 460**      3 Credits      Fall  
Mathematical Modeling (3+0)
- Math. 603**      3 Credits      Fall  
Real and Complex Analysis I (3+0)  
General theory of measurement 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 instructor's 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: 1989-90.)
- Math. 615**      3 Credits      Alternate Spring  
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. Next offered: 1988-89.)
- 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, 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. (Prerequisite: 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.)

<b>Math. 631</b>	<b>3 Credits</b>	<b>Spring</b>
<b>Theory of Modern Algebra (3+0)</b>		
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.)		
<b>Math. 651</b>	<b>3 Credits</b>	<b>Every Third Year</b>
<b>Topology (3+0)</b>		
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.)		
<b>Math. 660</b>	<b>3 Credits</b>	<b>Alternate Spring</b>
<b>Advanced Mathematical Modeling (3+0)</b>		
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. (Prerequisite: Consent of instructor. Next offered: 1988-89.)		
<b>Math. 661</b>	<b>3 Credits</b>	<b>As Demand Warrants</b>
<b>Optimization (3+0)</b> (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.)		
<b>Math. 663</b>	<b>3 Credits</b>	<b>Alternate Spring</b>
<b>Applied Combinatorics and Graph Theory (3+0)</b>		
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. (Prerequisite: Consent of instructor. Next offered: 1989-90.)		

## Mechanical Engineering

<b>M.E. 302</b>	<b>4 Credits</b>	<b>Spring</b>	<b>M.E. 313</b>	<b>Credits</b>	<b>Spring</b>
<b>Mechanical Design (3+3)</b>			<b>Mechanical Engineering Thermodynamics (3+0)</b>		
<b>M.E. 321</b>	<b>3 Credits</b>	<b>Fall</b>	<b>M.E. 403</b>	<b>4 Credits</b>	<b>Fall</b>
<b>Industrial Processes (2+3)</b>			<b>Mechanical Design II (3+2)</b>		
<b>M.E. 404</b>	<b>3 Credits</b>	<b>Spring</b>	<b>M.E. 408</b>	<b>3 Credits</b>	<b>Spring</b>
<b>Stress Analysis (3+0)</b>			<b>Dynamics of Systems (2+2)</b>		
<b>M.E. 409</b>	<b>3 Credits</b>	<b>Spring</b>	<b>M.E. 414</b>	<b>3 Credits</b>	<b>Fall</b>
<b>Controls (2+2)</b>			<b>Thermal Systems Design (3+0)</b>		
<b>M.E. 415</b>	<b>2 Credits</b>	<b>Fall</b>	<b>M.E. 416</b>	<b>3 Credits</b>	<b>Fall</b>
<b>Thermal Systems Laboratory (1+3)</b>			<b>Design of Mechanical Equipment for the Petroleum Industry (3+0)</b>		
<b>M.E. 441</b>	<b>3 Credits</b>	<b>Spring</b>	<b>M.E. 450</b>	<b>3 Credits</b>	<b>As Dem. Wrmts.</b>
<b>Heat and Mass Transfer (3+0)</b>			<b>Theory of Flight (3+0)</b>		



- M.E. 464**      3 Credits      Spring      **M.E. 487**      3 Credits      Spring  
Corrosion Engineering (3+0)      Design Project
- M.E. 601**      3 Credits      Alternate Fall  
**Finite Element Analysis in Engineering (3+0)**  
Formulation of the finite element method. Applications to problems of engineering in solid mechanics, fluid mechanics, and heat transfer. Use and development of codes for computer solution of problems. (Prerequisites: Graduate standing in engineering, ES 201 and Math. 302 or equivalent. Next offered: 1989-90.)
- 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. (Prerequisite: Graduate standing in engineering. Next offered: 1989-90.)
- M.E. 617**      3 Credits      As Demand Warrants  
**Power Analysis (3+0)**  
Fundamentals of power generation including piping, pumps, fuels and combustion, steam generators, condensers, deaerators, evaporators, feedwater treatment and heating, regeneration, fuel handling, heat balance, equipment, economics, and plant layout. (Prerequisite: M.E. 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: 1989-90.)
- 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: 1989-90.)
- 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. (Prerequisite: Graduate standing in engineering. Next offered: 1989-90.)
- 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. (Prerequisite: 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: 1989-90.)
- 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. 300	1 Credit	Fall and Spring	Mils. 301	3 Credits	Spring
	Outdoor Skills Laboratory (0+2)			Theory and Dynamics of Tactical Operations (3+1)	
Mils. 303	3 Credits	Fall	Mils. 350	3 Credits	Summer
	Advanced Leadership (3+1) (Same as B.A. 303)			Advanced Camp	
Mils. 351	2 Credits	Summer	Mils. 400	1 Credit	Fall and Spring
	Cadet Troop Leadership Training			Outdoor Skills Laboratory (0+2)	
Mils. 401	3 Credits	Fall	Mils. 402	3 Credits	Spring
	Seminar on Tactical Operations (3+1)			Seminar in Leadership and Management (3+0)	

## Mineral Preparation Engineering

M.Pr. 304	3 Credits	Alternate Fall	M.Pr. 313	3 Credits	Alternate Fall
	Introduction to Metallurgy (3+0)			Introduction to Mineral Preparation (2+3)	
M.Pr. 314	3 Credits	Alternate Spring	M.Pr. 410	3 Credits	Alternate Fall
	Unit Preparation Processes (1+6)			Surface Materials Handling Systems (2+3)	
M.Pr. 418	3 Credits	Spring	M.Pr. 433	3 Credits	Alternate Fall
	Emission Spectroscopy, X-Ray Spectroscopy, and Atomic Absorption (2+3)			Coal Preparation (2+3)	
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, including such research subjects as magnetic susceptibility, dielectric constants, and electrical conductivity of minerals; chemical theory and mechanism of bubble contact in flotation, and the effect of ultrasonic vibration in unit processes. (Admission by arrangement.)				
M.Pr. 688	1 Credit	Fall			
	Graduate Seminar I (1+0) (Same as Min. 688)				
	Preparation and presentation of research outlines by graduate students and participation in regularly organized Mineral Engineering department seminars. (Prerequisite: Admission to graduate program.)				

---

## Mining Engineering

---

Min. 301	3 Credits		Spring	Min. 302	3 Credits		Spring	
	Mine Plant Design (3+0)				Underground Mine Environmental Engineering (2+3)			
Min. 370	3 Credits		Spring	Min. 400	1 Credit	As Dem. Wmnts.		
	Rock Mechanics (2+3)				Practical Engineering Report			
Min. 407	2 Credits	Alternate	Spring	Min. 408	3 Credits		Spring	
	Mineral Industry and the Environment (2+0)				Mineral Valuation and Economics (3+0)			
Min. 409	3 Credits		Spring	Min. 433	3 Credits	Alternate	Fall	
	Operations Research and Computer Applications in Mineral Industry (3+0)				Mining Access, Safety, and Environmental Law (3+0)			
Min. 443	3 Credits		Fall	Min. 445	3 Credits		Fall	
	Rock Fragmentation (3+0)				Design of Surface Mines for Conventional and Arctic Conditions (3+0)			
Min. 446	3 Credits		Fall	Min. 447	3 Credits		Fall	
	Underground Mining Methods and Their Design (3+0)				Mining Methods for Placer and Offshore Deposits (3+0)			
Min. 472	3 Credits		Fall	Min. 490	2 Credits		Spring	
	Design, Construction and Stability of Mining Openings (3+0)				Mining Design Project (1+3)			
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 methods including problem definition and statement, designing experiments, collecting data and interpreting them. Methods of theoretical and experimental analysis will be reviewed and examples given. (Prerequisites: Math. 302 or equivalent, Min. 370 or C.E. 435 or permission of instructor. Next offered: 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, Stat. 400 or equivalent.)							



---

## Museum Studies

---

<b>MSM 311</b>	<b>3 Credits</b>	<b>Alternate Fall</b>	<b>MSM 312</b>	<b>3 Credits</b>	<b>Alternate Spring</b>
<b>Museum Administration (3+0)</b>			<b>Museum Collection Management (3+0)</b>		
<b>MSM 487</b>	<b>3 Credits</b>	<b>As Dem. Wrmts.</b>	<b>MSM 488</b>	<b>3 Credits</b>	<b>As Dem. Wrmts.</b>
<b>Museum Practicum</b>			<b>Individual Research: Field Collecting Museum Specimens</b>		

---

## Music

---

### Music Ensembles And Class Lessons

<b>Mus. 307</b>	<b>1 Credit</b>	<b>Fall and Spring</b>	<b>Mus. 313</b>	<b>1, 2, 3 Credits</b>	<b>Fall/Spring</b>
<b>Chamber Music (0+3)</b>			<b>Opera Workshop (0+3, 6 or 9)</b>		
<b>Mus. 317</b>	<b>1 Credit</b>	<b>Fall and Spring</b>			
<b>Arctic Chamber Orchestra (0+3)</b>					
<b>Mus. 606</b>	<b>1-2 Credits</b>				<b>As Demand Warrants</b>
<b>Advanced Chamber Music (0+3)-(1+3)</b>					
<b>Advanced string, woodwind, brass, vocal chamber music, piano chamber music and accompanying.</b>					
<b>(prerequisite: Mus. 307 or permission of instructor.)</b>					

### Applied Music

<b>Mus. 661</b>	<b>2 or 4 Credits</b>				<b>Fall and Spring</b>
<b>Advanced Private Lessons</b>					
<b>Private instruction in piano, voice, or orchestral instruments consisting of one private lesson and one master class per week. Repeatable for credit. Private lesson fee: \$125. (Prerequisite: Music 462 or equivalent and by audition.)</b>					

### Music Theory, Music History, and Music Education

<b>Mus. 309</b>	<b>3 Credits</b>	<b>Fall</b>	<b>Mus. 315</b>	<b>2 Credits</b>	<b>Fall and Spring</b>
<b>Elementary School Music Methods (3+0)</b>			<b>Music Methods and Techniques (1+2)</b>		
<b>(Same as Ed. 309)</b>					
<b>Mus. 331</b>	<b>3 Credits</b>	<b>Alternate Spring</b>	<b>Mus. 351</b>	<b>3 Credits</b>	<b>Fall</b>
<b>Form and Analysis (3+0)</b>			<b>Conducting (3+0)</b>		
<b>Mus. 405</b>	<b>3 Credits</b>	<b>Spring</b>	<b>Mus. 421</b>	<b>3 Credits</b>	<b>Alternate Fall</b>
<b>Secondary School Music Methods (2+3)</b>			<b>Music before 1620 (3+0)</b>		
<b>Mus. 422</b>	<b>3 Credits</b>	<b>Alternate Spring</b>	<b>Mus. 423</b>	<b>3 Credits</b>	<b>Alternate Fall</b>
<b>Music in the Seventeenth and Eighteenth Centuries (3+0)</b>			<b>Music of the Nineteenth Century (3+0)</b>		
<b>Mus. 424</b>	<b>3 Credits</b>	<b>Fall</b>	<b>Mus. 431</b>	<b>3 Credits</b>	<b>Alternate Spring</b>
<b>Music in the Twentieth Century (3+0)</b>			<b>Counterpoint (3+0)</b>		

Mus. 432	3 Credits	Alternate Fall	Mus. 433	2-3 Credits	Alternate Fall
Orchestration and Arranging (3+0)			Seminar in Musical Composition (2+0, 3+0)		
Mus. 441	3 Credits	Alternate Fall			
Alaska Native Music and Social Change (3+0)					
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 Credit				As Demands Warrants
Seminar in Elementary and Secondary General Classroom Music (3+0)					
Discussion of the theoretical bases for developing objectives for general and classroom music in the elementary and secondary schools. Evaluation of current curricula, methods, and materials with respect to stated objectives. Evaluative methods in music. (Prerequisite: Permission of instructor.)					
Mus. 608	2 Credits				As Demand Warrants
Seminar in Secondary Music Ed. (2+0)					
An examination of current trends and problems in all aspects of secondary music education. Emphasis will be placed on curriculum development, philosophy and goals, instrumental and choral program administration, and aspects of music learning and evaluation. (Prerequisite: Permission of instructor.)					
Mus. 625	1-3 Credits				As Demand Warrants
Topics in Music History (1-3+0)					
Detailed study of selected topics 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: 1989-90.)					
Mus. 641	3 Credits				Alternate Fall
Methods of Ethnomusicological Research (3+0)					
Bibliography and research methods in non-Western music. New ethnomusicological research and approaches. (Prerequisites: Mus. 441 and/or permission of instructor. Next offered: 1989-90.)					
Mus. 651	2-3 Credits				As Demand Warrants
Advanced Conducting and Rehearsal Techniques (2-3+0)					
Study of conducting style and techniques and their application to representative compositions for different instrumental and vocal mediums. Repeatable for credit. (Prerequisites: Mus. 351 or equivalent and/or permission of instructor.)					
Mus. 671	3 Credits				As Demand Warrants
Psychology of Music (3+0)					
Study of the relationship of music to the human mind emphasizing such factors as musical perception, pattern recognition, psychoacoustics, and related topics. (Prerequisites: Mus. 232 or equivalent and/or permission of instructor.)					
Mus. 690	0 Credits				Fall and Spring
Graduate Recital					
Full length solo performance recital. (Prerequisite: Mus. 490 or equivalent, graduate standing in applied music study, permission of instructor.)					

## Petroleum Engineering

Pet.E. 301	3 Credits	Fall	Pet.E. 302	3 Credits	Spring
Reservoir Rock Properties (2+3)			Well Logging (3+0)		
Pet.E. 305	4 Credits	Spring	Pet.E. 321	3 Credits	Fall
Underground Fluids Behavior (3+3)			Advanced Thermodynamics for Petroleum Engineers (3+0)		
Pet.E. 400	1 Credit	Fall	Pet.E. 407	4 Credits	Fall
Practical Engineering Report (0+3)			Petroleum Production Engineering (3+3)		
Pet.E. 421	3 Credits	Fall	Pet.E. 426	4 Credits	Spring
Subsurface Engineering (3+0)			Drilling Engineering and Laboratory (3+3)		
Pet.E. 431	2 Credits	Fall	Pet.E. 456	3 Credits	Spring
Natural Gas Engineering (2+0)			Petroleum Evaluation and Economic Decisions (3+0)		
Pet.E. 466	3 Credits	Spring	Pet.E. 476	3 Credits	Fall and Spring
Petroleum Recovery Methods (3+0)			Petroleum Reservoir Engineering (3+0)		
Pet.E. 478	2 Credits	Spring	Pet.E. 489	2 Credits	Fall and Spring
Well Test Analysis (2+0)			Reservoir Simulation (2+0)		
Pet.E. 610	3 Credits				Fall
Advanced Reservoir Engineering (3+0)			Advanced treatment of topics in reservoir engineering including derivation and solution of the diffusivity equation, the real gas pseudo potential, and applications of materials balance equations to water influx calculations. (Prerequisite: Pet.E. 476 or permission of instructor.)		
Pet.E. 620	1 Credit				Fall
Graduate Research Seminar (1+0)			Introduction to research methodology including topics on structuring research proposals, methods of experimental design, and technical report writing; will include lectures by faculty in petroleum engineering outlining their research interests. (Prerequisite: Graduate standing in petroleum engineering.)		
Pet.E. 650	2 Credits				Spring
Advanced Topics in Petroleum Engineering (2+0)			A series of lectures by the faculty and outside speakers covering "state of the art" technology in selected topics of interest to petroleum engineers. Among others, topics will include the subject matter of graduate courses not offered during the semester at hand. (Prerequisite: Graduate standing in petroleum engineering or permission of instructor.)		
Pet.E. 661	3 Credits				Spring
Advanced Well Testing (3+0)			Equations for transient flow of single phase fluids through porous media, extension to sample multiphase flow, isolated and developed multi-well flow, conventional drawdown and buildup analysis, log-log type curve analysis, interference testing, fractured wells, pulse tests, and drill stem tests. (Prerequisite: Pet.E. 476 or Pet.E. 610.)		
Pet.E. 662	3 Credits				Every Third Semester
Enhanced Oil Recovery (3+0)			Secondary and tertiary oil recovery processes, including waterflooding and chemical and thermal recovery methods. (Prerequisite: Pet.E. 476 or Pet.E. 610. Next offered: Spring 1989.)		

