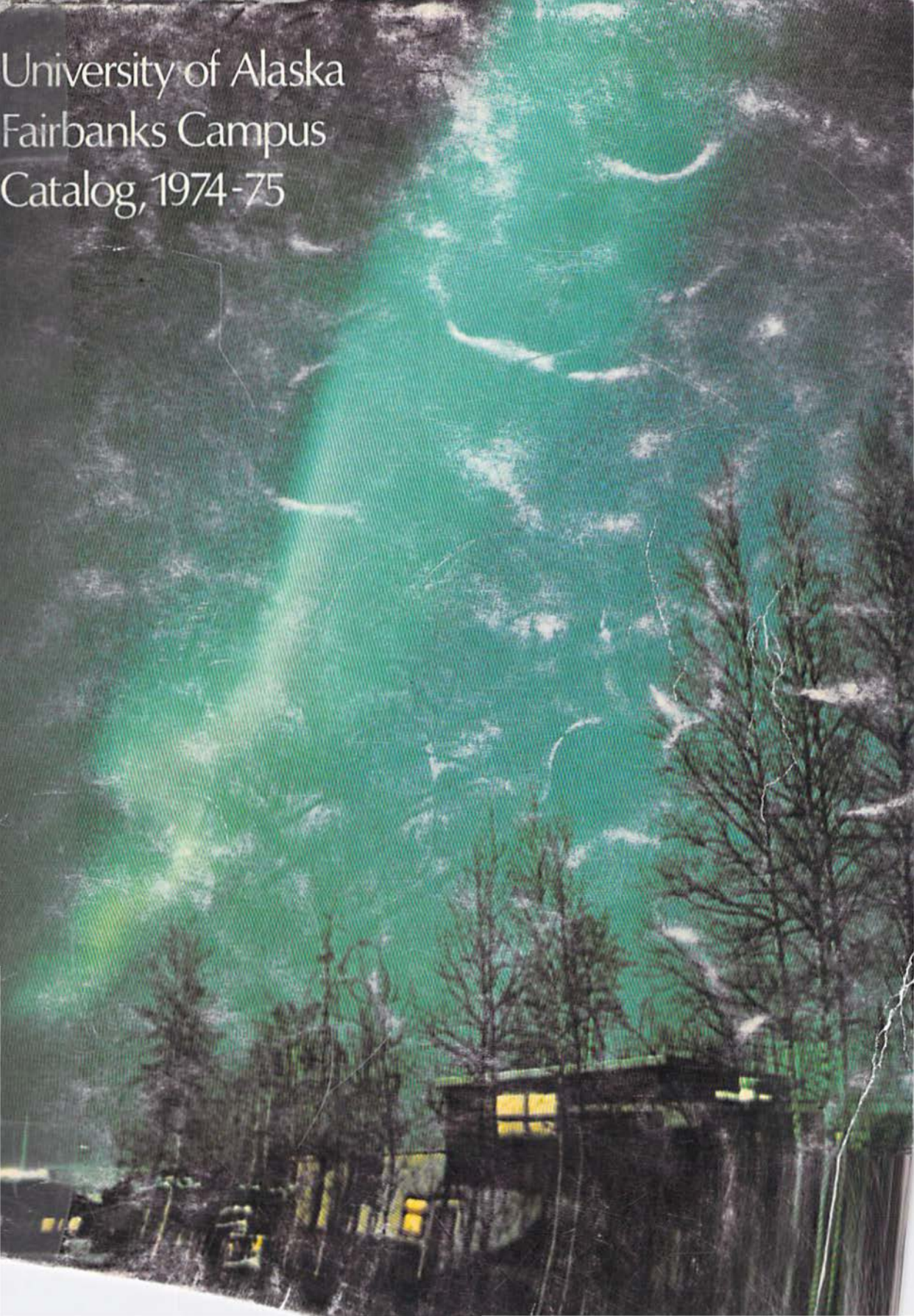
# University of Alaska Fairbanks Campus Catalog, 1974-75



Velma Hubbard

UNIVERSITY OF ALASKA

# Fairbanks Campus Catalog

## 1974-1975

**The cover:** The Northern Lights dance above the University of Alaska, Fairbanks, in this photograph by Dr. Walter J. Mueller, Dean of the College of Arts and Letters.

HOWARD HINGLEY

*The Fairbanks Campus of the University of Alaska.*

# Contents

## SOURCES OF INFORMATION
## University of Alaska

### Fairbanks Campus

| | |
|---|---|
| **Mailing Address** | University of Alaska<br>Fairbanks, Alaska 99701 |
| **General Information** | Provost |
| **Public Relations, News Service** | Director, University Relations |
| **Admissions and Residence Hall Applications** | Director of Admissions and Registrar |
| **Scholarships, Loans, Part-Time Employment** | Head, Financial Aid |
| **Extracurricular Activities** | Head, Student Activities |
| **Student Housing** | Head, Student Housing |
| **Graduate Study** | Provost |
| **Summer Sessions** | Coordinator of Summer Sessions |
| **Workshop on Alaska** | Dean of Statewide Services |
| **Evening Classes and Correspondence Study** | Dean of Statewide Services |
| **Short Courses, Conferences** | Dean of Statewide Services |
| **Alumni Association** | Head, Alumni Services and<br>Career Planning and Placement |
| **Cooperative Extension Service** | Director, Cooperative Extension Service |
| **Foreign Students** | Foreign Student Advisor |

The University of Alaska, Fairbanks, is a regional center of the University of Alaska statewide system of higher education. Under the direction of the Board of Regents, the University of Alaska serves the people of America's largest state through regional centers at Fairbanks, Anchorage, and Juneau, and community colleges at Anchorage, Bethel, Juneau, Kenai-Soldotna, Ketchikan, Kodiak, Palmer, and Sitka. The catalog for each unit in the system may be obtained from the registrar of that unit.

# 1974-75 Fairbanks Campus Calendar

## 1974 Summer Sessions

| | |
|---|---|
| Short Session | June 10 - 28 |
| Workshop on Alaska | June 24 - 28 |
| Regular Session | July 1 - Aug. 9 |
| Special Session | July 22-Aug. 9 |
| Workshop on Alaska | Aug. 12 - 16 |

## 1974 Fall Semester

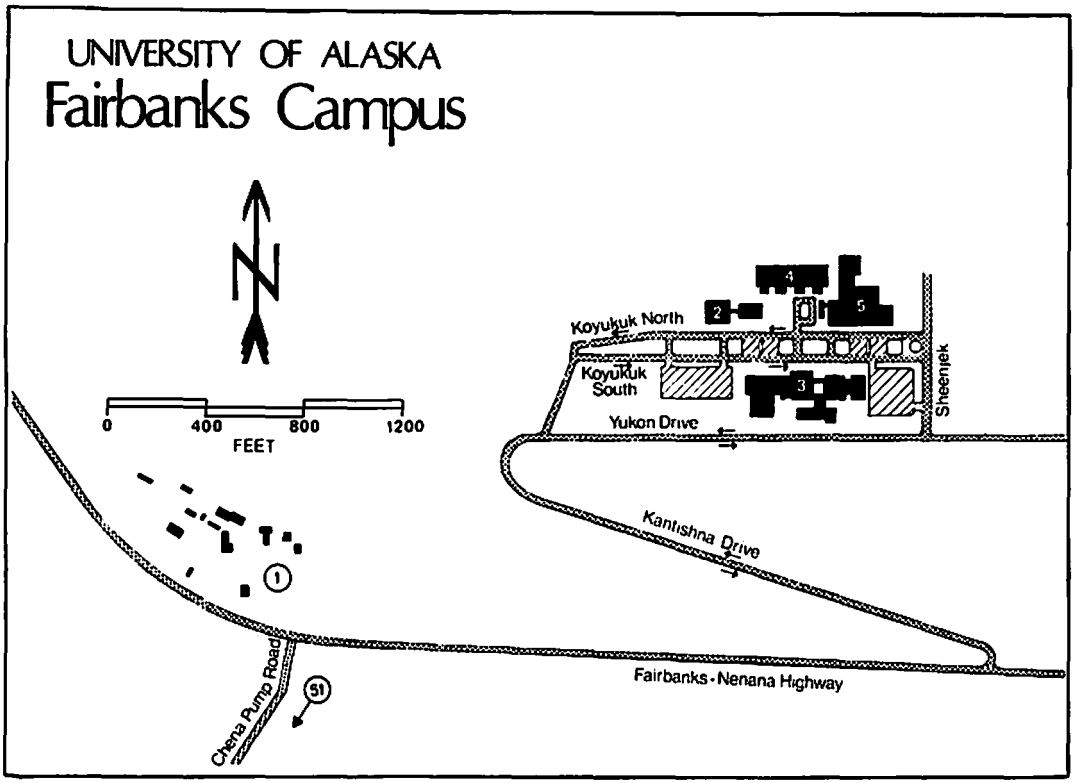
| | |
|---|---|
| Residence halls open | Sun. Sept. 1 |
| Labor Day | Mon. Sept. 2 |
| General faculty convocation | Tues. Sept. 3 |
| Faculty meetings (academic colleges) | Tues. Sept. 3 |
| Faculty meetings (departmental) | Tues. Sept. 3 |
| Orientation and guidance testing for new students | Tues. & Wed. Sept. 3 & 4 |
| Registration and counseling | Thurs. & Fri. Sept. 5 & 6 |
| Instruction begins | Mon. Sept. 9 |
| Late registration closes | Mon. Sept. 16 |
| Last day to make up incomplete grades | Mon. Oct. 21 |
| Six-week grade reports | Mon. Oct. 21 |
| Last day for student-initiated withdrawals | Wed. Nov. 20 |
| Thanksgiving holiday | Thurs. & Fri. Nov. 28 & 29 |
| End of instruction/examinations | Fri. Dec. 20 |
| Final grades on file with Registrar | Noon, Mon. Dec. 23 |
| End of fall semester | Mon. Dec. 23 |

## 1975 Spring Semester

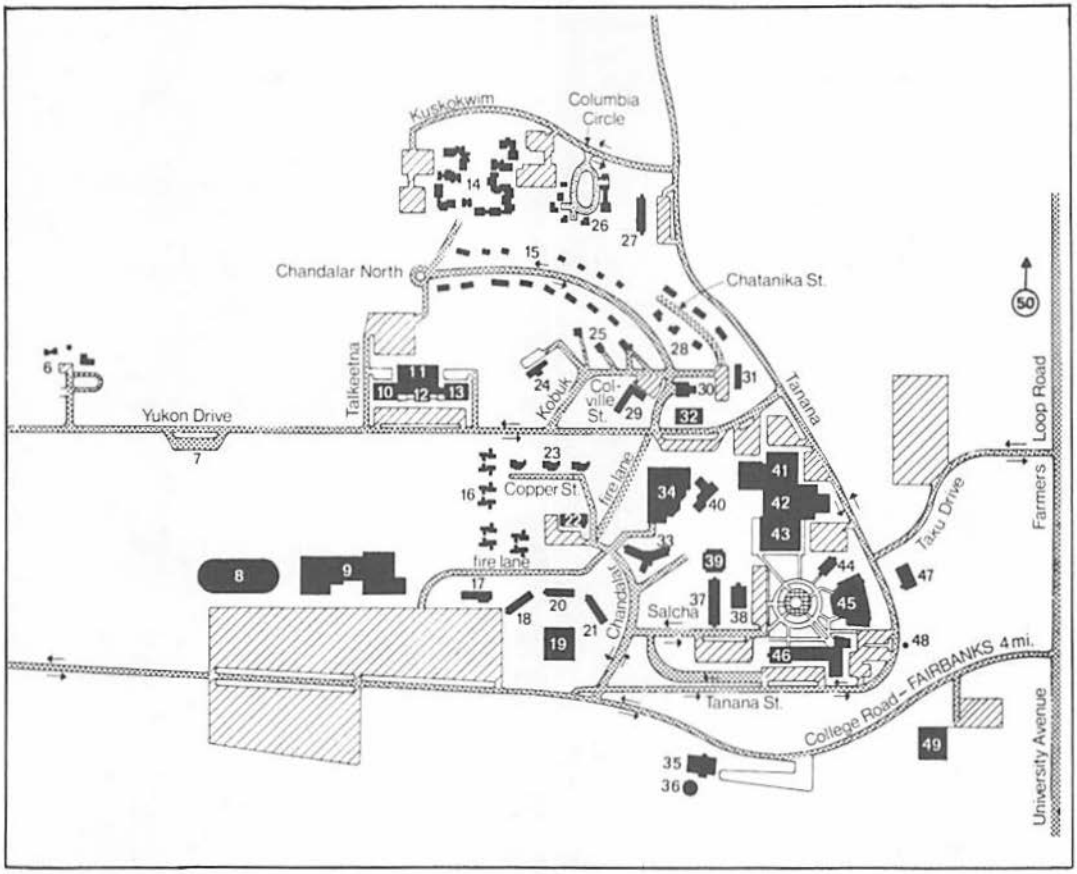
| | |
|---|---|
| Residence halls open | Sat. Jan. 11 |
| Orientation and guidance testing for new students | Mon. & Tues. Jan. 13 & 14 |
| Registration and counseling | Mon. & Tues. Jan. 13 & 14 |
| Instruction begins | Wed. Jan. 15 |
| Late registration closes | Wed. Jan 22 |
| Last day to make up incomplete grades | Tues. Feb. 25 |
| Six-week grade reports | Tues. Feb. 25 |
| Spring recess | 5 p.m. Sat. Mar. 22 thru 8 a.m. Mon. Mar. 31 |
| Final draft of thesis due to chairman, advisory committee | Fri. Apr. 11 |
| Last day for student-initiated withdrawals | Fri. Apr. 18 |
| All Campus Day (no classes) | Fri. Apr. 18 |
| Last day to submit graduate final exam form to Registrar | Fri. May 9 |
| End of instruction/examinations | Wed. May 14 |
| Final copies of thesis due to Provost or V.P. for Research | Wed. May 14 |
| Final senior grades on file with Registrar | 9 a.m. Thurs. May 15 |
| Final grades on file with Registrar | 5 p.m. Fri. May. 16 |
| End of spring semester | Fri. May 16 |
| Commencement | Sun. May 18 |

## 1975 Summer Sessions

| | |
|---|---|
| Short Session | June 9 - 27 |
| Workshop on Alaska | June 23 - 27 |
| Regular Session | June 30 - August 8 |
| Special Session | July 21 - August 8 |
| Workshop on Alaska | August 11 - 15 |




**1** Institute of Agricultural Sciences Experimental Farm.
**2** Elvey Building —Geophysical Institute.
**3** Arctic Environmental Research Laboratory.
**4** Resources Building—Institute of Agricultural Sciences, Forest Soils Laboratory, Mineral Industry Research Laboratory, U.S. Geological Survey, U.S. Bureau of Mines, Alaska Division of Geological and Geophysical Survey, Institute of Water Resources.
**5** Laurence Irving Building — Classrooms, laboratories, College of Biological Sciences and Renewable Resources, Institute of Arctic Biology, Alaska Cooperative Wildlife Research Unit.
**6** College Magnetic and Seismological Observatory.
**7** Observation point.
**8** Beluga (dome)—ice skating and hockey.
**9** Patty Building — Department of Health, Physical Education, and Recreation offices and facilities including gym, pool, and rifle range; Reserve Officers Training Corps (ROTC).
**10** Moore Hall — residence hall.
**11** Bartlett Hall — residence hall.
**12** Hess Dining Commons.
**13** Skarland Hall — residence hall.
**14** New Married Student Housing.
**15** Faculty housing.
**16** Modular units — graduate student housing.
**17** Lathrop Hall — residence hall
**18** Stevens Hall — residence hall.
**19** University Commons — dining facility for residence hall occupants.
**20** Nerland Hall — residence hall.
**21** McIntosh Hall — residence hall.
**22** Chapman Building—herbarium, classrooms, offices.
**23** Faculty housing.
**24** President's residence.
**25** Faculty housing.
**26** Faculty housing.
**27** Harwood Hall — married student apartments.
**28** Faculty housing.
**29** Stuart Hall — faculty apartments.
**30** Fire Station.
**31** Walsh Hall — married student apartments.
**32** Health, Safety, and Security Building.
**33** Wickersham Hall — residence hall.
**34** William R. Wood Campus Center—ASUA and student activities offices, games, lounge, food service, master scheduling board.
**35** Atkinson Building—Central heating and power plant.
**36** Water tank.