<b>Pet.E. 663</b>	<b>3 Credits</b>	<b>Fall</b>
<b>Advanced Reservoir Simulation (3+0)</b>		
Mathematical description of the reservoir, history matching, and prediction for several published case studies of reservoir simulations, class project application to simulation of an Alaskan reservoir. (Prerequisites: Advanced engineering mathematics elective and Pet.E. 610.)		
<b>Pet.E. 664</b>	<b>3 Credits</b>	<b>Every Third Semester</b>
<b>Geothermal Reservoir Engineering (3+0)</b>		
Quantitative treatment of broad problems associated with the development of a geothermal fluid reservoir system. (Prerequisite: Graduate standing in an engineering discipline or approval of the instructor. Next offered: Fall 1990.)		
<b>Pet.E. 665</b>	<b>3 Credits</b>	<b>Every Third Semester</b>
<b>Advanced Phase Behavior (3+0)</b>		
The development and application of phase equilibrium simulators to predict fluid properties for reservoir fluids. (Prerequisites: Pet.E. 321 or permission of instructor. Next offered: Fall 1988.)		
<b>Pet.E. 666</b>	<b>3 Credits</b>	<b>Every Third Semester</b>
<b>Arctic Drilling and Well Completion (3+0)</b>		
Offshore and onshore methods of 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

---

<b>Phil. 321</b>	<b>3 Credits</b>	<b>Alternate Fall</b>	<b>Phil. 322</b>	<b>3 Credits</b>	<b>Alternate Spring</b>
<b>Aesthetics (3+0)</b>			<b>Ethics (3+0)</b>		
<b>Phil. 341</b>	<b>3 Credits</b>	<b>Alternate Fall</b>	<b>Phil. 342</b>	<b>3 Credits</b>	<b>Alternate Spring</b>
<b>Epistemology (3+0)</b>			<b>Metaphysics (3+0)</b>		
<b>Phil. 351</b>	<b>3 Credits</b>	<b>Fall</b>	<b>Phil. 471</b>	<b>3 Credits</b>	<b>Alternate Fall</b>
<b>Phil. 352</b>	<b>3 Credits</b>	<b>Spring</b>	<b>Contemporary Philosophical Problems (3+0)</b>		
<b>History of Philosophy and Science (3+0)</b>					
<b>Phil. 481</b>	<b>3 Credits</b>	<b>Alternate Spring</b>	<b>Phil. 482</b>	<b>3 Credits</b>	<b>Alternate Fall</b>
<b>Philosophy of Science (3+0)</b>			<b>Comparative Religion (3+0)</b>		
<b>Phil. 483</b>	<b>3 Credits</b>	<b>Alternate Spring</b>	<b>Phil. 484</b>	<b>3 Credits</b>	<b>Alternate Spring</b>
<b>Philosophy of Social Science (3+0)</b>			<b>Philosophy of History (3+0)</b>		

---

## Physical Education

---

<b>P.E. 300</b>	<b>1 Credit</b>	<b>Alternate Fall</b>	<b>P.E. 302</b>	<b>1 Credit</b>	<b>Alternate Fall</b>
<b>Advanced Theory and Techniques for Teaching Gymnastics (1+3)</b>			<b>Advanced Theory and Techniques for Teaching Basketball (1+3)</b>		
<b>P.E. 303</b>	<b>1 Credit</b>	<b>Alternate Fall</b>	<b>P.E. 304</b>	<b>1 Credit</b>	<b>Alternate Spring</b>
<b>Advanced Theory and Techniques for Teaching Ice Sports (1+3)</b>			<b>Advanced Theory and Techniques for Teaching Snow Sports (1+3)</b>		



P.E. 305	1 Credit	Alternate Fall	P.E. 306	1 Credit	Alternate Fall
Advanced Theory and Techniques for Teaching Volleyball (1+3)			Techniques in Teaching Creative Dance (1+3)		
P.E. 307	1 Credit	Alternate Spring	P.E. 308	1 Credit	Alternate Fall
Techniques in Camping and Outdoor Recreation (1+3)			Techniques in Track and Field (1+3)		
P.E. 309	2 Credits	Spring	P.E. 310	1 Credit	Alternate Spring
Aquatic Instructor (1+3)			Techniques in Teaching Folk and Square Dancing (1+3)		
P.E. 316	3 Credits	Fall	P.E. 317	3 Credits	Spring
Motor Development (3+0)			Motor Learning (3+0)		
P.E. 321	1 Credit	Fall and Spring	P.E. 327	2 Credits	Spring
Practicum in Physical Education (0+3)			Movement Activities for Children (2+0)		
P.E. 400	2 Credits	Alternate Fall	P.E. 401	2 Credits	Alternate Fall
Judging and Coaching of Gymnastics (1+3)			Theory of Basketball (2+0)		
P.E. 405	2 Credits	Fall	P.E. 406	3 Credits	Alternate Fall
Concepts and Design of Physical Fitness Programs (1 1/2+1 1/2)			Methods of Teaching Physical Education (2+3)		
P.E. 408	2 Credits	Alternate Spring	P.E. 411	3 Credits	Every Third Semest.
Aquatics Program Management (2+0)			History and Philosophy of Sports and Physical Activity (3+0)		
P.E. 412	3 Credits	Alternate Fall	P.E. 421	4 Credits	Fall
Principles and Problems of Athletic Coaching (3+0)			Physiology of Exercise (3+3)		
P.E. 425	3 Credits	Alternate Fall	P.E. 432	4 Credits	Alternate Fall
Administration in Physical Education and Athletics (3+0)			Biomechanics of Physical Performance (3+3)		
P.E. 437	3 Credits	Alternate Spring	P.E. 440	3 Credits	Spring
Adapted Programs of Physical Activity (3+0)			Care and Prevention of Athletic Injuries (3+0)		
P.E. 442	3 Credits	Alternate Spring			
Measurement and Evaluation in Physical Education (3+0)					

## Physics

Phys. 311	4 Credits	Fall	Phys. 312	4 Credits	Spring
Mechanics I (4+0)			Mechanics II (4+0)		
Phys. 313	4 Credits	Fall	Phys. 331	3 Credits	Fall
Thermodynamics and Statistical Physics (4+0)			Phys. 332 3 Credits Electricity and Magnetism (3+0)		

Phys. 381	2 Credits	Fall	Phys. 411	4 Credits	Fall
Phys. 382	2 Credits	Spring	Phys. 412	4 Credits	Spring
Physics Laboratory (0+6)			Modern Physics (4+0)		

Phys. 445	3 Credits	Spring	Phys. 462	4 Credits	Fall
Solid State Physics and Physical Electronics (3+0)			Geometrical and Physical Optics (3+3)		

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: Permission of instructor and Math 422; Phys. 611, or the equivalent, for Phys. 612. Next offered: 1988-89)

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. 626	3 Credits	Alternate Fall
Fundamentals of Plasma Physics (3+0)		

Single charge particle motion in the electromagnetic fields, plasma kinetic theory, Vlasov equations for collisionless plasmas, magnetohydrodynamic equations, linear plasma waves and instabilities, nonlinear plasma waves and instabilities. (Prerequisite: Graduate standing in SPAS. Next offered: 1989-90.)

Phys. 627	3 Credits	Alternate Spring
Advanced Plasma Physics (3+0)		

Vlasov description of small amplitude waves in magnetized plasmas, advanced particle orbit theory, fluctuation and incoherent scattering theory, plasma discontinuities and collisionless shocks, weak turbulent theory, statistical theory of turbulence. (Prerequisite: Graduate standing in SPAS. Next offered: 1988-89.)

Phys. 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 data 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: 1988-89.)

Phys. 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: 1989-90.)

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 the equivalent, for Phys. 632. Next offered: 1988-89.)

Phys. 640 3 Credits Alternate Spring

**Auroral Physics (3+0)**

The physical and chemical processes that underline 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 electric fields. The auroral energy budget. (Prerequisite: Graduate standing in geosciences or permission of instructor. Next offered: 1988-89.)

Phys. 645 3 Credits Alternate Fall

**Fundamentals of Geophysical Fluid Dynamics (3+0)**

An introduction to the mechanics of fluid systems, the fundamental processes and Navier-Stokes' equations in rotating and stratified fluids, boundary layer phenomena, turbulent flows and mixing, wave motions and applications. (Prerequisite: Graduate standing in SPAS. Next offered: 1988-89.)

Phys. 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, mesosphere, and stratosphere. Dynamical processes and upper air winds. The airglow. Electrodynamic processes and ionospheric currents. (Prerequisite: Graduate standing in SPAS or permission of instructor. Next offered: 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. (Permission of instructor and Phys. 651, or the equivalent, for Phys. 652. Next offered: 1988-89.)

Phys. 672 3 Credits Alternate Fall

**Magnetospheric Physics (3+0)**

Mass, momentum and energy transfer in the solar wind-magnetosphere - ionosphere interaction, electrodynamics of the magnetosphere - ionosphere coupling, auroral acceleration process, auroral kilometric radiation, geomagnetic pulsations, magnetospheric substorm phenomena and theories, generation mechanism of field-aligned currents, structures and instabilities at the magnetopause. (Prerequisite: Graduate standing in SPAS. Next offered: 1989-90.)

Phys. 673 3 Credits Alternate Spring

**Space Physics (3+0)**

Sun spot formation, solar flare theories, solar wind, planetary bowshocks and interplanetary shocks, cosmic rays, pulsar, magnetic field reconnection concepts and theories, dynamo theories. (Prerequisite: Graduate standing in SPAS. Next offered: 1989-90.)

---

## Political Science

---

P.S. 301 3 Credits Alternate Fall  
 American Presidency (3+0)

P.S. 302 3 Credits Alternate Spring  
 Congress and Public Policy (3+0)

P.S. 303	3 Credits	Fall	P.S. 310	3 Credits	Alternate Fall
Introduction to Legal Processes (3+0) (Same as Just. 303)			The Politics of Post-Industrial States (3+0)		
P.S. 311	3 Credits	Alternate Spring	P.S. 312	3 Credits	Alternate Fall
Government and Politics of the Soviet Union (3+0)			Government and Politics of China (3+0)		
P.S. 315	3 Credits	Alternate Spring	P.S. 321	3 Credits	Fall
American Political Thought (3+0)			International Politics (3+0)		
P.S. 322	3 Credits	Alternate Spring	P.S. 325	3 Credits	Spring
International Law and Organizations (3+0)			Native Self Government (3+0) (Same as ANS 325)		
P.S. 330	3 Credits	Spring	P.S. 400	3 Credits	Fall
Law and Society (3+0) (Same as Just. 330)			Political Science Research Methods (3+0)		
P.S. 401	3 Credits	Alternate Spring	P.S. 402	3 Credits	Alternate Spring
Political Behavior: Organizations (3+0)			Political Behavior: Individuals (3+0)		
P.S. 403	3 Credits	Alternate Spring	P.S. 404	3 Credits	Spring
Public Policy (3+0)			Introduction to Legal Research and Writing (3+0) (Same as Just. 404)		
P.S. 411	3 Credits	Alternate Fall	P.S. 412	3 Credits	Alternate Spring
Classical Political Theory (3+0)			Modern Political Theory (3+0)		
P.S. 415	3 Credits	Alternate Fall	P.S. 435	3 Credits	Alternate Fall
Contemporary Political Theory (3+0)			The Supreme Court and the American Legal System (3+0)		
P.S. 436	3 Credits	Alternate Spring	P.S. 437	3 Credits	Alternate Spring
The Courts and Civil Liberties (3+0)			Foreign Policy (3+0)		
P.S. 475	3 Credits	Fall and Spring	P.S. 480	1-3 Credits	Fall and Spring
Internship in Public Affairs (3+0)			Model United Nations (1-3+0)		
P.S. 480A		Fall	P.S. 481	3 Credits	As Dem. Wrmts.
Model U.N.: Member Nations			Geopolitics and the International Environment (3+0)		
P.S. 480B		Spring			
Model U.N.: Simulation					
P.S. 480C		Spring			
Model U.N.: Conference Participation					

## Psychology

Psy. 304	3 Credits	Fall	Psy. 330	3 Credits	Spring
Personality (3+0) (Same as Soc. 304)			Social Psychology (3+0) (Same as Soc. 330)		
Psy. 345	3 Credits	Fall	Psy. 350	3 Credits	Alternate Spring
Abnormal Psychology(3+0)			Comparative Psychology (3+0)		

Psy. 356	3 Credits	Spring	Psy. 370	3 Credits	Alternate Fall
Foundations of Counselling II (3+0) (Same as HMSV 351)			Drugs and Drug Dependence (3+0) (Same as Soc. 370)		
Psy. 380	3 Credits	Alternate Fall	Psy. 440	3 Credits	Alternate Spring
Human Behavior in the Arctic (3+0)			Learning (3+0)		
Psy. 445	3 Credits	Fall	Psy. 450	4 Credits	Spring
Community Psychology (3+0) (Same as HMSV 445)			Experimental Psychology(2+6)		
Psy. 460	4 Credits	Alternate Fall	Psy. 470	3 Credits	Alternate Fall
Physiological Psychology (3+3)			Sensation and Perception (3+0)		
Psy. 473	3 Credits	Fall			
Social Science Research Methods (3+0) (Same as Soc. 473)					
Psy. 610	3 Credits				Fall
Alcohol: Pharmacology and Behavior (3+0) A multidisciplinary approach to the study of alcohol abuse and alcoholism which incorporates the biomedical, epidemiological, genetic, pharmacological, psychological, social, and 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 delineation of the most common approaches to 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. 631	3 Credits				Spring
Community Psychology: Cross-Cultural Applications & the Ethics of Change (3+3 hrs. Community Practicum) Application of principles of community psychology to cross-cultural settings, especially in Alaska. Indigenous and alternative approaches to change. Value-context of community psychology is examined - the ethics of intervention, the dynamics of individual and community empowerment and liberation, the					

spiritual dimension of socio-economic development. A community-based practicum is central to the course, as is participation in Native elders and community providers. (Prerequisites: Graduate standing in community psychology master's program and Psy. 630 or permission of instructor.)

**Psy. 635** **3 Credits** **Spring**  
**Field-Based Research Methods (3+0)**

A presentation of methods used in doing cross-cultural research in community settings. The emphasis is on the formal descriptions 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 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 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. (Prerequisite: 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. 662** **3 Credits** **Fall**

**Transformational Development and Psychotherapy (3+0)**

Depth psychological perspectives, including both modern psychodynamic approaches and mythological traditions from various cultures, of the development of consciousness and the self. The relationship of suffering and psychopathology to stages of development. Self-study and clinical methods which draw upon expressions of the unconscious, focusing therapeutic work with dreams. (Prerequisite: Graduate standing in community psychology or permission of the instructor. Next offered: 1989-90.)

**Psy. 663** **3 Credits** **Fall**

**Clinical Methods and Assessment (3+0)**

Fundamentals of therapeutic interviewing. Assessment of personality style and classification of psychopathology. Introduction survey of, and experience with, psychological tests. (Prerequisite: 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 to gain facility with the skills involved. (Prerequisite: Permission of instructor.)

**Psy. 665** **3 Credits** **Alternate Fall**

**Psychoanalytic Theory and Clinical Method (3+0)**

Psychoanalytic theory and the study of lives are presented to acquaint the student with the analysis of life histories or psychoanalytic perspective. Students study the therapeutic procedures of Freud, Jung, Searles, Sullivan, Lacan, and object relations theorists. (Prerequisite: Permission of instructor.)

**Psy. 666** **3 Credits** **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/meaningless 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. The course draws heavily on data from sociology and anthropology. As much evidence as is





R.D. 425 3 Credits As Dem. Wrmts.  
Cultural Impact Analysis (3+0)

R.D. 450 3 Credits As Dem. Wrmts.  
Managing Community Development  
Project and Programs (3+0)

R.D. 475 3 Credits As Dem. Wrmts.  
Rural Development Senior Project

## Russian

Russ. 301 3 Credits Alternate Fall  
Russ. 303 3 Credits Alternate Fall  
Advanced Russian (3+0)

Russ. 387 2 Credits Alternate Fall  
Individual Study: Semantics

Russ. 432 3 Credits Spring  
Studies in Russian Literature and  
Civilization (3+0)

Russ. 487 2 Credits Alternate Fall  
Individual Study: Translations (2+0)

## Social Work

SWK. 306 3 Credits Spring  
Social Welfare: Policies and Issues (3+0)

SWK. 320 3 Credits Fall  
Rural Social Work (3+0)

SWK. 360 3 Credits Alternate Spring  
The Helping Role in Child Abuse and  
Neglect (3+0)

SWK. 442 3 Credits Fall  
Human Behavior in the Social  
Environment (3+0)

SWK. 460 3 Credits Fall  
Social Work Practice (3+0)

SWK. 461 6 Credits Fall  
Practicum in Social Work I

SWK. 463 3 Credits Spring  
Social Work Practice II

SWK. 464 6 Credits Spring  
Practicum in Social Work II

SWK. 484 3 Credits As Dem. Wrmts.  
Seminar in Social Work Practice Areas  
(3+0)

## Sociology

Soc. 301 3 Credits Spring  
Rural Sociology (3+0)

Soc. 307 3 Credits Spring  
Demography (3+0)

Soc. 309 3 Credits Alternate Fall  
Urban Sociology (3+0)

Soc. 310 3 Credits Alternate Spring  
Sociology of Later Life (3+0)

Soc. 330 3 Credits Spring  
Social Psychology (3+0)  
(Same as Psy. 330)

Soc. 335 3 Credits Fall  
Sociology of Deviant Behavior (3+0)

Soc. 345 3 Credits Fall  
Sociology of Education (3+0)  
(Same as Ed. 345)

Soc. 363 3 Credits Fall  
Social Stratification (3+0)

Soc. 370	3 Credits	Alternate Fall	Soc. 402	3 Credits	Spring
Drugs and Drug Dependence (3+0) (Same as Psy. 370)			Theories of Sociology (3+0)		
Soc. 405	3 Credits	Alternate Spring	Soc. 406	3 Credits	Alternate Spring
Social Change (3+0)			Environmental Sociology (3+0)		
Soc. 407	3 Credits	Alternate Spring	Soc. 408	3 Credits	Alternate Spring
Formal Organization (3+0)			American Minority Groups (3+0)		
Soc. 473	3 Credits	Fall			
Social Science Research Methods (3+0) (Same as Psy. 473)					
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 for coping effectively with situations in order to reduce the 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

---

Span. 301	3 Credits	Alternate Fall	Span. 387	2 Credits	Alternate Fall
Span. 303	3 Credits	Alternate Fall	Individual Study: Semantics		
Advanced Spanish (3+0)					
Span. 432	3 Credits	Spring	Span. 487	2 Credits	Alternate Fall
Studies in Hispanic Literature and Culture (3+0)			Individual Study: Translation of Texts		
Span. 488	3 Credits	As Dem. Wrmts.			
Individual Study: Senior Project					

## Speech Communication

Sp.C. 320	3 Credits	Alternate Years	Sp.C. 321	3 Credits	Alternate Years
Communication and Language (3+0)			Nonverbal Communication (3+0)		
Sp.C. 322	3 Credits	Alternate Years	Sp.C. 330	3 Credits	Alternate Years
Interpersonal Communication (3+0)			Intercultural Communication (3+0)		
Sp.C. 331	3 Credits	Alternate Years	Sp.C. 335	3 Credits	Alternate Years
Group Communication (3+0)			Organizational Communication (3+0)		
Sp.C. 342	3 Credits	Alternate Years	Sp.C. 425	3 Credits	Alternate Years
Advanced Public Speaking (3+0)			Communication Theory (3+0)		
Sp.C. 441	3 Credits	Alternate Years	Sp.C. 443	3 Credits	Alternate Years
Persuasion (3+0)			Rhetorical Theory (3+0)		
Sp.C. 475	3 Credits	Alternate Years	Sp.C. 482	3 Credits	Alternate Years
Speech Communication in Education and Training (3+0)			Seminar in Speech Communication (3+0)		

## Statistics

Stat. 301	3 Credits	Fall and Spring	Stat. 351	2 Credits	Spring
Elementary Probability and Statistics (3+0)			Statistical Computing Packages (1+3)		
Stat. 400	3 Credits	Fall	Stat. 401	4 Credits	Fall
Statistics (3+0)			Experimental Design and Regression (3+3)		
Stat. 402	3 Credits	Fall and Spring	Stat. 431	3 Credits	Alternate Fall
Scientific Sampling (2+3)			Applied Nonparametric Statistics (3+0)		
Stat. 461	3 Credits	Alternate Spring			
Applied Multivariate Statistics (3+0)					
Stat. 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, lattice and cubic lattice designs, treatment of missing data, comparison of designs. (Prerequisites: Stat. 401 or consent of instructor.)					
Stat. 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 based on ranks; multivariate statistics, including principle 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 the student's research interests. (Prerequisites: Stat. 301, 302 and either graduate standing in a biologically oriented field or permission of instructor. Next offered: 1989-90.)					

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 Geology  
 Econ. 226--Introduction to Statistics for Economics and Business  
 Econ. 227--Statistical Methods  
 Econ. 626--Econometrics  
 E.S.M. 620--Statistics for E.S.M.  
 E.S.M. 621--Operations Research  
 Math. 371--Probability  
 Math. 408--Mathematical Statistics  
 Psy. 250--Introduction to Statistics for Behavioral Sciences  
 Psy. 360--Psychological Tests and Measurements  
 WLF 621--Vertebrate Population Dynamics  
 WLF 630--Quantitative Fisheries Science

## Theater

Thr. 301	1-3 Credits	Fall and Spring	Thr. 321	3 Credits	Alternate Spring
Thr. 401	1-3 Credits	Fall and Spring	Acting II (1+4)		
Theater Practicum (0+Var.)					
Thr. 325	3 Credits	Alternate Fall	Thr. 331	3 Credits	Alternate Fall
Theater Speech (2+2)			Directing (1+4)		
Thr. 341	3 Credits	Alternate Years	Thr. 343	3 Credits	Alternate Fall
Intermediate Stagecraft (2+2)			Scene Design (3+0)		
Thr. 347	3 Credits	Alternate Spring	Thr. 351	3 Credits	Spring
Lighting Design (3+0)			Makeup for Theater (1+4)		
Thr. 354	3 Credits	Fall	Thr. 355	3 Credits	Alternate Spring
Custom Construction and Design (3+0)			History of Stage Costume (3+0)		
Thr. 361	3 Credits	Fall	Thr. 411	3 Credits	Alternate Years
Advanced Tuma Theater (3+0) (Same as ANS 361)			Theater History I (3+0)		
Thr. 412	3 Credits	Alternate Years	Thr. 413	3 Credits	Alternate Fall
Theater History II (3+0)			Playscript Analysis (3+0)		
Thr. 421	3 Credits	As Dem. Wrmts.	Thr. 435	3 Credits	As Dem. Wrmts.
Period Styles of Acting (2+2)			Directing (3+0)		
Thr. 456	3 Credits	Alternate Spring	Thr. 471	3 Credits	Alternate Years
Intermediate Costuming (3+0)			Methods in Secondary Theater Education (3+0)		

## Wildlife

<b>WLF 302</b>	<b>2 Credits</b>	<b>Alternate Fall</b>	<b>WLF 303</b>	<b>3 Credits</b>	<b>Fall</b>
Fish and Wildlife Ecology and Management (1+3)			Wildlife Management Techniques (2+3)		
<b>WLF 304</b>	<b>1-3 Credits</b>	<b>Fall and Spring</b>	<b>WLF 305</b>	<b>3 Credits</b>	<b>Alternate Fall</b>
Wildlife Internships			Concepts of Animal/Wildlife Diseases (2+3)		
<b>WLF 360</b>	<b>3 Credits</b>	<b>Fall</b>	<b>WLF 410</b>	<b>3 Credits</b>	<b>Spring</b>
Nutrition and Physiological Ecology of Wildlife (3+0)			Wildlife Populations and Their Management (2+3)		
<b>WLF 417</b>	<b>2 Credits</b>	<b>Alternate Spring</b>	<b>WLF 419</b>	<b>3 Credits</b>	<b>Alternate Fall</b>
Wildlife Management: Forest and Tundra (2+0)			Waterfowl and Wetlands Ecology and Management (3+0)		
<b>WLF 420</b>	<b>3 Credits</b>	<b>Spring</b>			
Wildlife Policy and Administration (3+0)					
<b>WLF 611</b>		<b>Credits Arr.</b>	<b>As Demand Warrants</b>		
<b>WLF 612</b>		<b>Credits Arr.</b>	<b>As Demand Warrants</b>		
<b>Wildlife Field Trip</b>					
Trips to wildlife areas to acquaint students with principal animals of the state and problems involved in their management. (Admission by arrangement.)					
<b>WLF 614</b>	<b>2 Credits</b>		<b>Alternate Spring</b>		
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.)					
<b>WLF 615</b>	<b>2 Credits</b>		<b>Alternate Fall</b>		
Advanced Topics in Wildlife Management (2+0)					
Political, economic, administrative and ecologic aspects of wildlife management in northern regions. (Prerequisite: graduate standing in biology or wildlife or permission of instructor. Next offered: 1989-90.)					
<b>WLF 621</b>	<b>3 Credits</b>		<b>Alternate Spring</b>		
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. (Prerequisites: Admission by arrangement: minimal preparation, equivalent to Biol. 271, Math. 200 and Stat. 301. Next offered: 1988-89.)					
<b>WLF 692</b>	<b>1 Credit</b>		<b>Fall and Spring</b>		
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. (Prerequisite: graduate standing or permission of instructor.)					

## FACULTY AND STAFF

Faculty are listed from those departments which grant graduate degrees. Faculty in other departments also participate on some graduate student advisory committees. 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
CLA	College of Liberal Arts
CNS	College of Natural Sciences
CES	Cooperative Extension Service
FTIC	Fishery Industrial Technology Center
GI	Geophysical Institute
IAB	Institute of Arctic Biology
IMS	Institute of Marine Science
INE	Institute of Northern Engineering
JCFOS	Juneau Center for Fisheries and Ocean Sciences
LIB	Elmer Rasmuson Library
MAP	Marine Advisory Program
RC	College of Rural Alaska
SALRM	School of Agriculture and Land Resources Management
SCEE	School of Career and Continuing Education
SOE	School of Engineering
SFOS	School of Fisheries and Ocean Sciences
SOM	School of Management
SME	School of Mineral Engineering
STUAFF	Student Affairs
UAM	University of Alaska Museum
VCA	Vice Chancellor for Administration
VCAA	Vice Chancellor for Academic Affairs
VCR	Vice Chancellor for Research

- Adu-Asamoah, Richard** -- 1987 -- Visiting Assistant Professor of Economics (1987), SOM. University of Science and Technology, Ghana '79, B.S.; Cornell University '83, M.S.; Oregon State University '87, Ph.D.
- Aigner, Jean S.** -- 1978 -- Professor of Anthropology (1978), CLA. University of Wisconsin '64, B.A.; '66, M.A.; '69, Ph.D.
- Akasofu, Syun-Ichi** -- 1958 -- Director of the Geophysical Institute (1986) and Professor of Geophysics (1964), GI, CNS. Tohoku University '53, B.S.; '57, M.S.; University of Alaska '61, Ph.D.
- Alexander, Vera** -- 1962 -- Director, Institute of Marine Science (1979), Acting Dean, School of Fisheries and Ocean Sciences (1987) and Professor of Marine Science (1974), IMS, SFOS. University of Wisconsin '55, B.A.; '62, M.S.; University of Alaska '65, Ph.D.
- Andresen, Marvin J.** -- 1985 -- Associate Professor of Business Administration (1985), SOM. University of Illinois Urbana '55, B.S.; '56, M.S.; 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, Santa Barbara '76, Ph.D.
- Armbruster, W. Scott** -- 1980 -- Associate Professor of Botany (1987), IAB, CNS. University of California, Santa Barbara '72, B.A.; University of California, Davis '77, M.S.; '81, Ph.D.
- Aspnes, John D.** -- 1978 -- Professor of Electrical Engineering (1981), and Head, Department of Electrical Engineering (1983), SOE. University of Wisconsin '65, M.S.; Montana State University '76, Ph.D.; P.E.
- Baker, Grant C.** -- 1988 -- Visiting Assistant Professor of Mechanical Engineering (1988), SOE. University of Washington '78, B.S.; University of Alaska Fairbanks '83, M.S.; '87, Ph.D.
- Baker, Jill H.** -- 1987 -- Assistant Professor of Social Work (1988), RC. University of Texas '68, B.A.; University of Hawaii '81, M.S.W.
- Bandopadhyay, Sukumar** -- 1982 -- Associate Professor of Mining Engineering (1987), SME. Banaras Hindu University, India, '70, B.Sc.; '75, M.Tech.; Pennsylvania State University '79, M.S.; '81, Ph.D.
- Barber, Willard E.** -- 1976 -- Associate Professor of Fisheries (1988), CNS. Arizona State University '65, B.A.; '68, M.S.; Michigan State University '70, Ph.D.
- Barnes, Brian M.** -- 1986 -- Assistant Professor of Zoophysiology (1986), IAB, CNS. University of California, Riverside '77, B.S.; University of Washington '83, Ph.D.
- Barnhardt, Raymond J.** -- 1970 -- Professor of Education (1980), RC. North Dakota State University '65, B.S.; Johns Hopkins University '67, M.Ed.; University of Oregon, '70, Ph.D.
- Bartlett, DorlaAnn** -- 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 -- Assistant Professor of Anthropology, Coordinator of

Cross Communications (1987), CLA. Arizona State University '67, B.A.; San Jose State University '77, M.A.; University of Michigan '86, Ph.D.

**Beget, James E.** -- 1984 -- Assistant Professor of Geology (1984), CNS. Columbia University '74, B.S.; University of Washington '77, M.S.; '81, Ph.D.

**Bennett, F. Lawrence** -- 1968 -- Professor of Engineering Management (1974) and Head, Department of Engineering and Science Management (1983), SOE. Rensselaer Polytechnic Institute '61, B.C.E.; Cornell University '63, M.S.; '66, Ph.D.; P.E.; L.S.

**Benson, Carl S.** -- 1960 -- Professor Emeritus of Geophysics (1987), GI, CNS. University of Minnesota '50, B.A.; '56, M.S.; California Institute of Technology '60, Ph.D.

**Ben-Ur, Joseph** -- 1987 -- Assistant Professor of Business Administration (1987), SOM. Hebrew University of Jerusalem, Israel '74, B.A.; '77, M.B.A.; University of Illinois at Champaign-Urbana '87, Ph.D.

**Berman, Gerald S.** -- 1980 -- Associate Professor of Sociology and Social Work (1980) and Head, Department of Behavioral Sciences and Human Services (1988), RC. University of Michigan '56, B.A.; Case Western Reserve University '63, M.S.W.; '70, Ph.D.

**Bieslot, 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 Marsh Rice University '82, Ph.D.

**Birkeland, Mary M.** -- 1987 -- Assistant Professor of Education and Field Coordinator (1987), RC. Western Washington State College '76, B.Ed.; University of Oregon '84, M.Ed.; '87, Ph.D.

**Biswas, Nirendra N.** -- 1971 -- Professor of Geophysics (1983), GI, CNS. 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.

**Blake, John E.** -- 1988 -- Assistant Professor of Veterinary Science (1988), IAB, CNS. Western College of Veterinary Medicine '80, DVM; '87, MVSc

**Borgeson, Cory** -- 1983 -- Adjunct Assistant Professor of Business Administration (1985), SOM. Oakland University '78, B.A.; Drake University of Law '81, J.D.

**Botha, Jan L.** -- 1985 -- Associate Professor of Civil Engineering (1985), SOE. 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), GI, CNS. Radcliffe '63, A.B.; University of Alaska '67, M.S.; '70, Ph.D.

**Bowyer, R. Terry** -- 1986 -- Associate Professor of Wildlife Ecology (1988), IAB, CNS. Humboldt State University '70, B.S.; '76, M.S.; University of Michigan '85, Ph.D.

**Boyce, John R.** -- 1988 -- Assistant Professor of Economics (1988), SOM. Montana State University '82, B.A.; University of California, Davis '88, Ph.D.

**Boze, Ken M.** -- 1984 -- Associate Professor of Accounting (1988), SOM. University of



Florida-Gainesville '74, B.S.B.A.; '75, M.B.A.; University of Arkansas-Fayetteville '83, Ph.D.

**Brennen, E. Clifford** -- 1984 -- Professor of Social Work (1984), RC. San Francisco State University '56, B.A.; University of California, Berkeley '58, M.S.W.; '68, D.S.W.

**Brown, Edward J.** -- 1975 -- Professor of Microbiology (1988) and 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) and Assistant Professor of Geophysics (1969), GI, CNS. Washington State University '61, B.S.; University of Alaska '66, M.S.

**Bruce, Leroy Ben** -- 1984 -- Assistant Professor of Plant Ecology (1986), SALRM. New Mexico 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.

**Butler-Hopkins, Kathleen M.** -- 1979 -- Associate Professor of Music (1983), CLA. Trinity College of Music, London, England, '71, F.T.C.I.; The Juilliard School '76, B.M.; '76, M.M.; Yale University School of Music '78, M.M.A.; '82, D.M.A.

**Button, Don K.** -- 1964 -- Professor of Marine Science and Biochemistry (1973), IMS, SFOS, CNS. Wisconsin State College '55, B.S.; University of Wisconsin '61, M.S.; '64, Ph.D.