**37 Eielson Building** — Classrooms, laboratories, Statewide Services, Audio-Visual Communications, Cooperative Extension Service, Musk Ox Project.

**38 University Museum**—Northern Native peoples, natural history and Alaska history, research collections, and exhibits. Open to the public.

**39 Ernest Gruening Building**—General classroom and office building; College of Behavioral Sciences and Education; College of Business, Economics, and Government; Center for Northern Educational Research; Institute of Social, Economic, and Government Research; Counseling and Testing Center; Student Orientation Services; Financial Aid office.

**40 Constitution Hall**—Bookstore, Post Office, Alumni Services and Career Planning and Placement Office, Barbershop, KMPS.

**41** Fine arts complex.

**42 Regents Great Hall.**

**43 Elmer E. Rasmuson Library.**

**44 Brooks Building** — Classrooms, laboratories, College of Earth Sciences and Mineral Industry, Mineral Industry Research Laboratory.

**45 Duckering Building**—Classrooms; laboratories; College of Mathematics, Physical Sciences, and Engineering; Institute of Marine Science; Institute of Arctic Environmental Engineering; Computer Center; State Materials Laboratory.

**46 Bunnell Building** — General administrative offices, classrooms, Schaible Lecture Hall, Graphic Services.

**47** U.S. Forest Service.

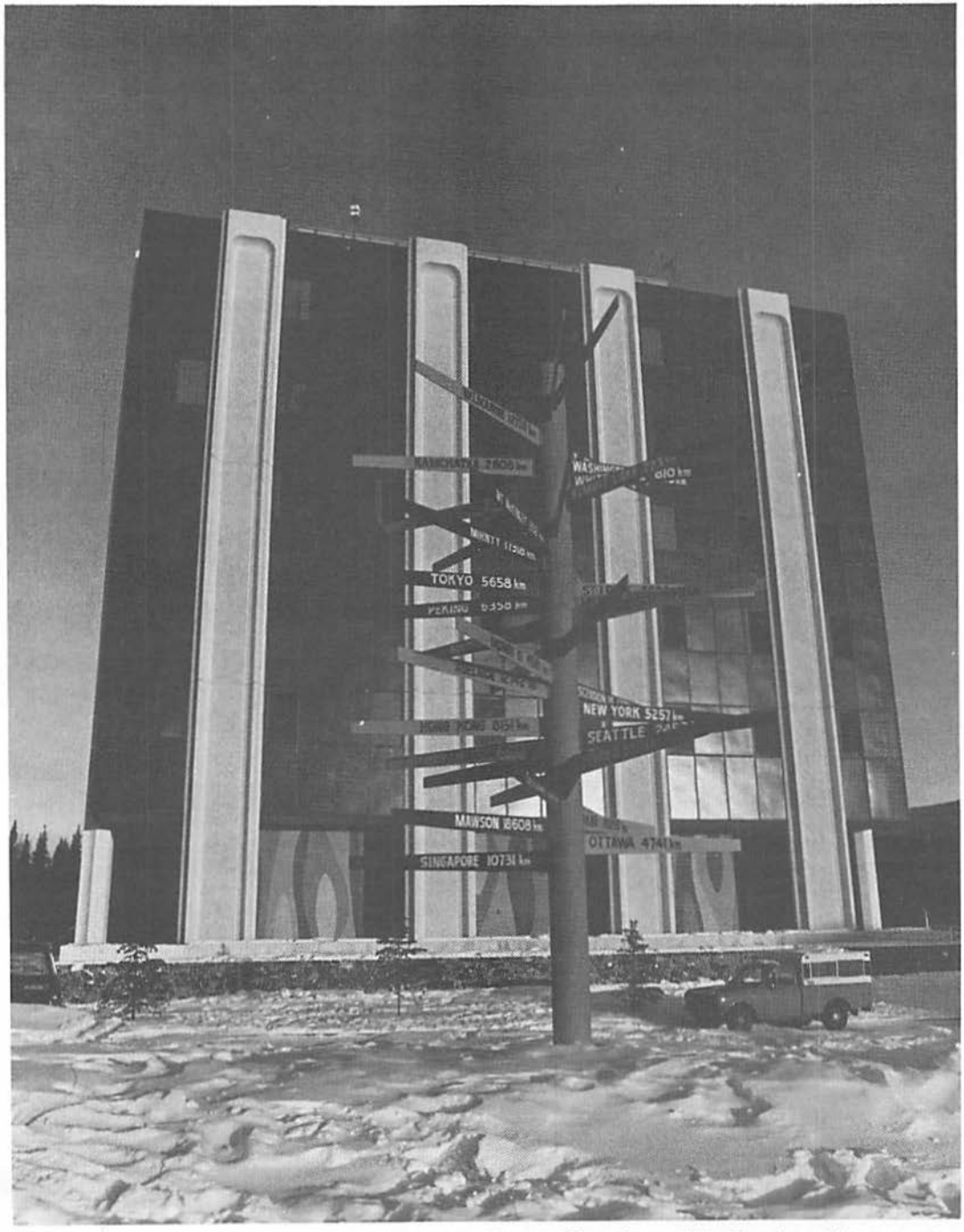
**48** Totem pole.

**49 Services Building**—Maintenance facilities, State Division of Geological and Geophysical Surveys.

**50 Musk Ox Farm** — Station for musk ox domestication project with viewing platform along Yankovich Road for visitors. Three miles from campus.

**51 Yak Estates**—faculty and staff housing, three miles from campus.

Parking lot.




*The signpost in front of the C.T. Elvey Building, home of the Geophysical Institute, gives great-circle distances to various points in the world.*

# General Information

## HISTORY

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

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

Dr. Ernest N. Patty, member of the first faculty of the Alaska Agricultural College and School of Mines and former dean of the college, was inaugurated as the third president of the University in 1953 and named President Emeritus upon his retirement in 1960. Dr. William R. Wood became the University's fourth president at that time. Dr. Robert W. Hiatt became the University's fifth president in 1973 upon the retirement of Dr. Wood.

Today, the University's statewide system includes regional centers, with senior colleges, at Fairbanks, Anchorage, and Juneau, and community colleges at Anchorage, Bethel, Juneau, Kenai-Soldotna, Ketchikan, Kodiak, Palmer, and Sitka.

## ACCREDITATION

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

The four-year curricula in mining engineering, geological engineering, civil engineering, and electrical engineering are accredited by the Engineers' Council for Professional Development. The council represents the principal engineering societies and examining boards of the United States and Canada.

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

## TRANSPORTATION TO THE UNIVERSITY

The city of Fairbanks is served by air, rail, and highway. Major airlines providing flights to Fairbanks are Alaska, Pan American, and Wien. The Alaska Railroad provides passenger and freight service between Fairbanks and Anchorage and other points south. The city may be reached by bus or private automobile from Anchorage and southcentral Alaska, and it is the northern terminus of the Alaska Highway, which provides a direct overland link with the 48 contiguous states.

Fairbanks may also be reached by a sea-land route. Vessels of the State Marine Highway System carry passengers and automobiles from Seattle, Wash., and Vancouver and Prince Rupert, B.C., to Haines, at the north of Alaska's "panhandle," which is linked to Fairbanks by highway.

The University of Alaska's Fairbanks Campus is some four miles west-northwest of the Fairbanks central business district. A private bus line offers service between the campus and downtown.

## ENROLLMENT HISTORY AND SUMMARY

### Fall Enrollment—Fairbanks Campus

| | | | | | |
|---|---|---|---|---|---|
| 1922 | 15 | 1942 | 157 | 1962 | 1,159 |
| 1927 | 83 | 1947 | 323 | 1967 | 1,773 |
| 1932 | 121 | 1952 | 296 | 1972 | 3,158 |
| 1937 | 220 | 1957 | 590 | | |

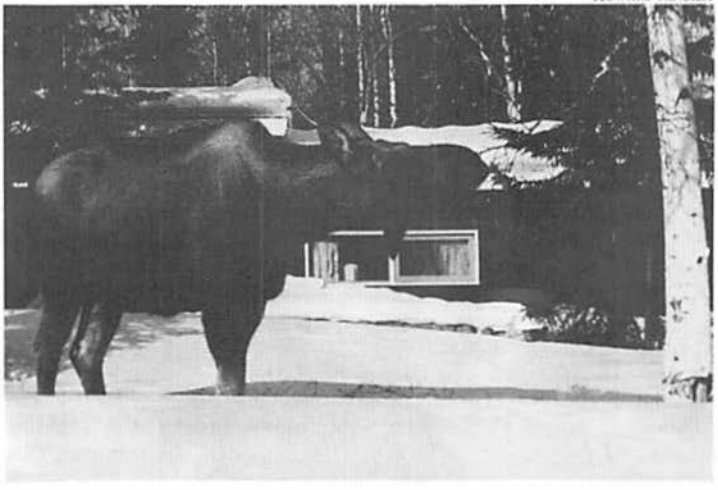
### Enrollment Summary, 1973-74 First Semester

| | *Men* | *Women* | *Total* |
|---|---|---|---|
| Freshmen | 400 | 310 | 710 |
| Sophomores | 210 | 159 | 369 |
| Juniors | 229 | 140 | 369 |
| Seniors | 181 | 96 | 277 |
| Graduate Students | 198 | 74 | 272 |
| Without Class Standing | 322 | 398 | 720 |
| Transfers | 132 | 79 | 211 |
| Totals | 1,672 | 1,256 | 2,928 |

### Enrollment Distribution, 1973-74 First Semester

| *Student's Permanent Residence* | *Men* | *Women* | *Total* |
|---|---|---|---|
| Alaska | 1,226 | 1,090 | 2,316 |
| Other States and U.S. Territories and Possessions | 404 | 151 | 555 |
| Foreign Countries | 42 | 15 | 57 |
| Totals | 1,672 | 1,256 | 2,928 |

Howard Ringley



*A young moose pauses for a snack in the President's front yard.*

# Admissions

## APPLYING FOR ADMISSION

### When to Apply

It is recommended that seniors in high school make application for admission during the first semester of their senior year, if they plan to enroll at the University during the next fall semester. Transfer and graduate students should make application at least four months prior to the beginning of the semester in which they plan to enroll at the University of Alaska. Applications for admission will be accepted until August 1 for the fall semester and December 1 for the spring semester. Applications received after these closing dates may be considered for the following semester.

### How to Apply — Read Carefully

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

1. **Application for Admission** — A $10 application fee must accompany the completed Application for Admission form.

2. **Scholastic Records**—An applicant is required to have complete official transcripts of all high school and college credits sent to the University of Alaska in support of his application. (For exception, *see* 4, below.) An official high school transcript or a secondary school record form completed by the high school where the applicant finished his high school work should be mailed to the University from the high school. A high school transcript is not required of a graduate applicant or a transfer applicant who has completed more than one full year of college work elsewhere. An official transcript from each college or university attended must be sent to the Director of Admissions and Registrar. The applicant is responsible for requesting that these transcripts be sent to the University of Alaska but transcripts will not be accepted unless they are sent to the Director of Admissions and Registrar directly from the other college or university attended.

3. **ACT Test** — Results from the tests prepared by the American College Testing Program (ACT) are required for all entering freshmen and those transfer students with fewer than 30 semester hours of transferable credit. Test results must be on file with the Office of the Director of Admissions and Registrar before final acceptance and approval for registration is granted. It is the responsibility of the student to have the test results sent to this office.

4. **ACT Processing for Freshmen**—A high school senior applying for admission to the Fairbanks Campus of the University of Alaska as a freshman may not be required to file a seventh-semester high school transcript in order to be granted conditional acceptance, provided that the official report of the applicant's American College Test results indicates that he meets University entrance requirements. Final acceptance will be granted when an official transcript indicating satisfactory completion of high school graduation requirements is received by the Director of Admissions and Registrar.

5. **Letters of Recommendation** (graduate applicants only)—At least three letters of recommendation are required from people capable of describing the applicant's character and his ability to undertake graduate study and research. The letters should be forwarded to the Director of Admissions and Registrar.

### After Acceptance

After the required credentials are received and processed, a statement of acceptance will be mailed to the applicant. After the acceptance statement is received, the following items, where applicable, should be completed by the applicant and mailed to the proper offices within the time limits suggested.

1. **College Catalogs** (transfer students only)—A transfer student is responsible for having catalogs of colleges previously attended sent to the Director of Admissions and Registrar at least two months prior to the expected date of enrollment.

2. **Medical and Physical Examination**—Registration at the University is dependent upon

the applicant having completed a recent physical examination which will confirm that his health is sufficient to enable him to undertake successfully the course of study for which he is applying. This requirement applies to all new students enrolling for seven credits or more, to students enrolling for seven or more hours for the first time, and to former students returning to the University after an absence of two or more semesters and enrolling for seven or more credits. The physical examination is to be completed by the physician of the applicant's choice and recorded on the University physical examination form within six months of the registration date. Results of a tuberculin test within the year (also of chest X-ray within the year if the test is positive) must be included. These all must be completed and on file at the Student Health Center before registration may be completed. A physical examination form will be sent with the statement of acceptance. This information will be used only as a background for providing thoughtful health care. It will not jeopardize school status. All medical records are kept confidential on file at the Student Health Center. Although a new physical examination is not required each year, it is a yearly requirement for all students enrolling for seven or more credit hours to have a completed tuberculin skin test (a minimum of 48 hours is required before the test is read) or a chest X-ray. A chest X-ray must be taken if the tuberculin test is positive. A student will not be permitted to register unless this requirement is met and the results of the test recorded at the Health Center.

## ADMISSION REQUIREMENTS FOR FRESHMEN

### High School Graduates —Baccalaureate Programs

1. **Residents**—An Alaska high school graduate with an academic average of C or higher is eligible for admission. An Alaskan whose high school grades averaged less than C will be considered for admission to the University in a baccalaureate degree program only if his performance on the ACT test demonstrates that he has the capacity to undertake college academic work successfully. The ACT test is administered at testing centers throughout the country in October, December, February, April, and July of each year. Most Alaska high schools serve as ACT testing centers in December and/or February. Arrangements for taking the ACT test may be made through high school principals or guidance officers.

2. **Nonresidents**—A nonresident high school graduate with an academic average of B or higher is eligible for admission. A nonresident whose high school grades average less than B will be considered for admission to the University only if his performance on the ACT test demonstrates exceptional ability and if there is space available in his desired major field of study. Information concerning ACT testing centers and dates may be obtained from most high schools and from the American College Testing Program, Post Office Box 168, Iowa City, Iowa 52240.

### Non-High School Graduates —Baccalaureate Programs

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

### High School Graduates—Associate Programs

Any Alaskan high school graduate is eligible for admission to an associate degree program. An Alaskan applicant with less than a C average may be directed to a community college near his home for his initial enrollment with the University.

## ADMISSION REQUIREMENTS FOR TRANSFER STUDENTS

An applicant who has attended another accredited institution is eligible for admission if space is available, provided he has a 2.00 grade point average and honorable dismissal. The University will transfer credits from other accredited institutions when the grades of courses completed are C or above. Transfer credits are evaluated by the registrar after a student is admitted to the University. The University reserves the right to reject work of doubtful quality or to require an examination before credit is allowed.