**Carling, Donald E.** -- 1981 -- Associate Professor of Horticulture (1986), AFES. St. Cloud State '67, B.A.; University of Missouri-Columbia '69, M.S.; '75, Ph.D.

**Carlson, Robert F.** -- 1965 -- Professor of Civil Engineering (1974), SOE. University of Wisconsin '61, B.S.; '63, M.S.; '67, Ph.D.

**Chapin III, F. Stuart** -- 1973 -- Professor of Plant Physiological Ecology (1984), IAB, CNS. Swarthmore College '66, B.A.; Stanford University '73, Ph.D.

**Christensen, Douglas** -- 1988 -- Assistant Professor of Geophysics (1988), GI, CNS. University of Utah '77, B.S.; University of Michigan '79, M.S.; '87, Ph.D.

**Cochran, Verlan** -- 1985 -- Affiliate Associate Professor of Agronomy (1985), SALRM. California State Polytechnic College '66, B.S.; Washington State University '71, M.S.

**Cole, James W.** -- 1973 -- Director, Center for Health and Counseling (1976), Assistant Professor of Education and Assistant Professor of Psychology (1973), STUAFF, RC. Chico State College '64, B.A.; Oregon State University '67, M.Ed.; University of North Colorado '71, Ed.D., Licensed Psychologist, '79.

**Cole, Terrence M.** -- 1983 -- Assistant Professor of History (1988), CLA. University of Alaska Fairbanks '76, B.A.; '78, M.A.; University of Washington '83, Ph.D.

**Collie, Jeremy S.** -- 1988 -- Assistant Professor of Fisheries (1988), JCFOS. University of York '80, B.Sc.; Massachusetts Institute of Technology '85, Ph.D.

**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 and Assistant Professor of Psychology (1983), STUAFF, RC. State University College at Cortland, New York '72, B.S.; University of Delaware '74, M.Ed.; University of Missouri-Columbia '83, Ph.D.

**Cook, Donald J.** -- 1957 -- Dean, School of Mineral Engineering (1985), Director of Mineral Industry Research Laboratory (1984), Professor Emeritus of Mineral Beneficiation (1979), MIRL, 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, SFOS. University of Washington '64, B.S.; '67, M.S.; '71, Ph.D.

**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 -- Associate Professor of Accounting (1987), 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.

**Crapo, Charles A.** -- 1983 -- Assistant Professor of Seafood Technology (1983), FTTC, MAP. Oregon State University '74, B.S.; '83, M.S.

**Crowder, R. Keith** -- 1983 -- Assistant Professor of Geology (1983), GI, 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 Agriculture Engineering (1982), AFES. University of Tennessee '77, B.S.; '82, Ph.D.

**Das, Deben K.** -- 1984 -- Associate Professor of Mechanical Engineering (1988), SOE. Sambalpur University '72, B.S.; Brown University '74, Sc.M.; University of Rhode Island '83, Ph.D., P.E.

**Davies, John** -- 1986 -- State Seismologist (1987) and Affiliate Associate Professor of Geology (1987), GI, CNS. Reed College '67, B.A.; University of Alaska '75, Ph.D.

**Dean, Frederick** -- 1954 -- Professor of Wildlife Management (1966), CNS. University of Maine '50, B.S.; '52, M.S.; State University of New York '57, Ph.D.

**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 Julliard School '67, M.S.; University of Connecticut '77, 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.

**Demmert, Dennis** -- 1974 -- Director, Native Studies (1978) and Associate Professor of Education (1987), RC. Harvard University '72, Ed.M.

**Deviche, Pierre** -- 1988 -- Associate Professor of Zoophysiology (1988), IAB, CNS. University of Liege '75, B.S.; '80, Ph.D.

**DiCecco, Bruno** -- 1981 -- Associate Professor of Music (1983), CLA. Yale University School of Music '57, B.M.; '58, M.M.

**Diehl, Carol S.** -- 1982 -- Staff Counselor, Center for Health & Counseling and Assistant Professor of Counseling (1982), STUAFF, RC. Juniata College '71, B.A.; West Virginia University '75, M.A.; '81, Ed.D.

**Distad, Jack** -- 1955 -- Professor of Mathematics (1974), CLA. Montana State University '53, B.S.; '55, M.S.

**Drew, James V.** -- 1976 -- Dean, School of Agriculture and Land Resources

Management, Director, Agricultural and Forestry Experiment Station, and Professor of Agronomy (1976), AFES, SALRM. Rutgers University '52, B.S.; '57, Ph.D.

**Dubbs, Patrick J.** -- 1968 -- Associate Professor of Education and Head, Department of Rural Development (1982), RC. University of Notre Dame '60, B.A.; Michigan State University '75, Ph.D.

**Duff, John A.** -- 1980 -- Associate Professor of Music (1986) and Head, Department of Music (1987), CLA. University of Washington '73, B.A.; B.Mus; Michigan State University '78, M.M.; '82, Ph.D.

**Duffy, Lawrence E.** -- 1986 -- Associate Professor of Chemistry and Biochemistry (1986), IAB, CNS. Fordham University '69, B.S.; University of Alaska '71, M.S.; '77, 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.

**Eaton, William D.** -- 1987 -- Assistant Professor of Fish Pathology (1987), JCFOS. San Jose State University '80, B.A.; '82, M.A.; University of California, Davis '87, Ph.D.

**Ebbesson, Sven O.E.** -- 1985 -- Professor of Marine Science and Neuroscience (1985), IMS, SFOS. Southwestern College '57, B.S.; University of Maryland '64, Ph.D.

**Echelmeyer, Keith A.** -- 1984 -- Assistant Professor of Geophysics, (1984), GI, CNS. University of Colorado '76, B.S.; California Institute of Technology '79, M.S.; '83, Ph.D.

**Ellanna, Linda J.** -- 1986 -- Associate Professor of Anthropology (1988), CLA. University of Washington '66, B.A.; University of Wyoming '72, M.A.; University of Connecticut '83, Ph.D.

**Elsner, Robert** -- 1973 -- Professor Emeritus of Marine Science, Emeritus (1988), IMS, IAB, SFOS. New York University '50, B.A.; University of Washington '55, M.S.; '59, Ph.D.

**Fagan, Robert M.** -- 1982 -- Associate Professor of Biometrics (1982), JCFOS. Massachusetts Institute of Technology '67, B.S.; University of Michigan '68, M.S.; Harvard University '74, Ph.D.

**Fawson, Chris** -- 1987 -- Assistant Professor of Economics (1987), SOM. Texas A & M University '86, Ph.D.

**Fay, Francis H.** -- 1970 -- Professor of Marine Science (1983), IMS, IAB, SFOS. 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, SFOS, CNS. University of California at Los Angeles '48, A.B.; '51, M.A.; Stanford University '56, 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 Emeritus of Accounting (1988), SOM. University of Nebraska '58, B.S.; University of Denver '66, M.S.B.A.

**Follmann, Erich H.** -- 1976 -- Research Associate (1979), IAB, CNS. Loyola University, Chicago '65, B.S.; Southern Illinois University '68, M.A.; '73, Ph.D.

**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, CNS. Johns

- (1986), SOM. New York University '73, B.A.; Ohio State University '75, M.A.; '77, 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.
- French, John S.** -- 1980 -- Associate Professor of Seafood Biochemistry (1985), FITC. Oberlin College '71, A.B.; University of Michigan '79, Ph.D.
- Frentzen, Ann** -- 1983 -- Assistant Professor of Anthropology (1987), Participant, Cross Cultural Communications (1983), CLA. Macalester College '71, B.A.; School of International Training '75, M.A.; Teachers College, Columbia University '82, Ph.D.
- 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.
- Gabrielli, Ralph B.** -- 1987 -- Associate Professor of Education (1987), NWC, RC. State University of New York/United States Military Academy (West Point), '65, B.A.; State University of New York '66, M.S.; Syracuse University '71, 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.
- Gangloff, Roland** -- 1987 -- Associate Professor of Geology and Curator of Earth Science (1987), UAM, CNS. University of California, Berkeley '61, B.S.; '63, M.S.; '75, Ph.D.
- Gard, Richard** -- 1975 -- Professor of Fisheries (1978), JCFOS. University of California, Berkeley '50, B.A.; '53, M.A.; '58, Ph.D.
- Gasbarro, Anthony F.** -- 1973 -- Associate Professor of Forestry (1986), CES. 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.
- Geist, Charles R.** -- 1974 -- Professor of Psychology (1984), RC. University of San Diego '68, B.S.; University of Montana '73, M.A.; '75, Ph.D.
- Gharrett, Anthony J.** -- 1976 -- Associate Professor of Fisheries (1980), JCFOS. California Institute of Technology '67, B.S.; Oregon State University '73, M.S.; '75, Ph.D.
- Gilley, Otis** -- 1985 -- Associate Professor of Economics (1985), SOM. Purdue University '79, Ph.D.
- Gilmore, Perry** -- 1985 -- Associate Professor of Education (1985), RC. Temple University '66, B.S.; '76, M.S.; University of Pennsylvania '82, Ph.D.
- Gimbel, John** -- 1987 -- Assistant Professor of Mathematics (1987), CLA. Andrews University '77, B.S.; Western Michigan University '84, Ph.D.
- Gislason, Gary A.** -- 1970 -- Professor of Mathematics (1984), CLA. University of Alaska '66, B.S.; University of Oregon '68, M.S.; '70, Ph.D.
- Glasure, Yong U.** -- 1988 -- Visiting Assistant Professor of Economics (1988), SOM.

University of California, Santa Barbara '78, B.A.; '80, M.A.; Florida State University '87, Ph.D.

**Goering, John J.** -- 1962 -- Professor of Marine Science (1968), IMS, SFOS. Bethel College '56, B.S., University of Wisconsin '60, M.S.; '62, Ph.D.

**Gold, Carol** -- 1980 -- Associate Professor of History (1983), CLA. Antioch College '64, B.A.; University of Wisconsin '67, M.A.; '76, Ph.D.

**Gominho, Luis C.** -- 1988 -- Assistant Professor of Mechanical Engineering (1988), SOE. University of Lourenco Marques, Maputo Mozambique '75, B.S.; University of Rhode Island '82, M.S.; Ph.D.

**Gosink, Joan P.** -- 1979 -- Associate Professor of Geophysics (1986), GI, CNS. Massachusetts Institute of Technology '62, B.S.; Old Dominion University '73, M.S.; University of California, Berkeley '79, Ph.D.

**Grubis, Stephen F.** -- 1974 -- Associate Professor of Education (1985), RC. Bridgewater State College '66, B.A.; Alaska Methodist University '69, M.A.T.; University of Alaska '71, Ed.S.; Simon Fraser '80, Ph.D.

**Guthrie, R. Dale** -- 1963 -- Professor of Zoology (1970) Associate Faculty of Anthropology (1987), IAB, CNS. University of Illinois '58, B.S.; '59, M.S.; University of Chicago '63, Ph.D.

**Hagstrom, David** -- 1985 -- Associate Professor of Education (1985), RC. Grinnell College '57, B.A.; Harvard University '58, M.A.T.; University of Illinois '66, Ed.D.

**Halderson, Lewis J.** -- 1980 -- Associate Professor of Fisheries (1984), JCFS. University of Minnesota '63, B.A.; University of California, Santa Barbara '73, M.A.; '78, Ph.D.

**Hallinan, Thomas J.** -- 1965 -- Associate Professor of Geophysics (1981), GI, CNS. Cornell University '64, B.S.E.E.; University of Alaska '69, M.S.; '76, Ph.D.

**Hampton, Eber** -- 1986 -- Assistant Professor of Education (1986), RC. Westmont College '64, B.A.; Harvard Graduate School of Education '86, Ed.D.

**Hampton, Mary** -- 1988 -- Assistant Professor of Psychology (1988), RC. Valparaiso University '74, B.A.; Boston University '80, Ed.M.; Harvard University '87, Ed.D.

**Haneman, Vincent S.** -- 1980 -- Dean, School of Engineering and Professor of Mechanical Engineering (1980), SOE. Massachusetts Institute of Technology '47, B.S.; University of Michigan '50, M.S.E. (Ae); '56, Ph.D. (Ae.)

**Harbaugh, John P.** -- 1977 -- Assistant Professor of Trumpet (1988), CLA. University of Northern Iowa '75, B.A.; North Texas State University '77, M.M.E.

**Harris, Alice** -- 1980 -- Professor of English (1984), CLA. University of Chattanooga '67, B.A.; University of Tennessee '68, M.A.; '71, Ph.D.

**Harrison, Barbara G.** -- 1981 -- Assistant Professor of Cross-Cultural Education, Cross-Cultural Development Program (1981), RC. University of Illinois '67, B.A.; University of Alaska Fairbanks '79, M.A.T.; University Oregon '81, Ph.D.

**Harrison, William D.** -- 1972 -- Professor of Physics (1982), GI, CNS. Mt. Allison University '58, B.Sc.; University of London '60, B.Sc. (Special); California Institute of Technology '66, Ph.D.

**Hawkins, Daniel B.** -- 1967 -- Professor of Geology and Chemistry (1985), CNS. Montana State College '56, B.S.; '57, M.S.; Pennsylvania State University '61, Ph.D.

**Hawkins, Joseph G.** -- 1987 -- Assistant Professor of Electrical Engineering (1987),

SOE. University of Alaska '82, B.S.; Stanford University '84, M.S.; '87, Ph.D.

**Henrichs, Susan M.** -- 1982 -- Associate Professor of Marine Science (1982), IMS, SFOS. University of Washington '75, B.S.; Woods Hole Oceanographic Institution -- Massachusetts Institute of Technology Joint Program '80, Ph.D.

**Heyne, Eric** -- 1986 -- Assistant Professor of English (1986), CLA. University of Washington '78, B.A.; Ohio State University '82, M.A.; '84, Ph.D.

**Highsmith, Raymond C.** -- 1983 -- Associate Professor of Marine Science (1983), IMS, SFOS. University of Iowa '72, B.A.; University of Washington '79, Ph.D.

**Himelbloom, Brian H.** -- 1987 -- Assistant Professor of Seafood Microbiology (1987), FITC. Northern Illinois University '78, B.S.; Arizona State University '80, M.S.; North Carolina State University '85, Ph.D.

**Hoffman, David B.** -- 1985 -- Professor of Business Administration (1985), SOM. Gannon University '68, B.B.A.; University of Alaska Anchorage '72, M.B.A.; Kent State University '76, D.B.A.

**Holloway, Patricia S.** -- 1984 -- Assistant Professor of Horticulture (1984), SALRM. Millersville University '73, B.A.; Washington State University '76, M.S.; University of Minnesota '82, Ph.D.

**Hopkins, David M.** -- 1985 -- Distinguished Professor of Quaternary Studies (1985), Associate Faculty of Anthropology (1987), UAM, CNS. University of New Hampshire '42, B.S.; Harvard University '48, M.S.; '55, Ph.D.

**Hopkins, John R.** -- 1979 -- Assistant Professor of Music (1979), CLA. Beth College '69, B.A.; University of Iowa '76, M.A.; '82 D.M.A.

**Hoskins, Leo Claron** -- 1965 -- Professor of Chemistry (1975), CNS. Utah State University '62, B.S.; Massachusetts Institute of Technology '65, Ph.D.

**Huang, Scott L.** -- 1981 -- Associate Professor of Geological Engineering (1986), SME. Cheng-Kung University, Taiwan '74, B.S.; University of Kentucky '78, M.S.; University of Missouri, Rolla '81, Ph.D.

**Hulsey, J. Leroy** -- 1987 -- Associate Professor of Civil Engineering and Head, Department of Civil Engineering (1987), SOE. Missouri School of Mines and Metallurgy '65, B.S.; University of Missouri-Rolla '66, M.S.; '76, Ph.D.

**Husby, Fredric M.** -- 1975 -- Associate Professor of Animal Science (1980), AFES. Washington State University '66, B.S.; '69, M.S.; '73, Ph.D.

**Jaffe, Daniel A.** -- 1987 -- Assistant Professor of Chemistry (1987), GI, CNS. Massachusetts Institute of Technology '78, B.S.; University of Washington '83, M.S.; '87, Ph.D.

**Jayaweera, Kolf** -- 1970 -- Dean, College of Natural Sciences (1985), Professor of Geophysics (1981), GI, CNS. University of Ceylon '60, B.Sc.; University of London '65, Ph.D.

**Jevtic, Dusan B.** -- 1987 -- Assistant Professor Computer Science (1987), CLA. University of Belgrade '75, B.S.; '81, M.S.; Santa Clara University '87, Ph.D.

**Jiang, Ming** -- 1988 -- Assistant Professor of Computer Science (1988), CLA. National Taiwan University '82, B.S.; '84, M.S.; University of Illinois '88, Ph.D.

**Johansen, Nils I.** -- 1971 -- Associate Professor of Geological Engineering (1976), SME. Purdue University '66, B.S.C.E.; '67, M.S.C.E.; '71, Ph.D., P.E.

**Johnson, James** -- 1974 -- Professor of Music (1983), CLA. University of Arizona '70,

B.M.; '72, M.M.; '76, D.M.A.

**Johnson, Ronald A.** -- 1976 -- Professor of Mechanical and Environmental Quality Engineering (1985) and Head, Department of Mechanical Engineering (1988), SOE, Brown University '65, Sc.B.; Cornell University '66, M.S.; '69, Ph.D., P.E.

**Johnson, Walter R.** -- 1981 -- Assistant Professor of Marine Science (1981), IMS, SFOS. University of Miami '72, B.S.; '75, M.S.; University of Delaware '81, Ph.D.

**Johnston, Thomas F.** -- 1973 -- Professor of Music (1981), CLA. California State University, Hayward '68, M.A.; California State University, Fullerton '72, M.A.; Witwatersrand University, Johannesburg '72, Ph.D.

**Jordan, Richard H.** -- 1975 -- Head, Department of Anthropology and Professor of Anthropology (1988), CLA. Dartmouth College '69, B.A.; University of Minnesota '75, Ph.D.

**Jubenville, Alan** -- 1979 -- Professor of Resource Management (1988), SALRM. North Carolina State College '62, B.S.; West Virginia University '64, M.S.; University of Montana '70, Ph.D.

**Juday, Glenn Patrick** -- 1978 -- Assistant Professor of Plant Ecology (1981), SALRM. Purdue University '72, B.S.; Oregon State University '76, Ph.D.

**Kamath, Vidyadhar A.** -- 1983 -- Assistant Professor of Petroleum Engineering (1986), SME. University of Bombay '80, B.S.; University of Pittsburgh '82, M.S.; '83, Ph.D.

**Kan, Joseph R.** -- 1972 -- Professor of Geophysics (1981), GI, CNS. Cheng-Kung University '61, B.S.; Washington State University '66, M.S.; University of California, San Diego '69, Ph.D.

**Kane, Douglas L.** -- 1971 -- Professor of Water Resources and Civil Engineering (1986), INE, SOE. University of Wisconsin '66, B.S.C.E.; '68, M.S.C.E.; University of Minnesota '75, Ph.D., P.E.

**Karlsson, Meriam G.** -- 1988 -- Assistant Professor of Horticulture (1988), SALRM. The Swedish University of Agricultural Sciences '79, B.S.; Michigan State University '84, M.S.; '87, Ph.D.

**Katz, Richard** -- 1986 -- Professor of Psychology (1986), RC. Yale University '58, B.A.; Harvard University '65, Ph.D.

**Kawasaki, Koji** -- 1980 -- Assistant Professor of Geophysics (1981), GI, CNS. University of California, Berkeley '60, B.A.; University of Alaska '67, M.S.; '71, Ph.D.

**Keith, Kristen** -- 1988 -- Associate Professor of Economics (1988), SOM. University of Montana '81, B.A.; Ohio State University '84, M.A.; '88, Ph.D.

**Keller, John W.** -- 1979 -- Associate Professor of Chemistry and Biochemistry (1986), CNS. Ohio State University '68, B.S.; University of Wisconsin '76, Ph.D.

**Kelley, John J.** -- 1971 -- Associate Professor of Marine Science (1979), IMS, SFOS. Pennsylvania State University '58, B.S.; University of Nagoya, Japan '74, Ph.D.

**Keskinen, Mary J.** -- 1984 -- Assistant Professor of Geology (1988), CNS. Smith College '73, B.A.; Stanford University '79, Ph.D.

**Kienle, Juergen** -- 1965 -- Professor of Geophysics (1983), GI, CNS. Swiss Federal Institute of Technology E.T.H. '64, Diploma; University of Alaska '69, Ph.D.

**Kinney, Thomas C.** -- 1983 -- Associate Professor of Civil Engineering (1983), SOE. University of Washington '65, B.S.C.E.; '66, M.S.C.E.; University of Illinois '79, Ph.D.

**Kipphut, George W.** -- 1981 -- Assistant Professor of Marine Science (1981), IMS, SFOS. Providence College '69, B.S.; Columbia University '78, Ph.D.

**Kirts, Carla A.** -- 1981 -- Assistant Professor of Agricultural Education (1981), AFES, SALRM. Virginia Polytechnic Institute and State University '76, B.S.; '77, M.S.; University of Missouri-Columbia '81, Ph.D.

**Klein, David R.** -- 1962 -- Professor of Wildlife Management (1962) and Unit Leader, Alaska Cooperative Wildlife Unit, IAB, CNS. University of Connecticut '51, B.S.; University of Alaska '53, M.S.; University of British Columbia '63, Ph.D.

**Kleinfeld, Judith S.** -- 1969 -- Professor of Psychology (1978) and Head, Department of Education (1988), RC. Wellesley College '66, B.A.; Harvard University '67, Ed.M.; '69, Ed.D.

**Knight, Charles W.** -- 1978 -- Instructor of Agronomy (1978), SALRM. Kansas State University '70, B.S.; '71, M.S.; University of Alaska Fairbanks '88, Ph.D.

**Knocke, Peter** -- 1988 -- Associate Professor of Computer Science (1988), CLA. Dartmouth College '55, B.A.; '56, M.S.E.E.; Syracuse University '67, Ph.D.

**Kokjer, Kenneth J.** -- 1970 -- Senior Research Associate and Adjunct Associate Professor of Electrical Engineering (1988), IAB, SOE. Nebraska Wesleyan University '63, B.A.; University of Illinois '66, M.S.; '70, Ph.D.

**Kowalik, Zygmunt** -- 1981 -- Associate Professor of Marine Science (1984), IMS. Moscow University '61, M.S.; Institute of Water Engineering, Polish Academy of Sciences, Gdansk '65, Ph.D.

**Kwachka, Patricia** -- 1979 -- Assistant Professor of Anthropology (1987), Participant, Cross Cultural Communications, Alaska Native Programs (1979), CLA. University of Florida, Gainesville '64, B.A.; '70, M.A.; '82, Ph.D.

**Lambert, John P.** -- 1982 -- Associate Professor of Mathematics (1987), CLA. University of Cincinnati '64, B.S.; University of New Mexico '68, M.A.; Claremont Graduate School '82, Ph.D.

**Lando, Barbara M.** -- 1969 -- Professor of Mathematics (1982), CLA. Georgian Court College '62, B.A.; Rutgers University '64, M.S.; '69, Ph.D.

**Lando, Clifton A.** -- 1969 -- Associate Professor of Mathematics (1973) and Head, Department of Mathematics, CLA. Lehigh University '62, B.A.; Rutgers University '64, M.S.; '69, Ph.D.

**LaPerriere, Jacqueline Doyle** -- 1972 -- Associate Professor of Fisheries and Associate Professor of Water Resources (1985), INE, IAB. University of Massachusetts '64, B.S.; Iowa State University '71, M.S.; '81, Ph.D.

**Laursen, Gary A.** -- 1976 -- Affiliate Assistant Professor of Microbiology (1980), SALRM. Western Washington State University '65, B.A.; University of Montana '70, M.S.; Virginia Polytechnic Institute and State University '75, Ph.D.

**Lee, Jonah Y.H.** -- 1984 -- Assistant Professor of Mechanical Engineering (1984), SOE. Chung Yuan College '73, B.S.; South Dakota School of Mines and Technology '79, M.S.; Iowa State University '83, Ph.D.

**Lee, Jong S.** -- 1982 -- Director of Fishery Industrial Technology Center and Professor of Food Science (1982), SFOS. University of California, Berkeley '56, A.B.; Oregon State University '62, M.S.; '63, Ph.D.

**Lee, Lou-Chuang** -- 1978 -- Professor of Physics (1986), GI, CNS. National Taiwan University '69, B.S.; California Institute of Technology '72, M.S.; '75, Ph.D.



**Lehman, John A.** -- 1987 -- Associate Professor of Business Administration (1987), SOM. University of Michigan '72, B.A.; '73, M.A.; '77, M.B.A.; '82, Ph.D.

**Lewis, Carol E.** -- 1973 -- Associate Professor of Resource Management (1979), AFES, SALRM. University of Florida '62, B.S.; '64, M.S.; Georgetown University '71, Ph.D.; University of Alaska '76, M.B.A.

**Lieberman, Victor L.** -- 1985 -- Assistant Professor of Psychology (1985), RC. University of California, Berkeley '72, A.B.; Yale University '74, M.P.H.; University of California '79, M.A.; University of California, Berkeley '82, Ph.D.

**Lin, Hsing Kuang** -- 1986 -- Assistant Professor of Hydrometallurgy (1987), SME. National Cheng-Kung University '74, B.S.; '78 M.S.; University of Alaska '80, M.S.; University of Utah '85, Ph.D.

**Lindahl, Mary** -- 1986 -- Associate Professor of Business Administration (1987), SOM. Augustina College '72, B.A.; University of Illinois at Urbana-Champaign '74, M.S.; '75, Ph.D.

**Lipka, Jerry M.** -- 1981 -- Associate Professor of Education (1988) and Field Coordinator for the Cross-Cultural Education Development Program (1981), RC. City College, New York '66, B.B.A.; '69, M.B.A.; University of Massachusetts, Amherst '80, Ph.D.

**Lium, Marie** -- 1988 -- Associate Professor of English (1988), CLA. University of Washington, Seattle '72, B.A.; Vermont College '83, M.A.; University of Cambridge '87, M.Phil.

**Logan, Robert** -- 1986 -- Assistant Professor of Economics (1987), SOM. University of Iowa '86, Ph.D.

**Lokken, Donald A.** -- 1970 -- Associate Professor of Chemistry (1975), CNS. University of Wisconsin '63, B.A.; Iowa State University '70, Ph.D.

**Lull, Janis** -- 1986 -- Assistant Professor of English (1986), CLA. University of Oregon '67, B.A.; University of Minnesota '82, M.S.; '83, Ph.D.

**MacLean, Jr., Stephen F.** -- 1971 -- Professor of Zoology (1980), IAB, CNS. University of California, Santa Barbara '64, B.A.; University of California, Berkeley '69, Ph.D.

**Madsen, Eric C.** -- 1983 -- Assistant Professor of Education and Field Coordinator, Cross-Cultural Education Development Program (1983), RC. Kalamazoo College '68, B.A.; University of Alaska Fairbanks '79, M.A.T.; University of Oregon '83, Ph.D.

**Maneval, David R.** -- 1981 -- Professor of Mineral Beneficiation (1981), SME. Pennsylvania State University '50, B.S.; '57, M.S.; '61, Ph.D.

**Marum, Laurie** -- 1987 -- Assistant Professor of Social Work (1987), RC. University of Washington '79, B.A.; University of Denver '80, M.S.W.

**Mathisen, Ole A.** -- 1983 -- Professor of Fisheries (1983), JCFOS, SFOS. University of Oslo '45, Cand. real; University of Washington '55, Ph.D.

**Mayer, Charles E.** -- 1989 -- Assistant Professor of Electrical Engineering (1988), SOE. Colorado State University '77, B.S.E.E.; University of Southern California '79, M.S.; University of Alaska Fairbanks '88, Ph.D.

**McBeath, Jenifer H.** -- 1977 -- Associate Professor of Plant Pathology (1987), AFES, SALRM. National Taiwan University '68, B.S.; University of California, Davis '70, M.S.; Rutgers University '74, Ph.D.

**McFadden, Terry** -- 1974 -- Associate Professor of Mechanical and Arctic Engineering

(1983), SOE. Brigham Young University '60, B.E.S.M.E.; Stanford University '65, M.S.M.E.; University of Alaska '74, Ph.D., P.E.

**McKendrick, Jay D.** -- 1972 -- Associate Professor of Agronomy (1977), AFES, SALRM. University of Idaho '63, B.S.; '66, M.S.; Kansas State University '71, Ph.D.

**McRoy, C. Peter** -- 1969 -- Professor of Marine Science (1979), IMS, SFOS. Michigan State University '63, B.S.; University of Washington '66, M.S.; University of Alaska '70, Ph.D.

**Mendenhall, William W.** -- 1955 -- Professor Emeritus of Civil Engineering (1988), SOE. Cornell University '49, B.C.E.; '60, M.S.

**Merritt, Robert P.** -- 1955 -- Professor Emeritus of Electrical Engineering and Geophysics (1988), SOE. Oregon State College '49, B.S.; Stanford University '68, M.S.; P.E.

**Metz, Paul A.** -- 1975 -- Assistant Professor of Geological Engineering (1983), SME. Michigan Tech University '68, B.S.; University of Alaska '72, M.B.A.; '75, M.S.

**Milne, Clark R.** -- 1988 -- Lecturer in Engineering Management (1988), SOE. Cornell University '73, B.S.I.E.; University of Alaska '77, M.S.E.M.; '77, M.C.E.

**Milner, Laura M.** -- 1986 -- Assistant Professor of Business Administration (1986), SOM. University of Georgia '75, B.A.; Kansas State University '81, M.S.; '85, Ph.D.

**Mitchell, G. Allen** -- 1987 -- Associate Dean, School of Agriculture and Land Resources Management; Associate Director, Agricultural and Forestry Experiment Station (1987), AFES, SALRM. University of California, Riverside '71, B.S.; '73, M.S.; '77, Ph.D.

**Mohatt, Gerald V.** -- 1983 -- Professor of Psychology; Acting Dean, Rural College (1987), and Director, Center for Cross-Cultural Studies (1983), RC. St. Louis University '66, B.A.; '68, M.S.; Harvard University '78, Ed.D.

**Montoya, Valerie C.** -- 1986 -- Assistant Professor of Sociology (1986), RC. Brigham Young University '80, B.S.; Stanford University '83, M.A.

**Morack, John L.** -- 1968 -- Professor of Physics (1978) and Head, Department of Physics, CNS. Union College '61, B.S.; Oregon State University '68, Ph.D.

**Morgan, John** -- 1976 -- Professor of English (1984) and Acting Head, Department of English (1987), CLA. Harvard University '65, A.B.; University of Iowa '67, M.F.A.

**Morrow, Phyllis** -- 1987 -- Assistant Professor of Anthropology and Cross-Cultural Communications (1987), CLA. Harvard-Radcliffe '72, B.A.; Cornell University '76, M.A.; '87, Ph.D.

**Mull, Charles G.** -- 1984 -- Affiliate Assistant Professor of Geology (1984), CNS. University of Colorado '57, B.A.; '60, M.S.

**Murphy, Edward C.** -- 1983 -- Associate Professor of Zoology (1987), IAB, CNS. University of California, Berkeley '70, B.A.; University of Alaska Fairbanks '74, M.S.; University of Kansas '77, Ph.D.

**Murray, David F.** -- 1969 -- Professor of Botany (1978) and Curator, Herbarium (1970), UAM, CNS. Middlebury College '59, A.B.; University of Alaska Fairbanks '74, M.S.; University of Kansas '77, Ph.D.

**Murray, John** -- 1988 -- Visiting Assistant Professor of English (1988), CLA. University of Colorado at Denver '82, B.A.; University of Denver '88, M.A.

**Murray, John S.** -- 1967 -- Associate Professor of Physics (1971), CNS. Oregon State

University '60, B.S.; '66, M.S.; University of Alaska '68, Ph.D.

**Musgrave, David L.** -- 1974 -- Assistant Professor of Marine Science, IMS, SFOS. California Institute of Technology '74, B.S.; University of Alaska '78, M.S.; '83, Ph.D.

**Naidu, A. Sathy** -- 1969 -- Professor of Marine Science (1986), IMS, SFOS. Andhra University '59, B.S.; '60, M.S.; '68, Ph.D.

**Nash, Jeffrey C.** -- 1986 -- Adjunct Assistant Professor of Mechanical Engineering (1988), SOE. Cornell University '78, B.S.; University of Massachusetts '82, M.S.; Texas A&M '86, Ph.D.

**Naske, Claus-M.** -- 1965 -- Professor of History (1981) and Head, Department of History (1986), CLA. University of Alaska '61, A.B.; University of Michigan '64, M.A.; Washington State University '70, Ph.D.

**Nelson, Patricia A.** -- 1986 -- Assistant Professor of Education (1986), RC. Beloit College '68, B.A.; Northern Illinois University '76, M.S.; Eastern Michigan University '79, M.A.; Brigham Young University '85, Ed.D.