A transfer student with fewer than 30 acceptable credits is required to take the test

## Specific Entrance Requirements

The specific high-school-credit entrance requirements of the six colleges of the University are given in this table:

| College | English | Mathematics | *Foreign Language | U.S. History | Natural or Social Science | Academic and Elective |
|---|---|---|---|---|---|---|
| College of Arts and Letters | 3 | Algebra - 1<br>Geom. - 1 | 2 | 1 | 2 | 5 |
| College of Behavioral Sciences and Education: | | | | | | |
| Anthropology, Psychology, and Sociology | 3 | 2 | 2 | 1 | 4 | 5 |
| Education and Home Economics | 3 | **2 | 0 | 1 | 2 | 7 |
| College of Biological Sciences and Renewable Resources | 3 | †Algebra - 2<br>Geom. - 1<br>Trig. - ½ | † | 1 | Physics or Chemistry-1<br>Biology or Elective - 1 | 7 |
| College of Business, Economics, and Government: | | | | | | |
| Business | 3 | 2 | † | 1 | 2 | 7 |
| Economics, and Political Science | 3 | 2 | 2 | 1 | 2 | 5 |
| College of Earth Sciences and Mineral Industry: | | | | | | |
| Geology, Geological Engineering, Mining Engineering | 3 | Algebra - 2<br>Geom. - 1<br>Trig. - ½ | 0 | 1 | Physics or Chemistry - 1 | 7½ |
| Geography | 3 | 2 | 0 | 1 | 4 | 5 |
| College of Mathematics, Physical Sciences, and Engineering | 3 | Algebra - 2<br>Geom. - 1<br>Trig. - ½ | 0 | 1 | Physics or Chemistry - 1 | 7½ |

*Students who offer two units of a high school foreign language will normally enroll in a second year language. *See* Orientation and Placement Testing, page 35.

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

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

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

prepared by the American College Testing Program. Information concerning ACT testing centers and dates may be obtained from most high schools throughout the nation and from the American College Testing Program, Post Office Box 168, Iowa City, Iowa 52240.

A member of the Armed Forces who has taken USAFI Courses may, upon application for admission and presentation of credentials to the Office of the Director of Admissions and Registrar, receive credits as recommended in the Evaluation of Educational Experiences of the Armed Forces. College credit will not be allowed for the General Educational Development Tests.

## ADMISSION REQUIREMENTS FOR STUDENTS WITH BACCALAUREATE DEGREES

**Non-Degree Programs**—An applicant who holds a bachelor's degree but who has not defined his graduate program or declared the subject in which he wishes to pursue his studies toward a higher degree may be admitted as a student without standing if space permits. Students in this category include:

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

**Admission as a Graduate Student**—In general, a student may be admitted to graduate status if he has a bachelor's degree from an accredited institution with at least a B average in his major and if his major is deemed suitable for continuation of studies in the field of his choice.

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

As soon as the student is accepted, an advisory committee of not fewer than three faculty members will be set up to assist the student in planning and carrying out his program. (*See* Degree Requirements—Graduate, page 29.)

## ADMISSION REQUIREMENTS FOR OTHERS

**Special Students**—A person who is at least 21 years of age may be admitted without filing transcripts of high school or college work completed. Such a student is limited to enrollment in two classes and no more than six credits per semester. A special student is subject to the academic regulations of the University, but is not considered a degree candidate until regular admission requirements are met and transcripts filed.

**Auditors**—An auditor is a student who enrolls for informational instruction only. He does not receive academic credit, does not have laboratory privileges, and may not submit papers for correction and grading. An auditor must apply for admission, register formally on the designated registration dates, obtain approval of class instructors, and pay the required fees.

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

**High School Students**—To facilitate the transition and adjustment from high school to college, the University has made special provisions for students of varied background and ability. Qualified Alaska high school seniors of advanced academic standing and ability are permitted to enroll in one or two University of Alaska courses while attending high school. To qualify for admission to college classes while still attending high school, a high school senior must have the recommendation of his high school principal, the approval of his parents, and a satisfactory grade average in his high school work. Credits earned in such college classes may not be applied to high school graduation, but will apply toward graduation from the University and may be transferred to other universities following graduation from high school, provided the grades earned are satisfactory. Seniors who are interested in participating in this program should contact their high school principals.

## CONDITIONAL AND FINAL ACCEPTANCE

A qualified applicant can be accepted for admission while currently enrolled in his last semester of high school or at another college. However, the acceptance is conditional upon receipt of ACT scores, an official transcript indicating satisfactory completion of the work in progress at the time of acceptance and, in the case of a high school senior or graduate applicant, 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 Registrar.

# Fees

## SUMMARY OF SEMESTER CHARGES

| | Resident | Nonresident |
|---|---|---|
| **Full-time Undergraduate Students** | | |
| 12 through 18 credits | $160 | $460 |
| Campus activity fee | 36 | 36 |
| Health Service fee (approx.) | 40 | 40 |
| For each credit hour above 18 credits, an additional fee of $20 per credit hour is charged. | $236 | $536 |
| **Part-time Undergraduate Students** | | |
| 11 credits | $160 | $410 |
| 10 credits | 160 | 360 |
| 9 credits | 160 | 310 |
| 8 credits | 160 | 260 |
| 7 credits | 140 | 190 |
| Campus activity fee | 20 | 20 |
| Health Service fee (approx.) | 40 | 40 |
| Recreational athletic fee ($5) | optional | optional |
| ½ through 6 credits | $20/cr. hr. | $20/cr. hr.* |
| Campus activity fee ($20) | optional | optional |
| Health Service fee (approx. $40) | optional | optional |
| Recreational athletic fee ($5) | optional | optional |
| **Full-time Graduate Students** | | |
| 12 through 15 credits | $240 | $540 |
| Campus activity fee | 36 | 36 |
| Health Service fee (approx.) | 40 | 40 |
| For each credit hour above 15 credits, an additional fee of $30 per credit hour is charged. | $316 | $616 |
| **Part-time Graduate Students** | | |
| 11 credits | $240 | $490 |
| 10 credits | 240 | 440 |
| 9 credits | 240 | 390 |
| 8 credits | 240 | 340 |
| 7 credits | 210 | 260 |
| Campus activity fee | 36 | 36 |
| Health Service fee (approx.) | 40 | 40 |
| ½ through 6 credits | $30/cr. hr. | $30/cr. hr.* |
| Campus activity fee ($20) | optional | optional |
| Health Service fee (approx. $40) | optional | optional |
| Recreational athletic fee ($5) | optional | optional |

*Students who enroll for 6 or fewer credits are considered residents for fee-assessment purposes.

*NOTE: When a combination of undergraduate and 600-level courses is taken, the appropriate full- or part-time graduate-level University fee for the total number of hours taken or a combination of undergraduate and graduate credit-hour fees, whichever is lower, will be paid.*

**Residence Hall Rents and Meal Tickets**

| | | | |
|---|---|---|---|
| Double room | $265.00 | Single room | $300.00 |
| Double room rented as a single | 335.00 | Meal ticket | 475.00 |

**Other Fees**

| | |
|---|---|
| Application fee (remit with application) | $10.00 |
| Late registration fee: | |
| First instructional day | 5.00 |
| Each succeeding instructional day | 2.00 |
| Change of registration fee (after 3rd day of instruction) | 2.00 |
| Credit-by-examination fee (each examination) | 15.00 |
| Health Service fee (approx.): | |
| Single student | 40.00 |
| Student with spouse | 62.00 |
| Student with spouse and children | 84.00 |

*NOTE: Courses which require the use of special materials, supplies, or services may have a material use fee in addition to the normal credit-hour charge.*

**All fees approved by the Board of Regents, University of Alaska.**
**The University reserves the right to change or add to its fees at any time.**
**Fee assessments are subject to audit and correction, and any such adjustments will be made within thirty days following the close of late registration. Students will be notified by mail of any adjustments.**

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

## RESIDENCY

Alaskan residents as well as students from Hawaii, the Yukon Territory, and the Northwest Territories are exempt from a nonresident tuition fee. Alaskan residents are defined as persons 18 years of age or older who have established residence in Alaska for at least one year prior to the date set for registration. The residence of those under 18 years of age is the residence of the parents or legal guardian as defined above.

## CAMPUS ACTIVITY FEE

Full-time undergraduate students carrying 12 or more semester credit hours or the equivalent, and graduate students carrying 7 or more semester credit hours or the equivalent, shall be charged a campus activity fee totaling $36 per semester. This fee is not refundable.

Undergraduate students carrying 7-11 semester credit hours or the equivalent shall be charged a campus activity fee totaling $20 per semester.

In the case of married-student couples, each individual must pay the activity fee appropriate to his or her credit-hour load.

Each will receive an identification card entitling him/her to privileges in the following programs, as noted:

**Recreation-Athletics Program**—Those paying the $36 fee are entitled to the use of the Patty Building recreational facilities, including pool, and admission to scheduled athletic events. This program is administered by the head of the Department of Health, Physical Education and Recreation. This program receives $4.50 of the $36 fee. (Part-time students and dependents of students may voluntarily purchase an activities card entitling them to the privileges of the recreational athletic program at $5 a semester.)

**Associated Students Program**—Those paying the $36 fee are entitled to participation in all student-managed social, educational, and governmental activities, including receipt of student paper, movies, student flying program, KMPS (student-run radio station), scheduled social events, student elections, and administration of student government. The $36 fee provides $16.50 for this program.

Those paying the $20 fee are entitled to participation in all Associated Students Programs with the exception of voting, holding A.S.U.A. offices, and movies (note: the full activity fee of $36 entitles the holder to free admission to A.S.U.A. movies when budgetary considerations allow.) The $20 fee provides $5 for the Associated Students Program.

**William Ransom Wood Campus Center**—All students carrying seven or more semester credit hours or the equivalent shall be charged a fee of $15 a semester to be applied toward the repayment of the construction loan for the building. This amount is included in the $36 and $20 fees.

## ROOM AND BOARD

Contracts for room and board are for one semester. An application for housing becomes a binding contract on August 1 for fall semester and on December 15 for spring semester. Contracts for fall semester are automatically renewed for spring semester on December 15 unless the Housing Office receives a notice of intent to vacate. Room rental covers all lounge, recreation room storage, laundry room, and telephone privileges. Toll calls may not be made from floor phones in residence halls.

**Room Deposit**—The completed application for housing, with a $50.00 reservation damage deposit, must be returned to the Head of Student Housing, University of Alaska, Fairbanks, Alaska 99701. If you decide not to attend the University of Alaska, and a written statement is received by the Housing Office, the policy in regard to refunds will be as follows:

*Fall Semester*—Cancellations received prior to August 1: $40.00 will be refunded. Cancellations received on or after August 1: $25.00 will be refunded if not attending the University; no refund will be made if attending the University.

*Spring Semester* — Cancellations received prior to December 15: $40.00 will be refunded. Cancellations received on or after December 15: $25.00 will be refunded if not attending the University; no refund will be made if attending the University.

**Refund of Room Deposit**—If all provisions of the contract have been complied with and no damages have been assessed, the $50.00 deposit will be refunded at the end of the school year. If moving off campus after fall semester, notice of to vacate must be given to the Housing Office on or before December 15 in order to be eligible for a full refund.

The deposit may be used to pay ourstanding 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. 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, his deposit will not be refunded, but will be transferred to the renewal application.

**Room Rent**—Room rent, along with all other fees, is due in full at the time of registration (*see* Payment of Fees). Room charges are currently $285.00 for a double, $300.00 for a single, and $335.00 for a double room- single occupancy, per semester. These fees are subject to change.

**Meal Ticket** — When registering, each residence hall occupant is required to buy a meal ticket for cafeteria meals at $475.00 per semester. Meal tickets become effective at the evening meal on registration day of each semester. Refunds are granted only with approval of the Head of Student Housing for reasons such as formal withdrawal, absence on University activities, or hospital confinement. The unused portion less a service charge equal to five day's meals will be refunded. No refunds will be given if a student withdraws during the last two weeks of the semester.

Semester meal tickets do not include vacation periods. Limited food service , on a cash basis, is available during vacation periods.

Waiver of the requirement to purchase a meal ticket is granted only under specific guidelines. If an exception is granted by the Head of Student Housing, the amount waived is less than the $475-per-semester charge. An assessment is made for costs involved in providing, operating, and maintaining the food facility, whether a meal ticket is purchased or not. The amount of this assessment is available upon request.

## STUDENT HEALTH SERVICE FEE

All Students under 26 years of age, carrying seven or more semester credit hours or equivalent, are required as a condition of enrollment to pay a Student Health Service fee to be quoted at registration. The fee covers use of the Health Center and participation in a medical plan that covers accidents and sickness.

The Student Health Program is administered by the Health Center under the direction of the Director of Student Affairs and the Head of Student Health. Hospital and medical treatment for extensive illness and injuries are provided in nearby 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.

Students 26 years of age and over, carrying seven or more semester credit hours or the equivalent, who do not wish to participate in the medical plan and who have adequate coverage under another health policy may use the Health Center by paying a fee of $12 a semester. These students must have a physical examination on file at the Student Health Center.

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

A spouse who is a student carrying seven or more semester credit hours or equivalent, and who has a physical examination on file in the Student Health Center, may use the Health Center by paying a fee of $12 per semester. Such persons must also be covered under his or her spouse's Student Health Insurance Program.

## MISCELLANEOUS FEES

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

**Late Registration Penalty** — Students registering later than the day designated for that purpose shall pay a late registration fine of $5 for the first instructional day, plus $2 for each succeeding instructional day allowed for late registration. The maximum charged is $25.

**Examination Fee** — A fee of $15 shall be charged for each examination taken for removal of an incomplete, clearance of a deficiency, or credit by examination. For more than three credits, additional charge of $1 per credit hour shall be charged.

**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.

**Graduate Placement Fee** — If credentials are not filed before graduation, a $10 charge is made for filing and one year of service. Thereafter, $5 is charged for each year the file is used.

**Graduate Extended Registration Fee** — Graduate students extending registration from previous semester must pay the graduate extended registration fee of $30 (*see* page 31 for details).

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

**Music Course Fees**—All music fees shall be waived for students enrolled for seven or more credit hours and taking a major or minor in music, as certified by the department chairman. Fees for class lessons: $15. Fees for private lessons: $45. Practice room rental: $7.50.

**Drop/Add Fee** —A charge of $2 is made for each course added or dropped after the third day of classes following the scheduled registration date. When the change in courses is faculty-initiated or due to the rescheduling or cancellation of a course by the University, no charge will be made. If the drop/add alters the status of a student from part-time to full-time or vice versa, an appropriate adjustment in registration fees will be made.

**Parking Fee**—A fee is charged for on-campus automobile parking. Parking-fee information will be available at the place of registration or from the Office of Safety and Security. Income from parking fees is used to provide parking-maintenance, electricity, and security, and for the construction of new parking lots.

**Material Use Fees**—In addition to the normal credit-hour fee, a material use fee may be charged for certain courses which require the use of special materials, supplies, or services.

## 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 tickets, student activity fees, health insurance, and deposits. In addition, any charges unpaid at the end of previous semesters are due and payable prior to reenrollment at the University.

Students who have difficulty in meeting these charges have the alternative of requesting a deferred payment plan. The Office of Financial Aids accepts such applications. Requests for the deferred payment plan should be made in writing at least one month prior to registration process and cause the late fee to be charged. Applications submitted on the date of enrollment will be processed on a time-available basis and students run the risk of delayed registration and resulting late fees as well as closed classes.

When fees are to be paid by other persons or agencies after the registration process is completed, students should coordinate the fee payment arrangements in advance with either the Financial Aid Office or the Business Office. Failure to do so may delay the registration process.

Provisions for the deferred payment plan are as follows:

1. Fifty percent or one-half of the total charges must be paid at registration time.

2. The balance is due in two equal monthly payments. There are due thirty days and sixty days following the date of registration as announced by the Registrar.

3. A processing fee of $2 for the initial contract and $2 per payment is added to the amount of the contract.

4. Delinquent payments are subject to an additional $2 charge.

## FINANCIAL OBLIGATIONS

The University 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 cancelled 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—GENERAL UNIVERSITY TUITION AND FEES

Students who are withdrawing from courses or canceling enrollment must process a withdrawal or cancellation notice at the Office of the Director of Admissions and Registrar. Refunds will be made according to the following schedule:

1. Complete refund of tuition and fees will be made when a withdrawal is made prior to the first day of instruction for semester or term or in the event courses registered for are canceled by the University.