**Nestor, Ralph W.** -- 1974 -- Associate Professor and Head, Travel Industry management Program (1974), SOM. Cornell University '61, B.A.; '66, B.S.; '70, M.S.

**Newberry, Rainer J.** -- 1982 -- Associate Professor of Geology (1982), GI, CNS. Massachusetts Institute of Technology '75, B.S. Chemistry, B.S. Geology; Stanford University '78, M.S.; '80, Ph.D.

**Niebauer, H. Joseph** -- 1976 -- Associate Professor of Marine Science (1982), IMS, SFOS. University of Wisconsin, Madison '67, B.S.; '76, Ph.D.

**Nielsen, Hans C.S.** -- 1967 -- Professor of Geophysics (1982), GI, CNS. Royal Technical University of Denmark '65, M.S.

**O'Brien, J. Patrick** -- 1977 -- Associate Professor of Economics (1980), SOM. Auburn University '67, B.S.; '69, M.S.; Oklahoma State University '77, Ph.D.

**Ogbe, David O.** -- 1984 -- Assistant Professor of Petroleum Engineering (1984), SME. Louisiana State University '76, B.S.; '78, M.S.; Stanford University '83, Ph.D.

**Olen, M. Burton** -- 1980 -- Professor of Accounting (1980), SOM. University of North Dakota '65, B.S.B.A.; '66, M.S.; University of Oklahoma '76, Ph.D.

**Olson, John V.** -- 1979 -- Associate Professor of Geophysics (1983), GI, CNS. University of California, Los Angeles '62, B.A.; '63, M.S.; '70, Ph.D.

**O'Rourke, Patrick J.** -- 1970 -- Chancellor (1981). St. John's University '64, B.A.; Indiana State University '68, M.S.; University of Connecticut '77, Ph.D.

**Osterkamp, Thomas** -- 1969 -- Professor of Physics (1979), GI, CNS. Southern Illinois University '62, B.A.; Saint Louis University '64, M.S.; '68, Ph.D.

**Ostermann, Russell D.** -- 1981 -- Associate Professor of Petroleum Engineering (1986), SME, and Head, Department of Petroleum Engineering (1983), SME. University of Kansas, '74, B.S.; '80, Ph.D.

**Oswood, Mark W.** -- 1977 -- Associate Professor of Aquatic Biology (1983), IAB, CNS. Washington State University '71, B.S.; University of Montana '76, Ph.D.

**Pace, R. Kelley** -- 1986 -- Assistant Professor of Business Administration (1986), SOM. University of Georgia '85, Ph.D.

**Packee, Edmond C.** -- 1983 -- Assistant Professor of Forest Management (1983),

AFES, SALRM. University of Montana '62, B.S.F.; Yale University '63, M.F.; University of Minnesota '76, Ph.D.

**Panciera, Michael T.** -- 1988 -- Assistant Professor of Agronomy (Forages), SALRM. University of Guelph '77, B.S.; '79, M.S.; Pennsylvania State University '82, Ph.D.

**Parrett, William H.** -- 1979 -- Associate Professor of Education (1984), RC. Indiana University '72, B.S.; '73, M.S.; '79, Ph.D.

**Patterson, Dean J.** -- 1988 -- Visiting Professor of Electrical Engineering (1988), SOE. University of Adelaide '62, B.E.; '64, M.E.; '70, Ph.D.

**Perkins, Leroy** -- 1983 -- Assistant Professor of English (1983), CLA. University of New Mexico '68, B.A.; University of New York at Buffalo '75, Ph.D.

**Pessel, Garnet** -- 1987 -- Affiliate Assistant Professor of Geology (1987), CNS. California Institute of Technology '60, B.S.; '60, M.S.

**Phillip, Betty Anne P.** -- 1965 -- Associate Professor of Medical Science and Chemistry (1983), CNS. Agnes Scott College '52, B.A.; Yale University '54, M.S.; '60, Ph.D.

**Phillips, William G.** -- 1975 -- Professor of Business Administration (1975), SOM. Waynesbury College '52, B.S.; American Graduate School of International Management '58, B.F.T.; University of Nebraska '67, M.A.; '70, Ph.D.

**Piacenza, Robert J.** -- 1977 -- Professor of Mathematics (1988), CLA. University of Florida '67, B.S.; University of Miami '73, M.S.; '76, Ph.D.

**Pierce, Richard A.** -- 1956 -- Professor of History (1988), CLA. University of California, Berkeley '40, B.A.; '52, M.A.; '56, Ph.D.

**Ping, Chien Lu** -- 1982 -- Assistant Professor of Agronomy (1983), AFES. Chung Hsin University, Taiwan '65, B.Sc.; Washington State University '72, M.S.; '76, Ph.D.

**Plumley, Francis G.** -- 1988 -- Associate Professor of Marine Science, IMS, SFOS. Mars Hill College '73, B.S.; Auburn University '77, M.S.; University of Georgia '83, Ph.D.

**Possenti, Richard G.** -- 1966 -- Associate Professor of Psychology (1973), RC. St. Joseph College '51, B.S.; University of Alabama '55, M.A.

**Powers, W. Roger** -- 1971 -- Associate Professor of Anthropology (1976), CLA. Idaho State University '64, B.A.; University of Wisconsin '68, M.S.; '73, Ph.D.

**Price, Channon P.** -- 1987 -- Assistant Professor of Physics (1987), CNS. California Institute of Technology '76, B.S.; University of California at Santa Barbara '81, Ph.D.

**Proenza, Luis M.** -- 1987 -- Vice Chancellor for Research, Dean of the Graduate School, and Professor of Biology (1987), VCR, CNS. Emory University '65, B.A.; Ohio State University '66, M.A.; University of Minnesota '71, Ph.D.

**Pulpan, Hans** -- 1968 -- Associate Professor of Geophysics (1980), GI, CNS. Montanistische Hochschule Loeben, Austria '61, Dipl. Eng.; University of Illinois '64, M.S.; '68, Ph.D.

**Quang, Pham Kuan** -- 1986 -- Assistant Professor of Statistics (1986), CLA. University of Saigon '61, B.S.; Western Washington University '71, M.S.; University of California, Berkeley '74, Ph.D.

**Quinn II, Terrance J.** -- 1985 -- Associate Professor of Population Dynamics (1985), JCFOS. University of Colorado '73, B.A.; University of Washington '77, M.S.; '80, Ph.D.

**Raad, Lutfi** -- 1988 -- Associate Professor of Civil Engineering (1988), SOE. American

University of Beirut '71, B.E.; University of California, Berkeley '72, M.S.C.E.; '77, Ph.D.

**Rao, Nagabhushana M.S.** -- 1970 -- Professor of Sociology (1981) and Chair, Asian Studies (1974), RC. University of Mysore '57, B.A. (Hon.); '58, M.A.; Washington State University '74, Ph.D.

**Rao, Pemmasani Dharma** -- 1966 -- Professor of Coal Technology (1976) and Associate Director of MIRL (1985), SME. Andhra University '52, B.Sc.; '54, M.Sc.; Pennsylvania State University '59, M.S.; '61, Ph.D.

**Reeburgh, William S.** -- 1968 -- Professor of Marine Science (1977), IMS, SFOS. University of Oklahoma '61, B.S.; Johns Hopkins University '64, M.A.; '67, Ph.D.

**Rees, Manfred H.** -- 1958 -- Professor of Geophysics (1975), GI, CNS. West Virginia University '48, B.S.E.E.; University of Colorado '56, M.S.; '58, Ph.D.

**Reger, Richard D.** -- 1975 -- Affiliate Associate Professor of Geology (1984), CNS. University of Alaska Fairbanks '63, B.A.; '64, M.S.; Arizona State University '75, Ph.D.

**Reichardt, Paul B.** -- 1972 -- Professor of Chemistry (1981) and Head Department of Chemistry (1988), CNS. Davidson College '65, B.S.; University of Wisconsin '69, Ph.D.

**Reynolds, James B.** -- 1978 -- Associate Professor of Fisheries and Unit Leader, Alaska Cooperative Fishery Research Unit (1978), IAB, SFOS. Utah State University '61, B.S.; Iowa State University '63, M.S.; '66, Ph.D.

**Reynolds, Janice M.** -- 1988 -- Vice Chancellor for Academic Affairs (1988), VCAA. Central Michigan University '64, B.S.; Ohio State University '67, M.A.; '69, Ph.D.

**Rice, Michael L.** -- 1983 -- Dean, School of Management (1983) and Professor of Business Administration (1983), SOM. Florida State University, Tallahassee '71, B.S.; '72, M.B.A.; University of North Carolina, Chapel Hill '75, Ph.D.

**Riedl, Richard E.** -- 1981 -- Associate Professor of Education (1975), RC. Cornell College '67, B.A.; University of Akron '70, M.A.; Arizona State University '75, Ph.D.

**Roberts, Thomas D.** -- 1966 -- Professor Emeritus of Physics and Electrical Engineering (1974). Director, INE (1983), SOE. University of Alabama '59, B.S.; Oregon State University '65, Ph.D., P.E.

**Robinson, E. Thomas** -- 1974 -- Associate Professor of Accounting (1979), SOM. University of Wisconsin '67, B.B.A.; '71, M.S.; C.P.A.; '82, C.M.A.

**Roederer, Juan G.** -- 1977 -- Professor of Physics (1977), GI, CNS. University of Buenos Aires '52, Ph.D.

**Roth, Mitchell** -- 1983 -- Associate Professor of Computer Science (1983), CLA. Michigan State University '73, M.S.; University of Illinois '80, Ph.D.

**Royer, Susan B.** -- 1970 -- Assistant Professor of Mathematics (1975), CLA. Salem State College '61, B.S.; Texas A&M University '66, M.S.; '69, M.S.

**Royer, Thomas C.** -- 1969 -- Professor of Marine Science (1981), IMS, SFOS. Alton College '63, B.A.; Texas A&M University '66, M.S.; '79, Ph.D.

**Ruppert, James** -- 1981 -- Assistant Professor of English (1988), CLA. State University of New York '70, B.A.; Purdue University '72, M.A.; University of New Mexico '81, Ph.D.

**Sackinger, William M.** -- 1970 -- Associate Professor of Geophysics and Electrical Engineering (1971), GI, CNS. University of Notre Dame '59, B.S.; Cornell University '61, M.S.; '69, Ph.D., P.E.

- Santoni, Larry** -- 1988 -- Assistant Professor of Mathematics (1988), CLA. Oregon State University '72, B.A.; University of California, San Diego '74, M.A.; University of Michigan '88, Ph.D.
- Schall, Dennis G.** -- 1988 -- Assistant Professor of Education (1988), RC. Kearney State College '69, B.S.; '72, M.S.; University of Nebraska '77, Ph.D.
- Schamel, Douglas** -- 1975 -- Instructor of Biology (1980), CNS. Allegheny College '71, B.S.; University of Alaska Fairbanks '74, M.S.
- Schell, Donald M.** -- 1976 -- Associate Professor of Water Resources and Marine Science (1983), INE, IMS, SOE, SFOS. Southeastern Massachusetts University '62, B.S.; University of Alaska '64, M.S.; '71, Ph.D.
- Schimmel, Joshua T.** -- 1988 -- Assistant Professor of Biology (1988), CNS. University of California, Berkeley '87, Ph.D.
- Schuldiner, Michael** -- 1980 -- Associate Professor of English (1984), CLA. Goddard College '59, B.A.; Kent State '79, Ph.D.
- Schwaegerle, Kent E.** -- 1986 -- Assistant Professor of Botany (1986), IAB, CNS. Oberlin College '75, B.A.; Ohio State University '78, M.S.; University of Illinois '84, Ph.D.
- Scott, G. Richard** -- 1973 -- Professor of Anthropology (1986), CLA. Arizona State University, Tempe '68, B.A.; '73, Ph.D.
- Scott, H. Andrew** -- 1988 -- Visiting Associate Professor of Engineering Management (1988), SOE. Virginia Polytechnic Institute '44, B.S.Ch.E.; '47, M.S.Ch.E.
- Sedinger, James S.** -- 1985 -- Assistant Professor of Wildlife Ecology (1985), IAB, CNS. University of Washington '71, B.S.; University of California, David '83, Ph.D.
- Sengupta, Mritunjoy** -- 1983 -- Associate Professor of Mining Engineering (1983), SME. Indian School of Mines '64, M.S.; Columbia University '71, M.S.; '73, M.S.; Colorado School of Mines '82, Ph.D.
- Shapiro, Lewis H.** -- 1971 -- Associate Professor of Geology (1979), GI, CNS. South Dakota School of Mines and Technology '62, B.S.; University of Minnesota '71, Ph.D.
- Sharma, Ghanshyam D.** -- 1963 -- Director, Petroleum Development Laboratory (1984); Professor of Petroleum Engineering (1984), SME. Benares Hindu University '52, B.S.; Swiss Federal Institute of Technology '58, Diploma of Engineering Geology; University of Michigan '61, Ph.D.
- Sharratt, Brenton S.** -- 1986 -- Affiliate Professor of Soil Physics (1986), SALRM. Utah State University '78, B.S.; '80, M.S.; University of Minnesota '84, Ph.D.
- Shaw, David G.** -- 1973 -- Professor of Marine Science and Chemistry (1984), IMS, SFOS, CNS. University of California, Los Angeles '67, B.S.; Harvard University '69, A.M.; '71, Ph.D.
- Shaw, Diane L.** -- 1988 -- Instructor of Chemistry (1988), CNS. Boston State College '69, B.S.; Boston University '71, M.A.
- Shaw, Glenn E.** -- 1971 -- Professor of Geophysics (1981), GI, CNS. Montana State University '63, B.S.; University of Southern California '65, M.S.; University of Arizona '71, Ph.D.
- Shelton, Harris W.** -- 1971 -- Vice Chancellor for Student Affairs (1985), STUAFF. University of South Florida '65, B.A.; '67, M.A.; Florida State University '71, Ph.D.
- Shieh, Yeung-Nan** -- 1984 -- Associate Professor of Economics (1987), SOM. National

Taiwan University-Taipei '66, B.A.; University of Rochester, New York '76, M.A.; Texas A&M University '80, Ph.D.

**Shields, Gerald F.** -- 1975 -- Professor of Zoology (1985), IAB, CNS. Carroll College '66, B.A.; Central Washington State College '70, M.S.; University of Toronto '74, Ph.D.

**Shinkwin, Anne D.** -- 1971 -- Dean, College of Liberal Arts and Professor of Anthropology (1985), CLA. University of Connecticut '60, B.A.; George Washington University '64, M.A.; University of Wisconsin '75, Ph.D.

**Shirley, Thomas C.** -- 1987 -- Associate Professor of Marine Science (1987), JCFOs. Texas A&I University '69, B.S.; '74, M.S.; Louisiana State University '74, Ph.D.

**Shumaker, Peggy** -- 1979 -- Assistant Professor of English (1988), CLA. University of Arizona, Tucson '74, B.A.; '79, M.F.A.

**Sink, Cathy R.** -- 1980 -- Staff Counselor, Center for Health and Counseling and Assistant Professor of Psychology (1980), STUAFF, RC. University of California, Los Angeles '74, B.A.; Fuller Graduate School of Psychology '77, M.A.; '79, Ph.D. Licensed Psychologist '82.

**Skudrzyk, Frank J.** -- 1982 -- Professor of Mining Engineering (1982), MIRL, SME. University of Mining and Metallurgy, Cracov '68, Master Engineer in Mining Engineering; '73, Doctor of Technical Sciences.

**Smith, David M.** -- 1986 -- Professor of Education (1986), RC. Nyack College '56, B.S.; Hartford Seminary Foundation '65, M.A.; Michigan State University '69, Ph.D.

**Smith, Roger W.** -- 1984 -- Associate Professor of Physics (1984), GI, CNS. University of Exeter '63, B.S.; '67, Ph.D.

**Smith, Ronald L.** -- 1968 -- Professor of Zoology (1984) and Head Department of Biology and Wildlife (1988), CNS. Occidental College '64, B.A.; University of Miami '67, M.S.; '68, Ph.D.

**Smith, Thomas E.** -- 1978 -- Affiliate Professor of Mining Geology (1984), CNS. Stanford University '65, M.S.; University of Nevada '71, Ph.D.

**Smoker, William W.** -- 1978 -- Associate Professor of Fisheries (1985), JCFOs. Carleton College '67, B.A.; Oregon State University '70, M.S.; '82, Ph.D.

**Soos, Frank** -- 1986 -- Assistant Professor of Creative Writing (1986), CLA. Davidson College '72, A.B.; University of Arkansas '81, M.F.A.

**Sparrow, Elena B.** -- 1988 -- Affiliate Associate Professor of Soil Microbiology (1988), SALRM. University of the Philippines '62, B.S.; '79, M.S.; The Pennsylvania State University '82, Ph.D.

**Sparrow, Stephen D.** -- 1981 -- Associate Professor of Agronomy (1988), AFES. North Carolina State University '69, B.S.; Colorado State University '73, M.S.; University of Minnesota '81, Ph.D.

**Speck, Robert C.** -- 1984 -- Associate Professor of Geological Engineering (1984) and Head, Department of Mining and Geological Engineering (1988), SME. Franklin and Marshall College '68, A.B.; University of Missouri-Rolla '74, B.S.; '75, M.S.; '79, Ph.D.

**Speece, Mark** -- 1988 -- Assistant Professor of Business Administration (1988), SOM. University of Nebraska '74, B.A.; University of Arizona '81, M.A.; '87, Ph.D.; University of Washington '88, Ph.D.

**Spell, B. David** -- 1978 -- Assistant Professor of Electrical Engineering (1980), Affiliate Research Engineer (1979), GI, CNS. University of Washington '74, B.S.E.E.; '81,

M.S.E.E.; P.E.

**Sponder, Barry** -- 1987 -- Associate Professor of Education (1987), RC. Incarnate Word College '75, B.A.; Adelphi University '77, M.A.

**Stamnes, Knut** -- 1988 -- Professor of Physics (1988), GI, CNS. University of Oslo '69, B.S.; '72 M.S.; University of Colorado '78, Ph.D.

**Stark, David A.** -- 1971 -- Professor of English (1985), CLA. University of California, Los Angeles '65, B.A.; University of California, Irvine '69, M.F.A.

**Stech, David A.** -- 1972 -- Associate Professor of Music (1982), CLA. University of Minnesota '67, B.S.; Ohio State University '69, M.A.; Michigan State University '76, Ph.D.

**Stinson, Lillian Powers** -- 1972 -- Associate Professor of Education (1974), RC. University of Illinois '58, B.S.; '64, M.Ed.; '70, Ed.D.

**Stolzberg, Richard J.** -- 1978 -- Associate Professor of Chemistry (1982), CNS. Tufts University '69, B.S.; Massachusetts Institute of Technology '73, Ph.D.

**Stone, David B.** -- 1966 -- Professor of Geophysics (1977), GI, CNS. University of Keele '56, B.A.; University of Newcastle Upon Tyne '63, Ph.D.

**Stratton, Russell E.** -- 1983 -- Associate Professor of English (1983), CLA. Princeton University '60, A.B.; University of Southern Mississippi '76, M.A.; '79, Ph.D.

**Stringer, William J.** -- 1965 -- Associate Professor of Geophysics (1982), GI, CNS. New Mexico State University '62, B.S.; University of Alaska '71, Ph.D.

**Summerville, Suzanne** -- 1978 -- Professor of Music (1985), CLA. Randolph-Macon Woman's College '58, A.B.; Vienna Academy of Music '61, Diploma; University of Houston '68, M.M.; Freie University at Berlin '77, Dr.phil.

**Swanson, Ruthann B.** -- 1987 -- Assistant Professor of Food Science (1988), SALRM. University of North Carolina '77, B.S.; University of Tennessee '81, M.S.; '86, Ph.D.

**Swanson, Samuel E.** -- 1979 -- Associate Professor of Geology (1983) and Head, Department of Geology and Geophysics (1987), CNS. University of California, Davis '68, B.S.; '70, M.S.; Stanford University '74, Ph.D.

**Swift, Daniel W.** -- 1963 -- Professor of Physics (1972), GI, CNS. Haverford College '57, B.A.; Massachusetts Institute of Technology '59, M.S.

**Tabbert, Russell** -- 1972 -- Associate Professor of English (1975), CLA. University of Iowa '63, B.A.; '69, Ph.D.

**Tanaka, Hiroshi L.** -- 1988 -- Assistant Professor of Physics (1988), CNS. University of Tsukuba, Japan '80, B.Sci.; University of Missouri-Columbia '88, Ph.D.

**Tape, Walter** -- 1982 -- Associate Professor of Mathematics (1979), CLA. Princeton University '62, B.A.; University of Michigan '68, Ph.D.

**Taylor, John N.** -- 1982 -- Associate Professor of Business Administration (1982), SOM, and Alaska Native Studies (1983), CLA, SOM. Military Academy '60, B.S.; Air Force Institute of Technology '69, M.S.; George Washington University '75, D.B.A.

**Taylor, Paul C.** -- 1980 -- Associate Professor of Finance (1980), SOM. University of Kansas '70, B.S.; '73, M.A.; '75, Ph.D.

**Thomas, Dana L.** -- 1981 -- Associate Professor of Statistics (1987), CLA. University of Alaska '74, B.S.; Oregon State University '78, M.S.; '82, Ph.D.



**Thomas, Monica E.** -- 1971 -- Assistant Professor of Economics (1977) and Head, Department of Economics (1988), SOM, Miami University '63, A.B.; Washington State University '70, M.A.

**Thomas, Wayne C.** -- 1971 -- Professor of Economics (1982), SALRM, California State Polytechnic College '65, B.S.; University Nevada '67, M.S.; Washington State University '71, Ph.D.

**Thompson, Steven K.** -- 1984 -- Assistant Professor of Statistics (1984), CLA, University of California '70, A.B.; Oregon State University '76, M.S.; '82, Ph.D.

**Tiedemann, James B.** -- 1966 -- Professor Emeritus of Mechanical Engineering (1987), SOE, University of Wisconsin '45, B.S.; '49, M.S.; '55, Ph.D.

**Tilsworth, Timothy** -- 1970 -- Professor of Environmental Quality Engineering and Civil Engineering (1984) and Coordinator of Environmental Quality Engineering Program (1988), SOE, University of Nebraska '66, B.S.C.E.; '67 M.S.C.E.; University of Kansas '70, Ph.D.

**Triplehorn, Don M.** -- 1969 -- Professor of Geology (1977), CNS, Ohio Wesleyan University '56, B.A.; Indiana University '57, M.A.; University of Illinois '61, Ph.D.

**Tumeo, Mark A.** -- 1988 -- Assistant Professor of Civil Engineering (1988), SOE, University of Notre Dame '81, B.S.C.E.; '81, B.S.; University of California, Davis '82, M.S.C.E.; '88, Ph.D.

**Turner, A. John L.** -- 1966 -- Professor of Education (1970), RC, McMurry College '51, B.S.; North Texas State University '55, M.Ed.; New Mexico State University '66, Ed.S.

**Van Cleve, Keith** -- 1967 -- Professor of Forestry (Soils) (1976), AFES, SALRM, University of Washington '58, B.S.; University of California, Berkeley '60, M.S.; '67, Ph.D.

**Van Veldhuizen, Philip A.** -- 1963 -- Professor Emeritus of Mathematics (1988), CLA, Central College '52, B.A.; State University of Iowa '60, M.S.

**Walker, Cynthia L.** -- 1977 -- Associate Professor of English (1982), CLA, Denison University '70, B.A.; Purdue University '72, M.A.; '74, Ph.D.

**Walker, Gerald G.** -- 1987 -- Assistant Professor of Electrical Engineering (1988), SOE, Colorado State University '77, B.S.E.E.; University of Southern California '79, M.S.; University of Alaska Fairbanks '88, Ph.D.

**Wallace, Wesley K.** -- 1985 -- Assistant Professor of Geology (1985), CNS, Rice University '72, B.A.; University of Washington '76, M.S.; '81, Ph.D.

**Walsh, Daniel E.** -- 1982 -- Instructor of Mineral Processing (1984), SME, University of Alaska '81, B.S.; '85, M.S.; P.E.

**Watkins, Brenton J.** -- 1980 -- Associate Professor of Geology (1985), GI, CNS, University of Adelaide '69, B.S.; La Trobe University '72, M.S.; University of Alaska '76, Ph.D.

**Watts, Keith F.** -- 1985 -- Assistant Professor of Geology (1985), CNS, Utah State University '78, B.S.; University of California '85, Ph.D.

**Weeden, Robert B.** -- 1967 -- Professor of Resource Management (1976), SALRM, CNS, University of Massachusetts '53, B.S.; University of Maine '55, M.S.; University of British Columbia '59, Ph.D.

**Weeks, Wilford F.** -- 1986 -- Professor of Geophysics (1986), GI, CNS, University of Illinois '51, B.S.; '53, M.S.; University of Chicago '56, Ph.D.

- Weller, Gunter E.** -- 1968 -- Professor of Geophysics (1973) GI, CNS. University of Melbourne '62, B.S.; '64, M.S.; '67, Ph.D.
- Wendler, Gerd** -- 1966 -- Professor of Geophysics (1982), GI, CNS. University of Innsbruck '64, D.Phil.
- Wescott, Eugene** -- 1958 -- Professor of Geophysics (1974), GI, CNS. University of California, Los Angeles '55, B.A.; University of Alaska '60, M.S.; '64, Ph.D.
- White, Robert Gordon** -- 1970 -- Professor of Zoophysiology and Nutrition (1981), IAB, CNS. University of Melbourne '62, B.Agr.S.; University of New England '68, M.Rur.S.; '73, Ph.D.
- Whitehead, John S.** -- 1978 -- Professor of History (1984), CLA. Yale '67, B.A.; '69, M.A.; '71, Ph.D.; University of Cambridge '72, M.A.
- Wichmann, Henry** -- 1986 -- Professor of Accounting (1986), SOM. University of Denver '62, B.S.; Colorado State College '64, M.A.; University of Northern Colorado '84, Ph.D.
- Williamson, Francis L.** -- 1986 -- Director, Institute of Arctic Biology and Professor of Biology (1986), IAB, CNS. San Diego State University '50, B.S.; University of California, Berkeley '55, M.A.; Johns Hopkins University '68, D.Sc.
- Willson, Warrack** -- 1988 -- Visiting Associate Professor of Coal Science and Technology (1988), SME. University of North Colorado '65, B.A.; University of Wyoming '70, Ph.D.
- Wiltse, Milton A.** -- 1979 -- Affiliate Associate Professor of Geology (1984), CNS. University of Pennsylvania '64, B.S.; Indiana University '66, M.S.; '68, Ph.D.
- Windschitl, Paul M.** -- 1987 -- Assistant Professor of Animal Science (1987), AFES, SALRM. South Dakota University '81, B.S.; '83, M.S.; University of Minnesota '86, Ph.D.
- Wooding, Frank** -- 1970 -- Professor of Agronomy (1982), AFES, SALRM. University of Illinois '63, B.S.; Kansas State University '66, M.S.; '69, Ph.D.
- Workman, Jolene J.** -- 1987 -- Assistant Professor of Education (1987), RC. Utah State University '65, B.S.; '67, M.S.; Brigham Young University '77, Ph.D.
- Workman, William G.** -- 1973 -- Associate Professor of Resources Management (1987), SALRM. University of Wyoming '69, B.S.; Utah State University '72, M.A.; '73, Ph.D.
- Wright, Gordon Brooks** -- 1969 -- Professor of Music (1974), CLA. College of Wooster '57, B.M.; University of Wisconsin '61, M.A.
- Yarie, John A.** -- 1978 -- Assistant Professor of Silviculture and Forest Soils (1983), AFES. West Virginia University '71, B.S.; University of Maine '74, M.S.; University of British Columbia '78, Ph.D.
- Yen, Tze-Yi (Steven)** -- 1987 -- Visiting Assistant Professor of Economics (1987), SOM. National Taiwan University '77, B.S.; University of Minnesota '87, Ph.D.
- Zach, Howard** -- 1970 -- Associate Professor of Business Administration (1974), SOM. Colorado State University '64, B.S.; '66, M.S.
- Zarling, John P.** -- 1976 -- Director, Institute of Northern Engineering, Head, Department of Mechanical Engineering and Professor of Mechanical Engineering (1981), INE, SOE. Michigan Technological University '64, B.S.M.E.; '66, M.S.E.M.; '71, Ph.D.E.M., P.E.

---

# UNIVERSITY OF ALASKA FAIRBANKS OFFICERS

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

Campus Information -- (907) 474-7211

Chancellor, Patrick J. O'Rourke  
Vice Chancellor for Academic Affairs, Janice M. Reynolds  
Vice Chancellor for Research and Dean of the Graduate School, Luis M. Proenza  
Vice Chancellor for Student Affairs, Harris Shelton  
Vice Chancellor for Administration, Jerome L. Trojan

College of Liberal Arts, Anne Shinkwin, Dean  
Alaska Native Language Center, Michael Krauss, Director  
Honors Program, Patricia Andresen, Director  
Public Broadcasting, Bruce Smith, General Manager

College of Natural Sciences, Kolf Jayaweera, Dean  
University of Alaska Museum, E. James Dixon, Acting Director

College of Rural Alaska, Gerald Mohatt, Acting Dean  
Bristol Bay Campus, Peggy Wood, Director  
Center for Cross-Cultural Studies, Gerald Mohatt, Director  
Chukchi Campus, Lynn Johnson, Director  
Interior Campus, Wendy Esmaika, Director  
Kuskokwim Campus, Lamont Albertson, Director  
Northwest Campus, Nancy Mendenhall, Director  
Rural Centers, Patricia Bruneau-Gaber, Coordinator

School of Agriculture and Land Resources Management, James V. Drew, Dean  
Agricultural and Forestry Experimental Station, James V. Drew, Director  
Cooperative Extension Services, Irvin Skelton, Acting Director

School of Career and Continuing Education, Patricia Book, Acting Dean

School of Engineering, Vincent S. Haneman, Jr., Dean  
Institute of Northern Engineering, John Zarling, Director

School of Fisheries and Ocean Sciences, Vera Alexander, Acting Dean  
Alaska Sea Grant College Program, Ronald Dearborn, Director  
Fishery Industrial Technology Center, Jong S. Lee, Director  
Institute of Marine Science, Vera Alexander, Director  
Juneau Center for Fisheries and Ocean Sciences, Thomas Smith, Acting  
Director  
Marine Advisory Program, Donald Kramer, Chair

School of Management, Michael L. Rice, Dean

School of Mineral Engineering, Donald Cook, Dean  
Mineral Industry Research Laboratory, Donald Cook, Director  
Petroleum Development Laboratory, G. D. Sharma, Director

Geophysical Institute, Syun-ichi Akasofu, Director  
Institute of Arctic Biology, Francis S. L. Williamson, Director

Accounting and Business Operations, Cary M. Lu, Director	474-7301
Admissions and Records, Ann Tremarello, Director	474-7521
	or 474-7821
Alumni Relations, Pat Schmidt, Director	474-7081
Athletics, Lynn Lashbrook, Director	474-7205
Budget and Cost Records, Betty Hoch, Director	474-6425
Conferences and Institutes, Nancy Bachner, Acting Director	474-7800
Employee Relations, Cathi Carr-Lundfelt, Director	474-7349
Faculty Senate, David Smith, President	474-7964
Fire Department, Vern Long, Chief	474-7721
Graduate School, Mary Ann Borchert, Coordinator	474-7464
Grant and Contract Services, Cary M. Lu, Director	474-7301
International Programs, Jean Aigner, Director	474-5327
Libraries, Paul McCarthy, Acting Director	474-7224
Physical Plant, John Phillips, Director	474-7617
Planning and Information Systems, John S. Wasileski, Director	474-6638
Purchasing, Terry Kelly, Director	474-7315
Security, Dale Florian, Director	474-7721
Sponsored Programs, Dorothy Yates, Director	474-7314
Student Affairs	474-7317
Lee Peters, Residence Life	
Bob Egan, Career Planning & Placement	
William Connor, Health & Counseling Center	
Eric Jozwiak, Housing Office	
Patty Kastelic, Student Relations	
Ron Keyes, Assistant to the Vice Chancellor for Student Affairs	
Greg Snoddy, International Student Advisor	
Summer Sessions, Charles Ray, Director	474-7021
University Relations, Karen L. Cedzo, Director	474-7581
Utilities Operation, Gerald England, Director	474-7351

## UNIVERSITY OF ALASKA BOARD OF REGENTS

Ann T. Parrish, President, Anchorage, 1983-1991  
 Robert F. Williams, Vice President, Kenai, 1985-1993  
 Ruth E. Burnett, Treasurer, Fairbanks, 1983-1991  
 Gordon E. Evans, Secretary, Juneau, 1983-1991  
 Donald B. Abel, Jr., Past President, Juneau, 1975-1981, 1981-1989  
 Marcus R. Clapp, Fairbanks, 1988-1993  
 Judith J. Graham, Anchorage, 1983-1989  
 Mark H. Helmericks, Anchorage, 1987-1995  
 Roy M. Huhndorf, Past President, Anchorage, 1983-1991  
 Edward B. Rasmuson, Past President, Anchorage 1975-1981, 1981-1989  
 Susan A. Stitham, Fairbanks, 1987-1995  
 Donald O'Dowd, President of the University, Ex-Officio Member