2. Withdrawals after instruction or the term begins and prior to the 8th day of the term or semester—90 percent refund.

3. Withdrawals from the 8th day and prior to the 15th day of the term or semester—50 percent refund.

4. Withdrawal on or after the 15th day of the term or semester—no refund.

5. Claim for a refund must be made in writing to the Business Office at the time of withdrawal. The certified date of withdrawal, as indicated on the official withdrawal slip, will determine the student's eligibility for a refund. Applications for refund may be refused unless they are made during the semester or term in which they apply.

6. Students withdrawing under discipline forfeit all rights to a refund of any portion of their tuition and fees.

7. Vocational/technical course fees shall be subject to this refund schedule.

8. Health service, campus activity, laboratory, materials, and miscellaneous fees shall not be subject to refund.

CHUCK GRIFFEY

*A journalism student prepares a section of the annual magazine,* Alaska Today, *for the printer.*

# Financial Aid

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

1. **Grants (Scholarships)**
2. **Loans**
3. **Part-Time Employment**

## GRANTS (SCHOLARSHIPS)

Grants and scholarships are awarded primarily on the basis of financial need and are non-repayable.

**Basic Educational Opportunity Grants** are grants administered through the U.S. Office of Education. If fully funded by the federal government, each grant would provide assistance in the amount of $1,400 per year, less the recipient's family contribution. Application is made directly to the BEOG Program office in Iowa City, Iowa, using applications available in financial aid offices, high schools, and U.S. Post Offices.

**Supplemental Educational Opportunity Grants** are designed to provide assistance to students with acute need. Application is made directly to the Financial Aid Office at the University of Alaska.

**The Law Enforcement Education Program** provides grants for full-time law enforcement personnel enrolled at the University of Alaska. Students under this program may receive funds in the amount of fees and books. Applications for this program should be made one month prior to registration.

**Talent Grants** in limited number are awarded each year to students of extremely high capabilities and potential. Amounts awarded are $1,400 per year for Alaska residents and $1,700 for nonresidents. Contributors to the program for 1973-74 included First National Bank; University of Alaska Alumni Association; Alaska National Bank; Professional Pharmacy; Chandler Plumbing & Heating; Gene K. Kutsch, DMD; James Beckley, DVM; Arctic Swim Club Parents Association; Craig-Taylor Equipment; Blue & Gold Club; Gavora Inc.; Alaska International Air; Krize Corporation; and Meadowmoor Dairy.

Information regarding the **Bureau of Indian Affairs Grant-in-Aid** program may be obtained from the Anchorage Area Office of the Bureau of Indian Affairs. Students should apply by April 1 to know the amount of assistance available to them prior to arriving at the University.

At the present time **University Grants and Scholarships** are awarded only to Alaskan high school seniors and to currently enrolled University of Alaska students. Nonresidents must successfully complete at least two semesters of academic work at the University before they become eligible for University grants and scholarships.

Although numerous grants are awarded annually to students at the University of Alaska by various individuals and organizations, the table on the next page includes only those which were administered by the University's Financial Aid Committee during the 1973-74 school year.

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

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

## LOANS

**Emergency Loans** are available to all regularly enrolled full-time students whose financial need is modest and temporary. Although emergency loans require no cosigner, they are limited to $100 for not more than 30 days and interest is in the form of a flat service charge of $2 per loan or 50 cents if repayment is made within ten days of the date of the borrowing.

## Scholarships Administered by Financial Aid Committee (1973-74)

| Name of Scholarship | Number | Total Amount |
|---|---|---|
| AIME, Southwestern Alaska Section | One | $ 400 |
| Alaska Native Scholarships | Varies | 33,000 |
| Berry Family Scholarships | Four | 3,000 |
| Covenant High School Alumni Association "Stanton Oyoumick Memorial" | One | 50 |
| Supplementary Educational Opportunity Grants | Varies | 76,748 |
| First National Bank of Fairbanks | Two | 1,425 |
| Henderson Estate, John B. | Varies | 4,800 |
| Hess Estate, Harriet | Three | 1,600 |
| Hess Estate, Luther | Three | 2,200 |
| Knapsted Estate | Varies | 3,200 |
| Kennecott Copper Corporation | Two | 1,000 |
| Ketchikan Pulp | One | 250 |
| Lathrop Estate, Austin E. | Varies | 2,700 |
| Leach Estate, Frank M. | Two | 200 |
| Lewis Fund, Charles W. and Hortense W. | One | 500 |
| McCarthy, David Memorial Fund | Two | 800 |
| McIntosh Estate, Jessie O'Bryan | Varies | 10,400 |
| McKinnon Scholarship, Emma | Two | 700 |
| Mellon Foundation | Varies | 8,100 |
| National Bank of Alaska | Varies | 2,700 |
| National Electrical Contractors Association | One | 750 |
| Northern Commercial Company | Two | 1,000 |
| Pioneers of Alaska Igloo No. 4 | One | 500 |
| Presser Foundation | One | 400 |
| Ralston Purina Company | One | 500 |
| Reading & Bates Scholarship | Varies | 500 |
| Sheppard Trading Company | One | 800 |
| Standard Oil of California | Four | 4,000 |
| State Room Scholarships | Varies | 37,000 |
| Unalakleet PTA "Sen. William E. Beltz Memorial" | One | 300 |
| U.S. Smelting, Refining and Mining Company | One | 400 |
| Union Oil Company — Geology | One | 500 |
| Union Oil Company — Civil Engineering | One | 500 |
| University of Alaska Alumni Association | One | 300 |

**University Loans** are available to currently enrolled students who have successfully completed one previous semester as full-time students. Loans are limited to $500 and are payable prior to the forthcoming September 1. The interest rate on the money borrowed is four percent per annum. The loan requires a cosigner (not a fellow student), and will be made only for University expenses such as room, board, fees, and books.

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

**Anchorage Women's Club (1926)**
**American Military Engineer Revolving Loan Fund**
**Lawrence C. Phipps (1930)**
**Fairbanks High School Alumni (1932)**
**First National Bank (1945)**

**Phi Tau Gamma (1953)**
**Palmer Community (1953)**
**Glenn Carrington (1953)**
**Larry Doheny (1953)**
**Pioneer Women of Alaska (1954)**
**Women's Auxiliary No. 4, Pioneers of Alaska (1957)**
**Dave M. Dishaw (1958)**
**Rotary Club of Fairbanks (1963)**
**James E. Nankervis Memorial (1961)**
**Herman Turner Memorial (1961)**
**Marianne Casson Memorial Fund (1965)**
**Ketchikan Communication Committee (1966)**
**Southern California Alumni (1963)**
**Arthur A. and Anne Shonbeck Memorial (1964)**
**Anchorage Soil Conservation Subdistrict No. 4 (1966)**
**Ann Meeks Memorial Fund (1967)**
**Anchorage High School (1956)**
**Anchorage High School PTA (1959)**
**Sheils-Timson (1936)**
**Leopold F. Schmidt (1938)**
**Palmer Associated Students (1941)**
**Frank Slaven (1944)**
**Mr. & Mrs. Walter G. Culver (1959)**
**Verne E. Roberts Memorial (1960)**
**James Stanley Rodebaugh Memorial (1960)**
**Terris Moore (1971)**
**Lt. Gen. Glenn R. Birchard Memorial Fund (1967)**
**Lt. Donald R. Robinson Memorial Fund (1968)**
**Patrick Anderson Memorial Fund (1969)**

**The Clarence J. Rhode Memorial Scholarship Loan Fund** was initiated by the Territorial Sportsmen, Inc., of Juneau. Junior, Senior and graduate students in wildlife management are eligible for loans generally limited to $500 and administered on terms similar to those of the University Loan Fund. The head of the Department of Wildlife and Fisheries administers these funds.

**The Stefano Loan Fund** was established by Mr. Ralph R. Stefano, consulting engineer of Fairbanks, for the purpose of furthering instruction in mechanical engineering.

**The Society of American Military Engineers Revolving Loan Fund** enables students in engineering, science, and mathematics to borrow money to continue their education under terms similar to those of the University Loan Fund. Application is made through the Financial Aid Office.

**The Alaska Miners Association Loan Fund** is available to sophomore, junior, and senior students in the College of Earth Sciences and Mineral Industry. Under terms similar to the University Loan Fund, students may borrow up to $500 per year to a maximum of $1,000 and repay after graduation at 4 percent interest. Applications are made through the University Loan Committee with final approval by the Dean of the College of Earth Sciences and Mineral Industry.

**The Ralph P. Cernak Memorial Loan Fund** is available to junior and senior students in the College of Earth Sciences and Mineral Industry, with preference to Geology and Geological Engineering majors. Under terms similar to the University Loan Fund, students may borrow up to $200 and loans are repayable one year after graduation at 4 percent interest. Applications are made through the Office of the Dean of the College of Earth Sciences and Mineral Industry.

**The Alumni Association Loan Fund,** established in 1971, provides short-term, interest-free loans of up to $500 to full-time students.

**The Volney R. Stanard Memorial Loan Fund** was established by Sharon Stanard to assist student members of the Department of Safety and Security. The amounts and repayment conditions of the loans are determined by the Safety and Security Loan Committee with the approval of the Financial Aid Office.

**United Student Aid Funds** and **Federally Insured Student Loans** are long-term loans whereby an undergraduate or graduate student can borrow, through his home-town bank, a maximum of $2,500 a year for educational expenses. The loans are repaid at 7 percent interest (minimum payment is $30 monthly), with payments beginning nine months after separation from the institution.

Any full-time student who is a two-year resident of the state of Alaska and has a high school diploma or the equivalent, is eligible to apply for an **Alaska State Scholarship Loan.** Undergraduate students may borrow up to $2,500 a year to pay for educational expenses at any accredited institution in the world. Graduate students may borrow up to $5,000 a year. If a student completes his degree program and is employed in the state, he will be eligible for up to 40 percent cancellation of the loan.

Eligibility for **National Direct Student Loans** is based on need as well as academic standing, and application is made through the Financial

Aid Office. Up to $5,000 can be borrowed for undergraduate work and up to $10,000 for combined undergraduate and graduate work. Repayment of the loan begins nine (9) months after separation from school with a $30-a-month minimum payment at 3 percent interest. There is also the possibility for deferment and cancellation of payments.

## PART-TIME EMPLOYMENT

**On-Campus and Off-Campus Jobs.** Listings are available in the Financial Aid Office for both on-campus and off-campus jobs. Students interested may inquire at the office for information but must apply for the positions themselves.

**Work-Study.** A financial aid application and financial statement (see section on Student Financial Need) are required in order for a student to be considered for the College Work-Study Program. Under this program students may work part-time during the school term and 40 hours per week during vacation periods. Most of the work opportunities are on-campus and can be related to a student's educational or vocational interest.

## STUDENT FINANCIAL NEED

Most student financial aid awards are based primarily on need. A student's need is determined from information supplied on the Parents' Confidential Statement (PCS) or, in the case of students who are independent from parents (see below), from information supplied on the Student's Financial Statement (SFS). Students seeking financial assistance are required to submit a copy of either the PCS or the SFS to the College Scholarship Service, designating the University of Alaska as one of the recipients, by February 1 for the following fall semester or October 1 for the following spring semester. The PCS and SFS forms may be obtained from the University, secondary schools, or the College Scholarship Service, P.O. Box 1501, Berkeley, California 94701.

## FINANCIAL INDEPENDENCE FROM PARENTS

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

For the calendar year prior to the academic year for which he is applying for aid, and for the year for which he is applying, a student cannot have

**1.** been claimed by his parents as a dependent on their income tax return,

**2.** received financial support in excess of $600 annually from parents, and

**3.** lived with his parents for an extended period of time (defined as any period exceeding three weeks).

Independent students are required to submit a Student's Financial Statement and an affidavit of independence in order to be considered for financial aid.

Any student who does not meet all three criteria of independence is considered to be dependent and must submit the Parents' Confidential Statement.

## PART-TIME STUDENTS

Students who are attending the University of Alaska less than half-time (i.e., enrolled for fewer than six hours per semester if undergraduate students, or for fewer than five hours per semester if graduate students) are not eligible for financial aid.

Half-time students (undergraduates enrolled for six to eleven hours and graduates enrolled for five to eight hours) are eligible to apply for certain types of financial aid: Basic Educational Opportunity Grants, Supplemental Educational Opportunity Grants, College Work-Study, National Direct Student Loans, United Student Aid Fund Loans, Federally Insured Student Loans, and Law Enforcement Education Program grants.

Full-time students (undergraduates enrolled for at least twelve hours and graduates enrolled for at least nine hours) may apply for any type of assistance for which they meet all other eligibility requirements.

## APPLICATION PROCEDURES

Financial aid applications are available from the University or from Alaska high schools. Applications from currently enrolled students are accepted twice each year: before March 1 and before November 1. Applications from high school seniors are accepted once each year (before March 1) and are reviewed only after the

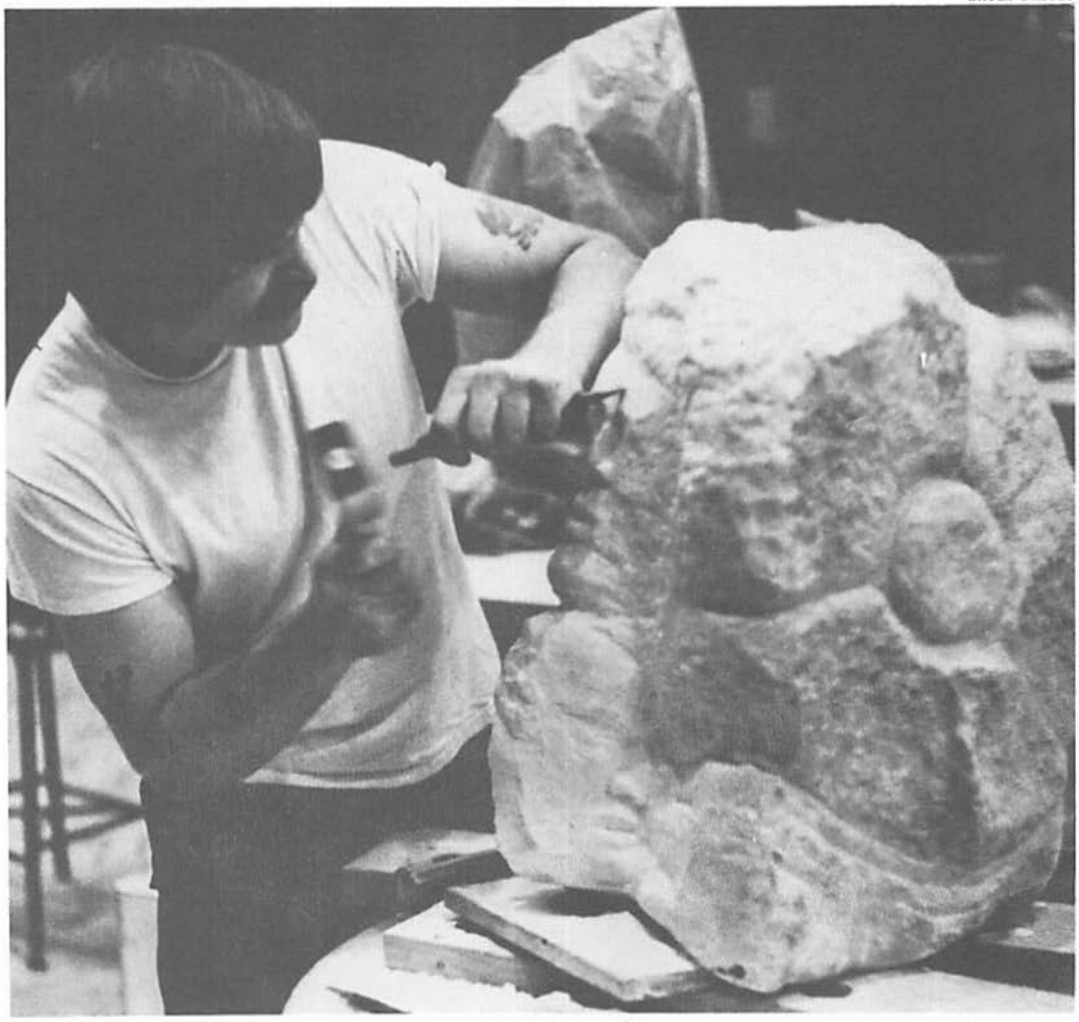
applicant's admission to the University has been approved. Students who apply after the deadlines will be considered for aid if there are funds available.

In addition to an application for financial aid a student must file either a Parents' Confidential Statement or a Student's Financial Statement (see section on Financial Independence from Parents). These must be filed a month before the March 1 and November 1 application deadlines to provide time for processing.

One general application may be submitted to apply for any of the following programs: Grants, Scholarships, University Loans, National Direct Student Loans, and Work-Study. Separate applications are required for Bureau of Indian Affairs Grants, Emergency Loans, United Student Aid Fund Loans, Federally Insured Student Loans, Alaska State Scholarship Loans, Law Enforcement Education Program, and Talent Grants.

Questions concerning application forms, specific programs, or selection procedures should be directed to the Financial Aid Office.

CHUCK GRIFFEY



*For art students, stone is one of many media of expression.*

HOWARD RINGLEY

*The 49-foot-high totem pole, a campus landmark, receives a fresh coat of paint.*

# Degrees

## DEGREES OFFERED

The University of Alaska, Fairbanks, offers programs leading to the following:

**Undergraduate Degrees**

Associate in Applied Science, A.A.S.
Associate in Arts, A.A.
Associate in Chemical Science, A.C.S.
Associate in Computer Information Systems, A.C.I.S.
Associate in Electronics Technology, A.E.T.
Associate in Mineral and Petroleum Technology, A.M.P.T.
Associate in Office Administration, A.O.A.
Bachelor of Arts, B.A.
Bachelor of Business Administration, B.B.A.
Bachelor of Education, B.Ed.
Bachelor of Music, B.Mus.
Bachelor of Science, B.S.

**Professional Degree**

Engineer of Mines, E.M.

**Graduate Degrees**

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

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

## GENERAL UNIVERSITY REQUIREMENTS

**Undergraduate**—The minimum numbers of University of Alaska credits which must be earned, including those accepted by transfer, are 60 semester hours for an associate degree and 130 semester hours for a bachelor's degree.

At least 15 of the final 30 semester hours for any associate degree must be earned at the University of Alaska. For a bachelor's degree a student must earn in residence at the University of Alaska at least 24 credits in upper-division courses and at least 30 of the last 36 credits for the degree.

A grade-point average of 2.00 (C) must be attained in all work as well as in the major and minor fields.

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

A graduate student must be registered for each semester in which he is actively working toward his degree.

In courses not primarily for graduate students, a B is the minimum passing grade. A grade of C will be acceptable in a 600-level course, provided a 3.00 (B) average is obtained in 600-level courses.

A graduate student must satisfactorily pass one or more final examinations, according to the requirements for his degree.

## DEGREE REQUIREMENTS—UNDERGRADUATE

**Associate Degrees**

The associate degree is awarded upon the successful completion of a prescribed two-year program. The degree has its own integrity and for many people it will be their most advanced formal educational experience. For others, it will

be the first undergraduate degree and a stepping stone to a baccalaureate program.

A maximum of 15 semester hours of credit completed by correspondence may be accepted toward an associate degree.

**Associate in Arts Requirements**

| | *Credits* |
|---|---|
| Written Communication | 6 |
| Oral Communication | 3 |
| Six credits from each of three of these areas: Humanities; Social Science; Natural Science; Mathematics; other (Acct., B.A., O.A., H.E., P.E., etc.) | 18 |

(No course used to meet the above requirements may be used to meet the requirements of the major.)

| | |
|---|---|
| Major Specialty | 20-30 |
| Electives to total | 60 |

*Majors Available for A.A. Degree:* Accounting, Business Administration, Early Childhood Development, Liberal Arts, Police Administration, Science.

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

**Associate in Applied Science Requirements**

| | *Credits* |
|---|---|
| Written Communication | 6 |
| Oral Communication | 3 |
| Humanities, Social Science, Natural Science, Mathematics | 6 |
| Major Specialty | 30 |
| Electives to total | 60 |

*Major Available for A.A.S. Degree:* Construction Technology. (Requirements for the major are listed in the Degree Programs section of this catalog.)

For other associate degrees offered, *see* the Degree Programs section of the catalog.

## Bachelor's Degrees

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

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

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

A student wishing to obtain a second baccalaureate degree must complete 24 hours of credit beyond the first baccalaureate degree, i.e., a minimum of 154 credits. All general university requirements, degree requirements, and requirements of the major must be met for both degrees.

**Bachelor of Arts Requirements**

| | *Credits* |
|---|---|
| English 111 or equivalent, and English 211 or 213 | 6 |
| Speech Communications | 3 |
| *Major Complex | at least 23 |
| *Minor Complex | at least 12 |
| Arts and Letters/History electives including 5 or more one-semester courses totaling | at least 15 |

(Majors in history may not include history courses in satisfying this requirement. For majors in the College of Arts and Letters this requirement will be substituted by a requirement of a minimum of 5 one semester courses totaling a minimum of 15 credits outside the College of Arts and Letters. Repeatable courses may be counted only once in satisfying this requirement.)

| | |
|---|---|
| **Other Electives | remainder of 130 |

*Majors Available for B.A. Degree:* Anthropology, Art, Biological Sciences, Business Education, Chemistry, Earth Sciences, Economics, English, Eskimo, French, Geography, Geography and Regional Development, German, History, Humanities, Interdisciplinary Studies, Journalism, Linguistics, Mathematics, Music, Northern Studies, Office Administration, Peace Arts, Philosophy, Physical Education, Physics, Political Science, Psychology, Russian, Russian Studies, Sociology, Spanish, Speech Communications, Theatre.

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

*Minors Available for B.A. Degree:* Accounting, Alaska Native Languages, Anthropology, Art, Asian Studies, Biological Sciences, Business Administration, Chemistry, Economics, Secondary Education, Elementary Education, English, Eskimo, French, Geography, Geology, German, Home Economics, History, Humanities, Journalism, Linguistics, Mathematics, Military Science, Music, Office Administration, Philosophy, Physics, Physical Education, Political Science, Psychology, Russian,

Russian Studies, Sociology, Spanish, Speech, Speech Communications, Theatre.

*A double major, which must be approved by academic petition, may be completed instead of a major amd a minor. The student must complete 130 credits and satisfy all other general requirements plus all requirements for both majors.

**The curriculum for each student must include courses taken in four colleges and eight departments or programs outside of departments, exclusive of the nine-credit communications requirement. Courses cross-listed in a major department and other departments will be considered as being in the major department in determining distribution requirements. In those parts of University of Alaska statewide system where no breakdown by colleges and/or department exists, distribution will be achieved by treating disciplines as they are represented in specific colleges, departments and/or programs on the Fairbanks Campus.

**Bachelor of Science Requirements**

| | *Credits* |
|---|---|
| English 111 or equivalent and English 211 or 213 | 6 |
| Speech Communication | 3 |
| One semester of college-level Calculus, Math. 203, *or* Applied Statistics 301 | 3 or more |
| Chemistry, Biology or Physics (minimum of 6 credits each in two disciplines), including 2 credits of laboratory | 16 |
| Social Science (minimum of 3 credits) and Humanities (minimum of 3 credits), exclusive of 9-credit communications requirement | 15 |
| Major Complex (see departmental curricula for specific requirements and for Minor Complex, if required) | variable |
| Other Electives to bring total credits to | 130 |

*Majors Available for B.S. Degree:* Anthropology, Applied Physics, Biological Sciences, Chemistry, Civil Engineering, Economics, Electrical Engineering, Fisheries Biology, General Science, Geography, Geography and Regional Development, Geology, Geological Engineering, Home Economics, Interdisciplinary Studies, Mathematics, Mechanical Engineering, Medical Technology, Mining Engineering, Natural Resources, Physics, Physical Education, Psychology, Sociology, Wildlife Management.

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

**Bachelor of Business Administration Requirements**

| | *Credits* |
|---|---|
| Engl. 111 and Engl. 211 *or* 213 | 6 |
| Sp.C. 111—Fundamentalals of Oral Comm | 3 |
| Psy. 101—Intro. to Psychology | 3 |
| Soc. 101—Intro. to Sociology | 3 |
| CIS 101—Intro. to Data Processing & Fortran | 3 |
| History elective | 3 |
| P.S. 101 *or* 102—Intro. to American Gov't. | 3 |
| Acc. 101-102—Elementary Accounting | 6 |
| Econ.121, 122, 221 | 9 |
| Math. 161,162,110 | 11 |
| Natural Science elective | 4 |
| Major requirements and foundation courses | 51 to 53 |
| Electives to bring total credits to | 130 |

*Majors Available for B.B.A. Degree:* Accounting, Finance, Management, Marketing.

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

**Bachelor of Education Requirements**

*See* under Education in Degree Programs section.

**Bachelor of Music Requirements**

*See* under Music in Degree Programs section.

## DEGREE REQUIREMENTS—GRADUATE

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

Graduate programs of the Northern Region are supervised by the Provost. His office formulates policies to guide and govern graduate studies.

The Vice President for Research supervises the programs of graduate students who are affiliated primarily with the statewide research institutes of the University; these programs include those in Geophysics, Oceanography and Ocean Engineering, Arctic Biology (Zoophysiology), and certain other interdisciplinary topics involving research, instruction, and supervision in the institutes. The WAMI experimental program in medicine also is administered by the office of the Vice President for Research.

Applicants who have doubt about the position of their programs should consult the Provost.

### Master's Degrees

As will be seen under departmental listings, programs leading to master's degrees are offered in the areas of anthropology, biology, botany, business administration, chemistry, civil engineering, environmental quality engineering, education, electrical engineering, engineering management, English, fisheries biology, geology, geophysics, history, mathematics, mechanical engineering, mining engineering, mineral preparation engineering, physics, science management, wildlife management, and zoology. Students wishing to enroll for graduate study in any of these fields should obtain an application form from the Office of the Director of Admissions and Registrar and follow the application procedures for graduate students (*see* Admission as a Graduate Student, page 14).

In addition, programs leading to master's degrees may be arranged on request in certain aspects of other areas; for example, arctic engineering, economics, land resources, linguistics, regional development, etc. Students interested in pursuing studies in one of these or any other discipline not listed should write directly to the Provost.

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

The requirement for a master's degree is a minimum of 30 semester credits, of which a maximum of 12 may be devoted to the thesis. At least nine semester credits, in addition to those earned for the thesis, must be at the 600 level. No lower division courses (100 or 200) are applicable. A maximum of nine semester credits from another institution may be transferred to the University of Alaska and applied toward a degree if approved by the student's advisory committee and by the dean of the college in which the student is enrolled.

A student will be permitted to continue graduate study from semester to semester only if his performance is satisfactory as judged by the student's advisory committee and the Dean, but, minimally, a cumulative grade-point average of 3.00 in courses of the approved program (all courses if the program has not yet been delineated) is required for good standing. In the course work aspects of the program, B is a minimum passing grade 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 in graduate courses.

A student may be admitted to candidacy for a specific master's degree after he has satisfied all the following requirements: 1) completed at least eight credits of graduate study at the University of Alaska; 2) demonstrated a reading ability of a foreign language, if required; 3) received approval of the provisional title of his thesis if a thesis is required, and of his program of studies.

The candidate must pass a final examination, either written or oral; if a thesis is required, the examination will include a defense of the thesis. The examining committee shall consist of a candidate's advisory committee and an examiner from outside the candidate's college, representing the Office of the Provost.

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

### Educational Specialist Degree

The minimum number of credits which must be earned beyond the bachelor's degree is 60 semester hours, 18 of which must be 600 level.

A maximum of 36 hours of credit may be accepted by transfer, with approval of the student's graduate committee and the Dean of the College of Behavioral Sciences and Education.

All work toward the fulfillment of the requirements for the Educational Specialist degree must be completed within 7 years.

### Doctor of Philosophy Degree

No restrictions are placed on the disciplines that may be studied by students seeking doctoral degree. There are well established programs in certain areas of physics, geophysics and geology, while students are commonly accepted in oceanography, zoophysiology, zoology and wildlife management.

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

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

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

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

Specification language and/or analogous research tool requirements will be made by the candidate's graduate committee after full discussion with the candidate. Research tool requirements may include such courses as computer languages, mathematics, law, etc. at the discretion of the committee.

When languages are required, selection and administration of suitable proficiency tests will be under the direction of the graduate committee.

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

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

After submitting the dissertation, the candidate must pass an oral examination supporting his dissertation. The examining committee will consist of a minimum of five members: the candidate's advisory committee supplemented by additional examiners.

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

## THESES AND DISSERTATIONS

Two copies of the thesis or dissertation, typed and bound (original and best reproduction), must be filed in the University library. Departments may require additional copies. All records of work done in connection with the preparation of theses 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 head of the department and the Provost after it has been reproduced by the University.

## EXTENDED REGISTRATION FOR GRADUATE STUDENTS

A student must be registered each semester in which he is actively working for his degree. A student whose remaining requirement is the completion of his final examination(s) or the removal of a deferred grade from an earlier enrollment may extend his registration. Extended Registration, including payment of the fee, must be completed during the regular registration period at the beginning of the semester. Extended Registration Forms are available in the Office of the Director of Admissions and Registrar during the regular registration period for each semester. Staff members may register for students who are not on campus. Upon completion of Extended Registration, the student is considered enrolled for the current semester.

HOWARD RINGLEY

*Practicing a rescue procedure, members of the student-manned fire department raise a litter to the roof of the Elmer E. Rasmuson Library.*

# Academic Regulations

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

**Advanced Placement** — The University of Alaska will grant advanced credit, with waiver of fees, on satisfactory performance in College Board Advanced Placement Tests or other national examinations declared acceptable by individual departments. Advanced placement may also be available, with waiver of fees, in some departments through departmental placement tests given at the time of the student's enrollment.

Such credit is available to enrolled students only after the students have completed one or more semesters at the University.

In the case of the College Board Advanced Placement Tests, a grade of 3 or higher is acceptable for placement. The level of performance required on other departmentally approved tests is determined by the specific department involved.

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

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

| | |
|---|---|
| **Freshman** | **0-29 credits** |
| **Sophomore** | **30-59 credits** |
| **Junior** | **60-94 credits** |
| **Senior** | **95 credits** |

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

**Study Load**—Students normally may register for 18 semester hours of credit; for 19-20 semester hours with the approval of the dean of the college; for 21 or more semester hours provided the student's grade point average with a full time study load for the past two semesters is at least 2.75 and he has the approval of the Provost.

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

An undergraduate full-time student is one who enrolls for 12 or more semester hours of credit. Any undergraduate student who qualifies for entrance and registers for fewer than 12 credits will be classified as "part-time" regardless of his previous standing. A graduate student enrolled in 9 or more semester hours of credit or its equivalent will be classified as full-time.

Any regular student who does not follow a prescribed course of study or curriculum leading to a specific degree will be enrolled as "undeclared" major. A student with an interest in a specific college, but who has not selected a major from that college, will be enrolled as a "nonmajor" in the college.

Special students are considered "undeclared" and are not assigned class standing.

**Credit-by-Examination** — Application for credit-by-examination originates in the Counseling and Testing Center. Most of the examinations covering specific courses at the University of Alaska are provided by the appropriate department. However, a few nationally prepared exams have been accepted for use from the College Level Examination Program (CLEP). In addition to subject examinations, general examinations are available through CLEP and cover broader academic areas.