## INDEX

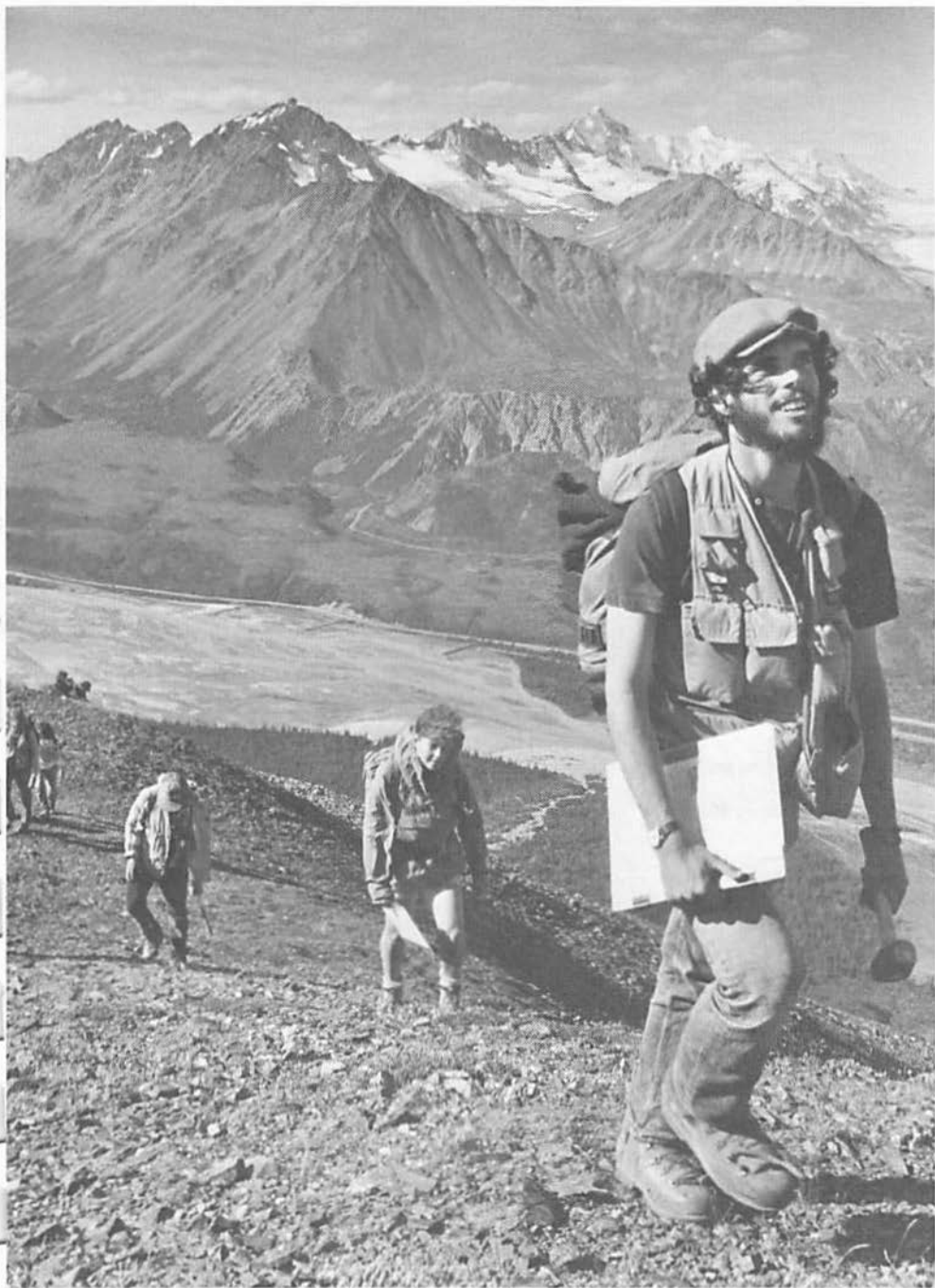
- Abstract, 57  
     publication, 57  
 Academic and Research Support, 23  
 Academic regulations, 47  
 Access to records, 47  
 Accounting, 109  
     courses, 109  
 Accreditation, 1  
 Admission processing fee, 27  
 Admission, 5  
     applying for admission, 6  
     foreign students, 5  
     English language proficiency policy,  
         5  
 Advancement to candidacy, 52  
     Doctor of Philosophy, 52  
     Master's degree, 52  
 Advisory committee, 50  
     composition, 50  
     responsibility, 51  
 Agricultural and Forestry Experiment  
     Station, 17  
 Agriculture and Land Resources  
     courses, 110  
 Alaska Cooperative Fishery and Wildlife  
     Research Units, 17  
 Alaska Native Languages  
     courses, 112  
 Alaska Native Studies  
     courses, 113  
 Alaska student loans, 36  
 Alaska Teacher Placement, 44  
 Alumni services, 44  
 Anthropology, 59  
     courses, 113  
     M.A., 60  
     Ph.D., 60  
 Application for admission, 6  
 Application for graduation, 58  
 Arctic Engineering, 89  
 Art  
     courses, 116  
 Athletics and recreation, 44  
 Atmospheric Sciences, 67, 72  
     Ph.D., 73  
 Attendance, 48  
 Auditing, 48  
 Automobiles, 39  
 Biological Sciences, 68  
     M.A.T., 68  
     M.S., 68  
     Ph.D., 68  
 Biology, 68  
     courses, 117  
 Botany, 68  
     courses, 120  
 Bureau of Mines, 24  
 Business Administration, 99  
     courses, 121  
     M.B.A., 99  
 Campus activity fee, 27  
 Career planning and placement, 45  
 Center for Cross-Cultural Studies, 18  
 Center for Health and Counseling, 45  
 Change of grade policy, 48  
 Chemistry, 68  
     courses, 123  
     M.A.T., 69  
     M.S. or M.A., 69  
 Civil Engineering, 90  
     courses, 125  
     M.S., 91  
     water resources and hydrology, 90  
 College observatory, 25  
 College of Liberal Arts, 59  
 College of Natural Sciences, 67  
     graduate degrees, 67  
 College Student Personnel  
     Administration  
         courses, 127  
 College Student Personnel  
     Administration, 75, 80  
 Commencement, 58  
 Community Psychology, 75  
     alcohol and drug abuse, 77  
 Comprehensive examination, 53  
 Computer Network, 24  
 Computer Science, 60  
     courses, 128  
 Computer Support Group, 24  
 Conditional acceptance, 7  
 Copyright, 56  
 Counseling  
     courses, 130  
 Course credits, 109  
 Course description, 109  
 Credit by examination fee, 27  
 Defense of thesis examination, 53  
 Degree requirements, 9  
     catalog and time limits, 10  
     Doctor of Philosophy, 13  
     English requirement, 10  
     general, 9  
     graduate, 10  
     Master of Arts in Teaching, 11, 12  
     Master's degree, 10  
 Department of Behavioral Sciences and  
     Human Services, 75  
 Diplomas, 58  
 Disabled students, 43  
 Disqualification from study, 50  
 Dissertation Abstracts International, 57

- Doctor of Philosophy Degree, 3, 13, 52
- Drop/add policy, 48
- Economics, 101
  - courses, 131
  - resource economics, 101
- Education, 80
  - courses, 132
- Educational Specialist Degree, 12, 83
- Electrical Engineering, 91
  - courses, 137
  - M.E.E. Degree, 91
  - M.S., 92
- Elmer E. Rasmuson Library, 23
- Emergency loans, 36
- Engineer of Mines Degree, 12, 105
- Engineering and Science Management, 92
  - courses, 139
  - M.S., 92
- Engineering Science
  - courses, 138
- English language proficiency policy, 5
- English, 61
  - courses, 140
  - M.A., 62
  - M.F.A., 62
- Environmental Quality Engineering and Science, 93
  - courses, 142
- Eskimo
  - courses, 143
- Examination committee, 53
- Examinations, 52
  - comprehensive examination, 53
  - defense of thesis examination, 53
  - examination committee, 53
  - outside examiner, 54
  - placement examination, 52
  - qualifying examinations, 52
  - report on examination, 54
- Extended registration fee, 27
- Extended registration, 9, 57
- Family housing, 42
  - eligibility, 42
  - activity fee, 27
  - admission processing fee, 27
  - credit by examination fee, 27
  - extended registration fee, 27
  - housing, 41
  - housing fees, 28
  - late placement and guidance test fee, 28
  - late registration fee, 28
  - material use fees, 29
  - music course fees, 29
  - parking fee, 29
  - payment of fees, 30
  - refunds, 30
  - student health insurance fee, 27
  - textbooks, 28
  - thesis submission and binding fee, 56
  - transcript fee, 28
- Fellowships, 35
- Final acceptance, 7
- Final examination, 53
- Financial aid, 33
  - deadlines, 33
  - eligibility, 33, 34
  - loans, 34, 35
  - research and teaching assistantships, 35
  - scholarships and fellowships, 35
  - types available, 34
- Financial obligations, 30
- Fisheries Program, 96
- French
  - courses, 144
- General Science, 69
- Geography
  - courses, 144
- Geological Engineering, 103
  - courses, 145
- Geology, 70
  - courses, 146
  - economic geology option, 70
  - general geology option, 70
  - M.A.T., 71
  - M.S., 70
- Geophysical Institute, 18
- Geophysics
  - courses, 146
  - M.S., 71
  - Ph.D., 71
  - snow, ice and permafrost option, 71
  - solid-earth option, 71
- Geoscience
  - courses, 146
- German
  - courses, 150
- Grade point average, 49
  - minimal acceptable grades, 50
- Graduate advisory committee, 50
- Graduate Council, 2
- Graduate degree programs, 14
- Graduate Record Examination (GRE), 6 Fees, 27
- Graduate Study Plan, 51
- Graduation, 58
  - application, 58
  - commencement, 58
  - diplomas, 58
  - student responsibility, 58
- Guidance Test Fee, 28
- Guidance and Counseling, 75, 77
  - certification, 77
  - elementary endorsement, 79
  - secondary endorsement, 79
- History, 63
  - courses, 150
  - M.A.T., 63
  - M.B.A., 99
- Honor code, 47

- Housing**  
 application procedures, 40  
 automobiles, 39  
 contracts, 41  
 deadlines, 39  
 eligibility, 39  
 family, 42  
 fees, 41  
 information, 39  
 refunds, 31  
 restrictions, 39  
 room assignments, 39  
 rooms, 39
- Housing fees, 28**  
 meal ticket, 28  
 room deposit, 28  
 room rent, 28
- Housing Office, 42**
- Human Services**  
 courses, 151
- Humanities**  
 courses, 152
- Immunization policy, 7**
- Institute of Arctic Biology, 19**
- Institute of Marine Science, 20**
- Institute of Northern Engineering, 20**
- Institute of Northern Forestry, 25**
- Interdisciplinary Programs, 3**
- International Student Advisor, 45**
- Intramural sports, 44**
- Japanese**  
 courses, 152
- Journalism -- Broadcasting**  
 courses, 152
- Juneau Center for Fisheries and Ocean Sciences, 21**
- Justice**  
 courses, 153
- Language/research tool, 54**
- Late Placement fee, 28**
- Late registration fee, 28**
- Letters of recommendation, 6**
- Library, 23**
- Linguistics**  
 courses, 153
- Loans, 34, 35**  
 Alaska Student Loans, 36  
 emergency loans, 36  
 parent loan, 35  
 supplemental loans for students, 35  
 the guaranteed/federally insured student loan, 35  
 University loans, 36
- Location, 1**
- Major, 51**  
 change of major, 57
- Marine Biology, 98**
- Marine Science and Limnology, 96**
- Master of Arts in Teaching, 11**
- Master of Education, 81**  
 certification, 82
- Master's degree, 2, 10, 52**
- Material use fees, 29**
- Mathematics, 63**  
 courses, 156  
 M.A.T., 63  
 M.S., 63  
 Ph.D., 64
- Meal ticket, 28, 41**
- Mechanical Engineering, 94**  
 courses, 158
- Media Program, 23**
- Memberships, 1**
- Microfilming, 56**  
 fee, 56
- Military Science, 160**
- Mineral Industry Research Laboratory, 21**
- Mineral Preparation Engineering**  
 courses, 106, 160
- Mining and Geological Engineering, 102**
- Mining Engineering**  
 courses, 104, 161
- Museum Studies, 163**
- Music course fees, 29**
- Music, 64, 163**  
 applied music, 163  
 M.A., 64  
 M.A.T., 65  
 music ensembles and class lessons, 163  
 music theory, music history, and music education, 163
- Natural Resources Management, 87**
- Oceanography, 97**  
 Ph.D., 98  
 Organization, 2
- Outside examiner, 54**
- Parent loan, 35**
- Parking fee, 29**
- Petroleum Development Laboratory (PDL), 22**
- Petroleum Engineering, 106**  
 courses, 165  
 petroleum geology option, 70  
 Ph.D., 71
- Philosophy**  
 courses, 166
- Physical Education**  
 courses, 166
- Physics, 71**  
 atmospheric sciences, 72  
 courses, 167  
 M.A.T., 72  
 M.S., 72  
 Ph.D., 73  
 space physics, 72
- Placement examination, 52**
- Political Science**  
 courses, 169
- Preregistration deposit, 29**
- Psychology**

- courses, 170
- Qualifying examinations, 52
- Records duplication charge, 29
- Refunds, 30
  - fees, 30
  - housing, 31
  - room deposit, 41
  - tuition, 30
- Registration, 57
  - extended registration, 57
  - regulations, 57
- Report on examination, 54
- Requests
  - for exceptions, 58
- Requirements for good standing, 47
- Research assistantships, 35, 37
- Research, 17
- Residence hall fees
  - room deposit, 41
  - room rent, 41
- Residence Halls, 39
- Residency information, 29
- Room deposit, 28, 41
  - refund, 41
- Room rent, 28
- Rural College, 75
- Rural Development
  - courses, 174
- Russian
  - courses, 175
- Scholarships, 35
- Scholastic records, 6
- School of Agriculture and Land
  - Resources Management, 86
- School of Engineering, 88
- School of Fisheries and Ocean Sciences, 95
- School of Management, 98
- School of Mineral Engineering, 102
- Social Work
  - courses, 175
- Sociology
  - courses, 175
- Space Physics, 72
  - Ph.D., 73
- Spanish
  - courses, 176
- Special mission, 1
- Special summer activities, 46
  - institutes, 46
  - recreation program, 46
- Speech Communication
  - courses, 177
- State and Federal Agencies, 24
- Statistics
  - courses, 177
- Student health insurance fee, 27
  - Student responsibility, 47
- Student rights, 2, 43
- Student teaching, 85
- Submission of thesis, 55
- Summer sessions, 43
- Supplemental student loans for
  - students, 35
- Teaching assistantships, 35, 37
- Textbooks, 28
- The Alaska Native Language Center, 18
- The Graduate Program, 2
- The Office of Student Financial Aid, 33
- The Women's Center, 46
- Theater
  - courses, 178
- Thesis
  - abstract for publication, 57
  - approval process, 56
  - copyright, 56
  - microfilming, 56
    - fee, 56
  - submission, 55
  - submission and binding fee, 56
  - submission deadlines, 55
- Time limits, 10, 50
- Transcript fee, 28
- Transportation Research Laboratory, 25
- Transportation, 1
- Tuition, 27
- Type B Administrative Certificate, 82
- University loans, 36
- University Microfilms International, 56
- University of Alaska Museum, 22
- USGS, 24
- Virology-Rabies Unit, 26
- Water Research Center (WRC), 21
- WICHE, 3
- Wildlife Management, 73
  - courses, 178
  - Ph.D., 74
- Withdrawal, 48
- Wood Center, 44
- Work and study loads, 38
- WRGP, 3
- Zoology, 68





Craig Schneider (right), a senior geology major, and Gina Cruse, a senior geophysics major, lead a group of summer geology field camp participants to the top of Miller Mountain in the Alaska Range. UAF photo/Sam Winch







# UNIVERSITY OF ALASKA FAIRBANKS

Admissions and Records  
Suite 102, Signers' Hall  
Fairbanks, Alaska  
99775-0060  
(907) 474-7821

Non-Profit  
Organization  
U.S. Postage  
PAID

Fairbanks, Alaska  
Permit No. 2