To be eligible to request a locally prepared credit-by-examination, one must be an enrolled student at the University of Alaska, Fairbanks. One test date is designated each semester and the request must be initiated a minimum of 40 days before the date of the examination. A course in which a student has previously registered as an auditor may not be completed for credit-by-examination. The examination for a specific course is graded P (pass), F (fail), or regular letter at the discretion of the department providing the examination and is recorded as such on the permanent record.

Persons not enrolled at the University are eligible to take the CLEP examinations. These national exams are administered on a specified date each month. A transcript service is available from the Educational Testing Service.

Accepted degree applicants presenting a transcript with acceptable scores on the approved CLEP examinations from the Educational Testing Service will be granted credit for the appropriate course. The University of Alaska grants six semester hours of credit for each area examination of the general examinations offered through the College Level Examination Program and credit for subject examinations varies. The CLEP general and subject examinations are graded on a credit-no-credit basis and only the examinations passed with an acceptable score are recorded on the permanent record. The general and approved subject examinations are acceptable to challenge general requirements or specific courses, respectively, as directed by the academic departments concerned. A list of the approved CLEP subject examinations may be obtained at the Office of the Director of Admissions and Registrar or at the Counseling Center.

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

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

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

**C**—Indicates a satisfactory and average response to assignments.

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

**F** — Indicates failure.

**CR—Credit.** The Credit-No-Credit option encourages students to explore areas of interest not necessarily related to their academic major. One "free" elective may be taken under this option each semester. The instructor will not be informed of the student's status in the course. The student will be given credit toward graduation if he performs at a level of C or above. If performance falls below that level, the course will not be recorded on the student's transcript. In either case, the course will not be included in any grade point calculations. If the student later changes his major and the course becomes a requirement, the course will be accepted by his new major department. The student may change from credit-no-credit to regular enrollment status or from regular to credit-no-credit status during the first two weeks of the semester by informing the Director of Admissions and Registrar of his desire to change status.

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

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

**I—Incomplete.** Given only in cases where the student must do additional work for satisfactory completion of the course and where work already completed is grade C or better; may be given for unavoidable absence or other conditions beyond the control of the student.

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

**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 requirements of the course are met within an approved time. This designation will be used with courses such as thesis, special projects, etc., that require more than one semester to complete.

**W—Withdrawn.** Given when a student makes a regular withdrawal from a class. A student may, if circumstances warrant, withdraw from a class any time up to one calendar month prior to the end of the semester. A grade of W will be given. Student-initiated withdrawals are not permitted during the last month of the semester. The grade of W carries no grade points and does not affect the grade point average. The procedure for dropping a class or withdrawing from the University is outlined on the next pages.

**Grade Points** — For the computation of grade points, each credit is multiplied by a grade factor: Grade A by 4, grade B by 3, grade C by 2, grade D by 1, and grade F by 0. A grade point average 2.00 is required for good scholastic standing.

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

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

The ACT and other placement and guidance tests must be taken before a new student with less than sophomore standing may complete his registration. On the basis of test scores, a student whose background appears to be deficient in English and mathematics may be required to take Engl. 100 or Math 105 or both in addition to the requirements of his chosen curricula. Achievement of a certain level of excellence in these subjects is essential to success in other areas of study. These basic English and mathematics courses are especially designed to assist the student in achieving these competencies.

A student continuing the study of a foreign language begun in high school will be required to take a placement test. If he fails to place at the level appropriate to the amount of his previous language study, he will be allowed to enroll for credit in a course that is one semester below his level. Work more than one semester below the normal level will be considered remedial and, although prerequisite to further study, will carry no credit.

An additional fee of $5 will be charged to students who take the placement and guidance tests at other than the scheduled times during orientation week.

Although transfer students are required to participate in the orientation program, they are not required to take the placement and guidance tests if they have at least sophomore standing. However, if it is felt that the test scores may be of value to the transfer student and his advisors, he may take the placement and guidance tests at the time they are administered to entering freshmen.

**Change of Major**—A student desiring to change his major may do so only at the beginning of a semester, and must obtain the written consent of the heads of the departments concerned on a Change of Department and/or Major form which may be obtained at the Office of the Director of Admissions and Registrar.

**Drop/Add** — A student is expected to complete the courses in which he is enrolled. He may, if circumstances warrant, withdraw without grade penalty up to one month prior to the end of the semester. Student-initiated withdrawals are not permitted during the last month of the semester. Elective and non sequence courses should be dropped first. Students wishing to add courses to their schedules may do so until the end of the late registration period. The fee for student-initiated course changes is $2 per course. A Drop/Add card must be obtained from the student's academic advisor or from the Office of the Director of Admissions and Registrar. A Faculty-Initiated Drop/Add form may be obtained from the office of the dean of the appropriate college.

**Probation and Academic Disqualification**—At the end of any semester of attendance, a student failing to earn or maintain a grade point average of 2.00 may be placed on academic probation. A student who fails to raise his scholastic average after being placed on probation may be disqualified or, under unusual circumstance, may be permitted to continue on probation but may enroll for a maximum of two college level courses in any unit of the University providing that his program is approved by the dean of his college. If a C or higher average is obtained in these two courses a student may again enroll as a full-time student. If less than a C average is obtained in these two courses, the student may be academically disqualified. A disqualified student will not be permitted to reenroll in academic programs administered on the Fairbanks campus or in upper division programs at Anchorage or Juneau for one or more semesters, and will be readmitted only upon his presentation of evidence indicating a high probability that he can do satisfactory college level work. The most obvious evidence is the completion of two or more college-level courses with a grade of C or higher at another accredited institution or another of the University of Alaska's programs — Community Colleges, Summer Sessions, Evening Division, etc.

Students who are academically disqualified from a baccalaureate degree program may, as high school graduates, enroll in academic programs offered at other units of the University of Alaska if admitted by the appropriate program dean or director.

**Total Withdrawal from the University** —A student desiring to withdraw from the university must obtain a total withdrawal form from the

Office of the Director of Admissions and Registrar.

**Academic Petition**— Any deviation from academic requirements and regulations must be approved by academic petition. A petition form, which requires the signatures of the student's advisor, department head, and dean, may be obtained from the Office of the Director of Admissions and Registrar.

**Dismissal**—A student may be dismissed for cause at any time by the President of the University, after appropriate review.

## PRIVACY OF STUDENT RECORDS

Recognizing the need to insure the privacy of individual records, the University releases information only upon permission of students to agencies off campus. Records are available for legitimate on-campus professional use on a need-to-know basis. Information on students is maintained by the following offices: Director of Admissions and Registrar for academics, Counseling for professional reference, Health Service for medical history, and Office of Student Affairs for disciplinary records and extracurricular activities. Academic and personal information is released to other institutions or employers solely upon release by the student. General information only is discussed with governmental agencies conducting standard investigations.

## ACADEMIC ADVISING

The University recognizes that academic success is promoted by close personal relationships between faculty and students. To foster this relationship it has established a system of faculty advising which enables the student to become well acquainted with the degree programs available at the University and assures involvement of faculty in assisting the student in choosing a course of study and in helping guide him toward his overall academic objectives and future goals.

The Academic Advising Program is the responsibility of the Provost and is directed by the Director of Academic Advising. Assignment of faculty advisors is made in accordance with the student's choice of college and department. Special advisement emphasis is provided for freshmen, for rural and Native students (*see* Student Orientation Services, below), and for students who have not yet chosen majors.

## STUDENT ORIENTATION SERVICES

Most importantly, Student Orientation Services offers academic advisement that is geared particularly toward Native and rural students, whose needs cover a wide spectrum. Contact with advisees is on a rather continuous basis, giving rise to more than just academic advisement.

The initial adjustment to college is a crucial period, so a serious attempt is made to keep course loads within realistic limits and course selections in keeping with the student's educational needs.

Advisement through SOS is available as an alternative rather than as an assignment and is designed to release a student to advisement in his academic area of interest after the student has become familiar with college and has decided on an educational goal.

## GRADUATION

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

**Application For Graduation**—Each student who expects to complete the requirements for a degree must file an Application for Graduation. These forms are available at the Office of the Director of Admissions and Registrar.

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

In order to graduate with honors, students transferring from other institutions must have been in attendance at the University of Alaska for at least four semesters with a minimum of 12 credits each semester. All college work attempted, including transfer credits, will be considered when determining a student's eligibility for graduation with honors.

**Graduation in Absentia**—It is a policy of the University that students who will not be present at commencement submit written requests with justification to graduate in absentia to the Director of Admissions and Registrar.

## AWARDS

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

**American Institute of Mining and Metallurgical Engineers, Alaska Section.**
**American Society of Civil Engineers, Fairbanks Sub-Section of the Alaska Section.**
**Athletic Letters and Awards**
**Marion Frances Boswell Memorial Award**
**Chemistry Department Outstanding Freshman**
**Druska Carr Schaible Memorial Award**
**Fairbanks Garden Club Conservation Award**
**Fairbanks Weavers Guild**
**George M. McLaughlin Memorial**
**Archie W. Shiels Prize**
**Sigma Xi Club, University of Alaska**
**General James Steese Prize**
**Rex Thomas Memorial Award**
**Joel Wiegert Award**

HOWARD RINGLEY

*In the warmer months, classes often move outdoors.*

HOWARD RINGLEY

*The William R. Wood Campus Center offers many facilities for recreation and relaxation.*

# Student Affairs

## GENERAL RESPONSIBILITIES

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

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

It is recommended that students release information concerning their participation and performance in university activities for inclusion in their references. Otherwise, reports are written indicating that there is no record of the students' activities at the University, which might be misleading. Students are encouraged to forward personal references for the Office of Student Affairs to keep on file.

## STUDENT BEHAVIORAL STANDARDS

Education at the University is conceived as training for citizenship as well as for personal self-improvement and develpoment. When a student enrolls he acquires a special status and prestige and assumes commensurate responsibility as a citizen in the University community. As long as he remains a student he represents the University whether on or off the campus.

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

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

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

These regulations, except for those based on state law, have been developed jointly by staff and students. Students charged with infractions are advised in writing and given a full hearing with right of counsel and the opportunity to

question witness or accusers before either elected or appointed student committees or for the more serious cases the joint Student Faculty Judicial Board. The University subscribes to principles of due process and a fair hearing as prepared by the joint statement of the American Association of University Professors, the U.S. National Student Association, the Association of American Colleges, the National Association of Women Deans and Counselors, and the National Association of Student Personnel Administrators.

## STUDENT HOUSING

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

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

Student rooms have either fixed or movable furniture. Each student has his own bed, desk, chair, mirror, and drawer and closet space; **it is his responsibility to provide all other furnishings, including bedding, pillow, and towels. Animals are not permitted in residence halls; do not bring pets.**

In addition, each hall includes a public lounge for entertaining, relaxing, and recreation. Regular custodial service is provided in common areas such as corridors, lounges, and bathrooms.

Only a limited number of headbolt heaters for automobiles are available. All motor vehicles garaged, stored, or used on campus one or more times a week must be registered and bear a University decal. Applications for decals are taken at the Safety and Security Office.

Students bringing guns into the residence halls are required to store them in a central storeroom under staff supervision. There is absolutely no exception to this policy.

All single students under 21 years of age are required to live in a University residence hall during their first and second years on campus unless; (a) they live at home or (b) they have special permission from the Head of Student Housing in accordance with University policy. Graduate students and upperclassmen are given preference over new students in the assignment of single rooms. Hall reservations are made on a first come, first served basis provided application and deposit requirements are complete. Specific room assignments will be received upon a student's arrival at the hall.

The University reserves the right to reassign individuals to different rooms, halls, apartments, and dining halls at any time in the event such reassignments are determined to be necessary.

## FOOD SERVICE

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

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

In order to provide students with meals of high quality at minimum cost, it is essential that the staff be able to plan its food purchases and preparations for relatively constant numbers. Therefore it is not possible to provide special diets or to give refunds for meals missed, except as approved by the Head of Student Housing in cases of prolonged illness, University-sponsored activities where meals are not provided, or other

unavoidable absence. Students who are exempted by a University physician from purchase of a meal ticket are required to pay that portion of the meal charge which is applied to maintenance and operation of the dining commons.

## RESIDENCE HALLS

The Student Housing Office is located in the main lounge complex which joins the Moore, Bartlett, and Skarland residence halls. This office is staffed with four full-time staff members, the Head of Student Housing, the Assistant Head of Student Housing, an administrative secretary, and a bookkeeper. During the academic year the office is open from 8:00 a.m. to 5:00 p.m. During the registration period at the beginning of each semester the office is open extended hours.

**Andrew Nerland Hall** houses 92 men in double and single rooms on its four floors. First occupied in 1953, Nerland Hall is named for a pioneer Fairbanks merchant, long-time member of the Board of Regents, and president of the Board from 1935 until his death in 1956.

**John E. McIntosh Hall,** completed in 1956, has double and single rooms for 92 men. This four-story building is named for a former president of the Board of Regents.

**Wickersham Hall,** completed in 1957, is a three-story residence for 88 women. It has single rooms and suites with four women sharing each suite, which consists of two sleeping rooms, a study, and a lavatory. This hall is named for the late 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,** completed in the fall of 1958, is a four-story coeducational unit with accomodations for 63 men and 33 women in double and single rooms. This hall is named for Morton Stevens, who was president of the Board of Regents from 1921 until 1932.

**Austin E. Lathrop Hall,** a coeducational unit completed in 1962, houses 100 men in double rooms on four floors and 34 women on the fifth floor. The building is named for a prominent Fairbanks businessman whose interests throughout Alaska were many and varied. Mr. Lathrop served as a member and later as vice president of the Board of Regents during the period from 1932 until his death in 1950.

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

**Terris Moore Hall,** a coeducational unit completed in 1966 and named for the second president of the University, is an eight-story building containing both single and double rooms. Capacity of the building is 322 students. Facilities in Moore Hall are similar to those of its companion halls—Skarland and Bartlett. These three units , with the Hess Commons, comprise a living center for men and women on the hill to the west of the president's residence, overlooking the Tanana Valley.

**E. L. Bartlett Hall,** is a high-rise, co-educational hall which houses four floors of men and three floors of women. Opened to occupancy during the fall of 1969, the eight story residence hall was constructed at a cost of $2.9 million. Bartlett Hall is the central building in the student housing complex that includes Moore Hall and Skarland Hall. The hall was named for E. L. "Bob" Bartlett, who served for 24 continuous years as the Alaskan delegate to Congress and as U.S. Senator.

## GRADUATE STUDENT HOUSING

Recognizing the special needs of older students, each year the Student Housing Office provides areas restricted to graduate students and those over 25 years of age. Unless they request otherwise, graduate and other mature students will be assigned to these areas.

## MARRIED STUDENT HOUSING

Married student housing is provided in several areas. **The Modular Units** consist of 31 efficiency units completed in the fall of 1970. The units are located on the south slope behind Lathrop and Stevens halls facing the Alaska Range. All units are furnished except for personal items such as dishes, utensils, and bedding.

**Walsh Hall,** completed in 1959, has accommodations for couples without children. This comfortable building contains 13 furnished apartments consisting of a living room-kitchen, bedroom, and bath. The building is named for the late Michael Walsh of Nome, who was a long-time member of the Board of Regents.

**Harwood Hall,** completed in the spring of 1964, was named for the late Boyd Harwood, former member of the Board of Regents. The building houses an additional 36 married student couples without children in efficiency and one-bedroom apartments. All apartments are furnished except for personal items such as dishes, utensils, and bedding.

A new married student living complex, consisting of 16 one-, two-, and three-bedroom apartments opened in the fall of 1972. All apartments are carpeted and furnished, with individual parking. Located on the north edge of the campus, the two- and three-bedroom apartments are each equipped with washer-dryer, while common laundry facilities serving four apartments each are provided for the one-bedroom units.

All married student units are rented furnished. Because storage space is extremely limited or nonexistent, extra or major personal furniture items will overcrowd an apartment. Pets are **NOT** allowed in any married student unit.

## RESIDENCE HALL APPLICATION PROCEDURES

Applications for student housing will be mailed to all students with their notification of acceptance from the Office of the Director of Admissions and Registrar. Student rooms cannot be reserved until the student is accepted by the University, through notification from the Office of the Director of Admissions and Registrar. Continuing students may receive rooms during the spring semester for the fall semester providing they have not been disqualified for scholastic or disciplinary reasons by the University. After being accepted and in order to secure student housing, the student should complete the housing-board contract and mail it immediately to: Head, Student Housing, University of Alaska, Fairbanks, Alaska 99701 with a $50 reservation and damage deposit. Confirmation for student housing is not assured until the student receives written notification from the Student Housing Office. Specific room assignments will be made after August 15. Spring semester assignments are made as space becomes available. The contract for single student housing in undergraduate residence halls is for room and board. The contract for married student housing does not include board.

The housing-board contract is in effect from the date of signing to the end of the spring semester, subject to terms indicated thereon. Students are expected to pay for the entire semester during registration; however, installment payments may be arranged through the Student Financial Aids Office.

Contracts are voided only if a student does not attend the University full time, cancels his contract prior to August 15, or is released by the Head of Student Housing because of marriage, health reasons, or other emergencies as deemed appropriate.

Room rental permits use of all lounge recreation room, storage room, laundry room, and local telephone privileges. Students may remain in the residence halls during vacation periods, but during the Christmas holidays they may be moved to one central location.

## STUDENT HEALTH CENTER

Preventive and educational, as well as protective, health services are the concern of the University and are administered by the staff at the Student Health Center located in the Health, Safety, and Security Building. Health counseling and limited medical services are available on campus from qualified health professionals who strive to maintain a "family physician" type of medical program. Services include outpatient and emergency care to the fullest extent of staff and facilities. Only those students who have paid the student health fee, have a completed medical history and physical examination record on file, and who maintain the health requirements are eligible for services at the Student Health Center.

The responsibilities of the Student Health staff are varied. The main objectives are to review mandatory health examinations for new students, maintain an accurate medical inventory on all full-time students, provide follow-up care on medical conditions as needed, provide outpatient service during the day, supply information concerning health insurance coverage, and coordinate the various health programs. Under the supervision of the Head of Student Health, these policies are designed to maintain a state of optimum health, both physical and emotional, among the students.

Students receive special rates for mandatory health insurance which provides hospital, medical, and surgical benefits. The coverage is extensive, inexpensive, and compulsory for all students carrying seven or more hours and under the age of 26 years. For all students over 26 years of age it is optional. It is designed to supplement and extend the services provided at the Health Center. Married students may obtain the insurance coverage for their dependents if desired. Brochures containing details of the policy are available at the Health Center.

## COUNSELING AND TESTING

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

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

The Department of Counseling and Testing assists students who fail to meet the scholarship standards of the University, who need help to discover academic weaknesses, and who need help in developing adequate study skills.

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

**Personal Counseling**—The student may meet with professionally trained and experienced counselors individually and/or in groups to discuss adjustment problems of a personal nature. Students who encounter normal uncertainties and stress which interfere with their ability to succeed, i.e., difficulty in social relationships, indecision regarding the draft, personal indecision, and moodiness, may find it helpful to talk with a counselor. All interviews are private and the discussions are kept confidential. The student may apply in person for these services. Student contacts with the counseling service are usually voluntary, although individuals may be referred to the Counseling Center by faculty and other University personnel.

**Testing**—Some tests are required of all new students with less than sophomore standing. The required tests include the test battery prepared by the American College Testing Program. If applicable, a Mathematics Placement Examination and Foreign Language Placement Test are available.

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

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

## STUDENT ORIENTATION SERVICES

In response to the needs of students from rural areas of Alaska and students whose cultural background is different from that of the majority of the campus student body, the University has developed a program called Student Orientation

Services. The primary concern of this program is helping the student make the transition from a small-school and rural environment to the complexities of University life. The program is intercultural in nature in that services are offered to students from all cultural backgrounds. The program is especially responsive to the needs of the Alaska Native student. The initial planning and development of the program was guided by an advisory board of seven Native University students; however, the makeup of the board changes each year as more students take an interest in the activities of Student Orientation Services.

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

Special core courses have been developed in such areas as English, mathematics, and study skills which will aid the student in developing the academic skills necessary for success at the University.

## COCURRICULAR ACTIVITIES

In coordination with the Associated Students of the University of Alaska (A.S.U.A.), the student self-governing body, the Office of Student Affairs promotes and provides staff guidance for the development of a wide range of balanced and contemporary cocurricular activities. A.S.U.A. specifically sponsors the newspaper (*Polar Star*), KMPS radio station, and numerous recreational, social, educational, and service activities. Additionally, many groups representing recreational, religious, departmental, social, and special interests are available for student involvement.

To encourage students to maintain a proper balance between their curricular and cocurricular activities, and to protect the best interests of the University, the following code which determines eligibility for participation in all cocurricular activities and organizations has been adopted by the student governing bodies on campus:

1. Officers of cocurricular activities must maintain a cumulative grade point average of 2.00 or higher while carrying 12 or more semester hours of credit.

2. Additional eligibility requirements for members and officers in University organizations and cocurricular departmental activities may be established by the organization or department. Copies of these regulations shall be kept on file with the Office of Student Activities. The responsibility for enforcing eligibility regulations shall rest with the organization or department.

## ATHLETICS AND RECREATION

Through activities supervised by the Department of Health, Physical Education, and Recreation, students may participate in various programs of intercollegiate, intramural, and recreational sports and fitness activities.

In the Patty Building, facilities are available for recreational basketball, volleyball, badminton, handball, weight training, gymnastics, dance, and swimming. In the air-supported structure which students named the Beluga, students may play tennis (four courts) in the summer and ice skate and play ice hockey in the winter.

In the intramural sports program, men and women students from the different living groups compete in nearly twenty activities each year.

The University of Alaska, Fairbanks, "Nanooks" complete in intercollegiate sports for men and women in basketball, cross-country skiing, rifle, and pistol, and in ice hockey for men. Students may try out for any of these teams by contacting the appropriate coach.

## ALUMNI SERVICES—CAREER PLANNING AND PLACEMENT

The Office of Alumni Services, Career Planning, and Placement is located in Constitution Hall on the University Campus at Fairbanks.

All graduates and former students who have taken courses for credit at the University of

Alaska, including any of its community colleges and branches, who are no longer attending, and whose classes have graduated, are eligible to belong to the Association. There are no dues but members are asked to contribute to the Alumni Fund each year. The *Alaska Alumnus*, a quarterly magazine, is published by the Alumni Office and sent to all Alumni Association member.

Career Planning and Placement is a student personnel service which operates as a division of the Office of Alumni Services. Its purpose is to assist students and alumni in finding professional employment. Employers may notify the office of their need for qualified, university-trained men and women. Arrangements are made through the Placement Office for employers to interview students on campus. The office maintains a job-research service which seeks to provide continuous, accurate information regarding current and anticipated employment condition. All students are encouraged to visit the Placement Office to obtain advice on career planning as early as their sophomore year. They should register for placement assistance and file their credentials at the beginning of their senior year.

# Summer Sessions

A wide range of courses is offered on the University campus at Fairbanks for both graduate and undergraduate credit. There are two sessions each summer, a three-week session in June and a six-week session usually beginning after July 1. These are open to candidates for graduate or undergraduate degrees, and to unclassified students wishing to take special classes or desiring intellectual enrichment without reference to a degree. In addition to the regular courses, there are a number of short courses and workshops throughout the summer period. A maximum of six hours of credit may be earned during the six-week session, and three hours during the three-week session. A post-session Workshop on Alaska (see below) includes subjects such as anthropology, education, history, natural resources, and other Alaskan topics.

Special summer institutes are often funded by federal and state agencies and private foundations. Summer institutes in the teaching of languages, counseling and guidance, English, and the teaching of science and methematics have been held. These institutes are usually open to both residents of Alaska and nonresidents.

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

Special workshops and institutes open to high school age students are also presented. These include the Music Camp and a Youth Leadership Conference. Other programs of a continuing nature include the annual Homemakers' Short Course.

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, gold panning expeditions, hiking, dances, movies, and a riverboat excursion.

Further information is available by writing to the Coordinator of Summer Sessions, University of Alaska, Fairbanks, Alaska 99701. A bulletin listing courses to be offered is available in the early spring of each year.

The Workshop on Alaska is an intensive five-day course composed of lectures, demonstrations, and discussions presented by authorities in specific fields. One full day is devoted to a field trip. For more information, write to Workshop on Alaska, Division of Statewide Services, University of Alaska, Fairbanks, Alaska 99701.

ESTHER DEWITT

*A graduate student, collecting specimens for use in thesis research, emerges from the Arctic Ocean through five feet of ice at the University-operated Naval Arctic Research Laboratory near Barrow, Alaska.*

# Buildings and Facilities

## CAMPUS BUILDINGS

**The Bunnell Memorial Building,** dedicated to the late Charles E. Bunnell, first president of the University, contains general administrative offices, classrooms, laboratories, and a large lecture hall.

**The Brooks Memorial Mines Building** provides space for classrooms, laboratories, offices of the College of Earth Sciences and Mineral Industry, and some offices of the Mineral Industry Research Laboratory. The four-story structure is dedicated to the late Dr. Alfred H. Brooks, Chief Alaskan geologist of the U.S. Geological Survey from 1903 to 1924.

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

**The Eielson Memorial Building** contains general classrooms, laboratories, and the offices of the Division of Statewide Services, including Audio-Visual Communications.

**The William E. Duckering Building** houses offices, classrooms and laboratories of the College of Mathematics, Physical Sciences and Engineering; the Institute of Marine Sciences; laboratories of the State Division of Highways; and the Computer Center.

**The Ernest N. Patty Building,** dedicated to President Emeritus Ernest N. Patty, includes a gymnasium, swimming pool, rifle range, classrooms, and office facilities for the Department of Health, Physical Education and Recreation and the Department of Military Science. The Beluga, an air-supported dome, houses the hockey rink in winter and tennis courts in summer.

**The Museum** exhibits thousands of catalogued specimens of natural and cultural history materials from Alaska and the North. These are part of extensive collections used in teaching, research, and public service.

**The Sydney Chapman Building,** former home of the Geophysical Institute,contains the herbarium, classrooms, and offices.

**Constitution Hall** was completed in 1955 and was the University Student Union Building. It was the site of the convention of territorial delegates which drafted the constitution for the State of Alaska. This building presently provides facilities for a variety of student services and the University Bookstore. The Office of Alumni Services, Career Planning, and Placement is located on the ground level. The basement level accommodates the post office and barbershop. KMPS, the student operated AM radio station is on the top (2nd) floor.

**The William Ransom Wood Center** is the University of Alaska's answer to cabin fever. The bright, spacious building is both colorful and comfortable. The bold, massive architecture complements modern Alaska and, at the same time, recalls her frontier ruggedness.

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

Service-oriented functions of Wood Center include campus information, facility scheduling, lost and found, sundry sales, and campus switchboard. Showers, laundry facilities, and rental lockers are available for use by University members. Darkrooms, a reloading room, 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, bumper pool, table tennis, and bowling lanes. The area is regularly used for tournaments, classes, and open play.

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

**The Hess Dining Commons** is designed to accommodate the students who live in the Moore, Bartlett, and Skarland complex. The dining hall is named for Harriet and Luther Hess.

**The University Commons,** provides food preparation, dining, and lounge facilities for students living in residence halls. Although most meals are served cafeteria style, table service for as many as 570 people is provided for special occasions.

**The Ernest Gruening Building,** new in 1972, houses the College of Behavioral Sciences and Education, The College of Business, Economics, and Government, the Institute of Social, Economic and Government Research, the Center for Northern Educational Research, the Counseling and Testing Center, Student Orientation Services (SOS), the Financial Aid office, and classrooms, laboratories, and offices.

**The Elvey Building** houses the Geophysical Institute, formerly located in the Sydney Chapman Building. It contains facilities for research in arctic and subarctic natural phenomena as well as graduate instruction in geophysics. The impressive six-story structure is located on the west ridge of the campus, overlooking the Tanana Valley and the Alaska Range. The Building bears the name of the late Christian T. Elvey, Director of the Geophysical Institute.

**The Fine Arts and Humanities Complex** provides some of the finest facilities in the country for the fine arts and humanities curriculum. The offices of the College of Arts and Letters are housed in the complex. Features of the building are a 480-seat theatre, a soon-to-be-finished 1,072-seat concert hall, vast art studios, and full-sized FM radio and educational television studios.

**The Resources Building,** opened in 1973, houses offices and laboratories for research programs of the Institute of Agricultural Sciences, the Institute of Water Resources, the Forest Soils Laboratory, part of the Mineral Industry Reserach Laboratory, the U.S. Geological Survey, the U.S. Bureau of Mines, and the State Division of Geological and Geophysical Surveys.

**The Ben J. Atkinson Building** houses the central heating and electric generating facilities for the campus.

**The Health, Safety, and Security Building,** completed in 1973, houses the Student Health Service and the Department of Safety and Security. It adjoins the campus Fire Department building.

On-campus residential facilities for students are described in the Student Affairs section of this catalog.

## ELMER E. RASMUSON LIBRARY

The University of Alaska Library, named for Elmer E. Rasmuson, moved into the new five-level, 10.6-million-dollar Library, Fine Arts, and Humanities complex in the fall of 1969. The library collection consists of more than 370,000 volumes, 11,000 periodical and serial titles, 9,000 reels of microfilm, 500,000 microcards and microfiche, 5,000 maps, and 3,000 phono-records. Book holdings are available on open stacks for the use of patrons during the 81 hours per week the library is normally open. Students and faculty enjoy the open-stack arrangement and the wide circulation of books, so they cooperate with the necessary security check of materials leaving the library. Patrons are asked to leave personal effects outside if they are unwilling to have them examined at the Security Desk. A separate reserve study area is open until 2 a.m.

Materials are classified according to the Library of Congress system. Current acquisitions are received immediately following publication on the English Language Approval Plan (ELAP) for college libraries.

One of the outstanding features of the new facility is the abundance of study areas and lounges. The seating capacity of 1,000 includes individual study carrels for one-third of the student body as well as closed graduate student carrels and research studies for use by faculty members. The graduate carrels and faculty studies are available upon application to the Director of Libraries.

The main book collection is housed on the fourth and fifth levels. Books in Library of Congress classification A through N and oversize are located on the fifth level, P through Z on the fourth. Graduate carrels, seminar rooms, individual study carrels, and smoking rooms are located on each of these levels. Rooms for using personal typewriters also are available.

The main floor of the new library is on level three and contains the circulation and information desks, the card catalog, the separate reserve book room, the reference area, a student lounge area, and study tables and carrels for

student use. The Reader Services department and other library administrative offices are on level three. A special collection of books on Alaska and the polar regions, known as the Skinner Collection, is housed on this level. The bibliography, juvenile, and rare book collections also are located on level three.

The noncirculating collections are housed on level two. These include current periodicals which are on display shelves, bound volumes and microfilm of journals, and the appropriate periodical indexes. Microfilm readers and coin-operated selfservice copy machines are available. A computer printout of all serial and periodical titles held by the library gives call numbers for locating journals, and a serials record file lists complete holdings for each title. Current and back issues of local, national and foreign newspapers are available including the complete run of *The New York Times* and its indexes. A current collection of college and university catalogs is located here. Two lounges add to the comfort of patrons.

Level one houses the documents collection, the University archives and manuscripts collection, the map room, and the microform room. The documents collection constitutes approximately one-fourth of the total library collection. It contains publications of the U.S. government, for which the library is a selective depository. There materials are arranged by the Superintendent of Documents classification.

The microform room is adjacent to the documents collection, and houses the Atomic Energy Commission (AEC) research reports, the Educational Research Information Center (ERIC) publications, the Human Relations Area File (HRAF), and other microfilm, microfiche, and microcard material.

The map room is located in the documents area. Available for use are subject area maps of the countries of the world, an extensive collection of Alaskan maps, U.S. Geological Survey maps of Alaska, and a special collection of rare maps.

The University archives and manuscript collection includes University records and special collections such as the Gruening, Bartlett, Rivers, and Dimond papers, records of the Russian American Company 1802-1869, writings of pioneers, and other original Alaskan material.

Interlibrary loan service is made available to students and faculty through the Reader Services Department of the library. The library's membership in the Pacific Northwest Bibliographic Center and Telex communication direct from the library to PNBC make the resources of the large university libraries in the nation available to the University of Alaska.

## COMPUTER CENTER

The University of Alaska Computer Center provides computing resources for use by the campus community. Deemed an essential element of the University by the University Assembly, the Computer Center is independent of any specific research, administrative, or educational department so that it may serve the entire campus community without prejudice. Located in the lower level of the Duckering Building and with some facilities on the West Ridge, the Center coordinates computing use using a variety of resources. Analog, digital, and time-sharing computers are available.

A small technical staff is available to assist users with their data processing problems. While many campus groups do their own programming, the Computer Center has skilled applications programmers who may be hired on an hourly basis to aid users.

Keypunches are available at the Center for those users who want to punch their own cards. (For those who prefer to have someone else punch their cards, the Comptroller's Office has a keypunching service which is located in the West Wing of the Bunnell Building.) With the exception of the central computer, all of the machines in the Center are on a do-it-yourself basis; however, Computer Center staff members are readily available to demonstrate how these machines operate and are on hand to solve any problems encountered by a user. A user may arrange for an operator for these machines on a charge basis.

The applied computing laboratory is a group associated with the Center. On a contractural basis, they provide a wide range of data processing services, including research, development, and management of computer-related projects.

The central computer is staffed 24 hours a day during the week, and as posted on weekends. Computer time may be purchased by anyone using funds through the individual colleges or institutes. Currently there is a buy-a-priority pricing structure on the 360/40 which gives the user the option of selecting a rate class which

determines the rapidity with which his work will be processed. The three rate classes are:

*Express*—twice the *Standard* rate. Work is placed directly in the computer's hopper.

*Standard* rate—First in, first out basis except for *Express* interruptions.

*Deferred*—about 2/3 *Standard* rate. Work is run when no other jobs are waiting, usually after midnight.

The rate structure is adjusted so that user fees cover the cost of operation. New machines are added whenever they can be justified on the basis of cost benefit.

The services offered include:

**Central Computer**—IBM 360/40 – 128K memory, operating under DOS – POWER. 6 - 2314 disks and 3 tapes, two of which are 9 track 800 bpi and one is 7 track 200,556, or 800bpi. The printer speed is 1200 lines per minute, with 132 print positions. Cards are read at 1000 cards per minute and punched at 300 cards per minute.

**Small Computer**—IBM 1620 with 40K memory and card reader/punch. Both a 10-inch and a 30-inch drum plotter are attached. Software enables programs written for the 360/40 to control the plotters on the 1620.

**Analog Computer**—EAI 380, 24 amplifiers and 8 integrator networks, 2 multipliers, 2 function generators, and a small digital control unit. Peripheral equipment includes an 8½ by 11-inch plotter and a 15-inch oscilloscope.

**Time-sharing**—Time-sharing in the BASIC language is offered. The telephone system is used to connect computer terminals at users' locations to the central facility.

**Other Computers**—The Center provides remote job entry facilities for the UCLA campus computer network, where a 360/91 is available. When a problem warrants the cost of long distance telephone calls, economies can be obtained through the use of the massive computer power at the UCLA facility. Connection to the NCAR facility is being considered, as is connection to other university computer networks. The Center is participating in the development of the Pacific Computer Network, which uses satellite communications to link West Coast, Honolulu, and Japanese computers and to make them available to the needs of the Pacific Rim universities.

Howard Ringley

*Snow lingers, but lightened steps and brightened smiles herald the approach of spring.*

# Public Service

Through Public Service the University makes available to many residents of Alaska in their local communities, or through special training programs, academic credit courses, educational and training programs, and special services such as films, radio and television programs, publications, and consultation services. Public Service makes available many of the educational and training programs sponsored in part by the federal government through such legislation as the Economic Opportunity Act, the Higher Education Act, the Manpower Development and Training Act, the Education Professions Development Act, and the Smith - Lever Act.

**Special Academic Programs** — Academic credit courses are offered at military installations in the Interior and in other communities throughout central and northern Alaska. Summer semesters are conducted at Eielson Air Force Base, Fort Wainwright, Fort Greely, and Nome. Information is available prior to each semester from the Office of the Coordinator, Special Academic Programs, Division of Statewide Services, University of Alaska, Fairbanks, Alaska 99701.

**Workshop on Alaska**—This annual summer workshop is an intensive five-day course composed of lectures, demonstrations, and discussions presented by authorities in specific fields. One full day is devoted to a field trip. For more information, write to Workshop on Alaska, Division of Statewide Services, University of Alaska, Fairbanks, Alaska 99701.

**Correspondence Study** — More than forty academic courses are available through the correspondence study program. In addition, a limited number of noncredit courses is available. Courses to meet the expressed needs of Alaskans are emphasized. Further information and catalogs are available by writing to Correspondence Study, Division of Statewide Services, University of Alaska, Fairbanks, Alaska 99701.

**Mining Extension Program** — The Mining Extension Program, supported by state appropriations, consists of four short courses: Basic Prospecting (four weeks), Geochemical Prospecting (two weeks), Geophysical Prospecting (two weeks), and Rock Identification (three weeks). These courses are offered each year in various communities in Alaska and are open to all persons without regard to previous training or academic qualifications.

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

For additional information, contact the Mining Extension Program, Division of Statewide Services, University of Alaska, Fairbanks, Alaska 99701.

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

For information, contact the Fisheries Extension Program, Division of Statewide Services, University of Alaska, Fairbanks, Alaska 99701.

**Extension Center in Arts and Crafts** — The Division of Statewide Services operates a resident center on campus at Fairbanks for artists and craftsmen who have potential for further development. Young adults are given training in the use of such media as wood, soapstone, and silver. Instruction in basic business methods is also included in the nine-month training program.

For further information, contact the Extension Center in Arts and Crafts, Division of Statewide Services, University of Alaska, Fairbanks, Alaska 99701.

**Adult Vocational Programs**—In cooperation with the Alaska Division of Vocational Education and other agencies, the Division of Statewide Services provides a number of vocationally oriented training programs for adults. Among the programs available are those directed toward improving skills or competencies in occupations related to the travel industry, computer science, village art craftsmen, and business education.

For information, contact Coordinator for Vocational Education, Division of Statewide Services, University of Alaska, Fairbanks, Alaska 99701.

**Nonacademic Credit Short Courses**—A wide range of instruction designed for occupational training, recreation and cultural interest provides opportunities for continuing education to persons with a variety of backgrounds of formal education from a few years in elementary school to those with advanced graduate degrees. The program is totally supported by the enrollment fees. The staff attempts to design courses in line with the expressed desires of persons planning on enrolling for the short courses.

For further information, contact Non-academic Short Course Program, Division of Statewide Services, University of Alaska, Fairbanks, Alaska 99701.

**Conferences**—Many types of conferences are held on the Fairbanks campus. Conferences are sponsored by the various units of the University or by state, federal, or private groups. To arrange for a conference, contact the Conference Coordinator, Division of Statewide Services, University of Alaska, Fairbanks, Alaska 99701.

**Cooperative Extension Service** — The program is a cooperative educational service of the University and the U.S. Department of Agriculture. District offices and field staff are located in Fairbanks, Palmer, Juneau, Homer, Anchorage, Nome, Bethel, and Aniak. University Extension specialists and district Extension agents extend the results of research by the University and a broad range of research institutions to the public. Local people are helped to identify and solve problems and to apply the results of scientific research to the improvement of farms, homes, and communities. Work with young people is conducted through the 4-H and Youth programs.

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

A local-government program is directed toward educating residents of rural communities about the process of incorporation and helping them to achieve an understanding of the roles of elected officials.

The Extension Service has received substantial federal support in recent years to direct expanded educational effort toward improving the nutritional practices of Alaskans. Particular emphasis is focused in this program on the needs of young people and low-income residents. Para-professionals are employed, trained, and supervised in this intensive educational effort with individuals and families.

A five-year educational grant was received in 1973 from the W. K. Kellogg Foundation to provide leadership in broadening post-secondary education for adult Alaska Natives. The $681,000 grant is expected to facilitate development of a broader range of noncredit and credit programs for such residents.

**The Division of Media Services** is divided into four departments: Public Affairs and Production, Public Programming, Audio-Visual and Instructional Services, and Engineering and Maintenance. It supports academic and public service instruction throughout the University of Alaska's statewide system. It also operates two broadcast outlets on the Fairbanks campus.

The division can provide professional and technical expertise in the broad area of media and communication to all facets of the statewide University system and to school districts, other political subdivisions, and agencies.

*The Audio-Visual and Instructional Services Department* is set up to provide many special services to the academic program.

The main branch of the University of Alaska's 16mm film library houses more than 1500 educational films. As a public service function, these films are made available to schools and responsible groups throughout the State. There is a service fee of $3.00 per reel and a catalog is available for $3.00. There is no charge for the University's instructional use of the films.

The Audio-Visual Department provides equipment such as projectors, record players, tape recorders, slide projectors, etc. for on-campus use. It also offers complete photo and graphic services. A cinematographic sector is available. A closed-circuit television studio for ½" and ¾" tape modes is available with cameras for various special needs. Assistance with instructional design and systems is an important and growing part of the instructional services.

*The Radio-Television Programming Department* operates KUAC(FM) radio, 104.7 MHz, and KUAC-TV, Channel 9.

KUAC(FM) is the first educational radio station in Alaska. It serves the University and the greater Fairbanks area as a public service. The station was established in 1962, and now broadcasts seven days a week, year-round, with 10,500 watts of power in stereo. It is a member of NPR — the National Public Radio Network.

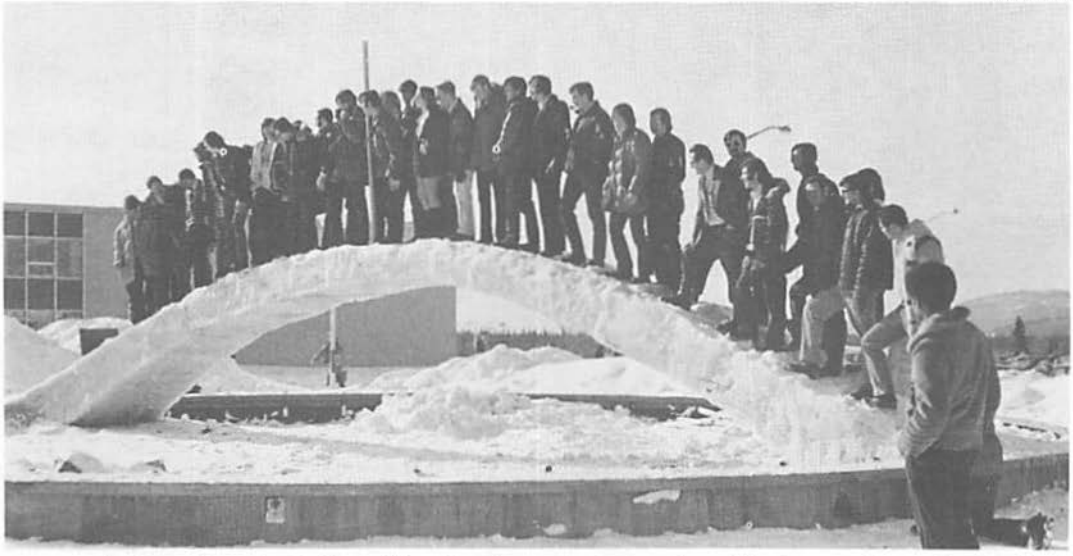
In addition to its program service, KUAC also provides valuable experience for students majoring in speech with a broadcast option and for non-majors who also are interested in broadcasting.

KUAC-TV is the state's first educational television station. With some locally produced programming every night of its seven-night-a-week schedule, the station serves the community with an alternative to the commercial television fare. It is a member of PBS — the Public Broadcasting Service.

*The Department of Radio-Television Production* supports the broadcast activities of the programming department by producing radio and TV programs. Some of these programs are also available for distribution to media outlets statewide. Available to other divisions of the university, school districts, other state agencies, and anyone who is interested in producing radio or television material are the services of the department. All services are on a rate-sheet basis, as are materials.

*The Engineering Department* supports all the divisions, purchasing and maintaining the complex electronic and mechanical devices that modern media operations require.

BILL WOOD



*An ice arch constructed by civil engineering students proved capable of supporting a substantial load.*

HOWARD KINGLEY

*Students in a surveying course practice correct chaining technique.*

# Research

The research programs of the University of Alaska, Fairbanks, take advantage of the University's unique location in the subarctic of Interior Alaska, with easy accessibility to the oceans from the Pacific to the Arctic, accessibility to glaciers and permafrost areas, and a location near the auroral zone, the region in which maximum effects are seen from the bombardment of the earth by charged particles from the sun.

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

**Institute of Agricultural Sciences** — The University conducts an agricultural research program, in cooperation with the U.S. Department of Agriculture, as a part of its land grant university functions. The work of the Institute includes animal science, plant science, economics, and environmental-quality research programs. The Institute has one of its main research centers on the Fairbanks campus. In addition to the director, the professional staff of this center includes one horticulturist, an agronomist, an economist, and an animal scientist.

The major center for research is a facility and farm located in Palmer. Its staff includes five agronomists, two economists, one entomologist, two soil scientists, one dairy scientist, one agricultural engineer, and one plant pathologist. Seven of the Palmer staff are federal scientists, involved in collaborative programs.

A controlled-environment agriculture project, based at Wildwood, is staffed with one horticulturist and a biochemist. Red-meat research facilities are under construction at Homer and Kodiak.

The Institute is currently conducting some 25 projects which provide research opportunities for graduate students.

**Alaska Cooperative Wildlife Research Unit** —The unit is one of several located at land grant colleges and universities. The Alaska unit is jointly sponsored and financed by the University of Alaska, the Alaska Department of Fish and Game, the U.S. Fish and Wildlife Service, and the Wildlife Management Institute. The unit provides technical and professional training in wildlife management, research, education, and administration. The research program of the unit includes ecological and management investigations of big game, waterfowl, marine mammals, furbearers, and upland game species, and often requires close collaboration with biologists of the Alaska Department of Fish and Game, the U.S. Fish and Wildlife Service, and other resource-management agencies.

Graduate work leading to advanced degrees in wildlife management may be performed at the unit in cooperation with the Department of Wildlife and Fisheries.

**Institute of Arctic Biology**—Following the recommendations of a national committee of biologists, the Institute was established in 1963 for studies of life in the special climates of arctic and subarctic regions. Program areas have included zoophysiology, human ecology, plant physiology, zoochemistry, veterinary science, microbiology and biophysics. The staff of about 75 persons, including doctoral candidates, encompasses biological specialties ranging from biophysics and physical chemistry through physiological ecology and ethology.

The Institute is located in the Laurence Irving Building for bioscience, which provides a variety of technical and instrumental facilities and services. Special field sites include the contiguous 40-acre Experimental Biological Campus Reserve, the Cantwell Reindeer Station near Mt. McKinley Park, the Gambell Station on St. Lawrence Island in the Bering Sea, the Homer and Halibut Cove shore stations on Kenai's Kachemak Bay, and the alpine tundra site at Eagle Summit.

Interdisciplinary Ph.D. programs can be arranged in various subject areas for qualified applicants, who usually enter with an M.S. degree or its equivalent in graduate course work. Visiting scientists from other states and countries are welcomed.

**Arctic Environmental Information and Data Center** — The 1971 session of the Alaska legislature, recognizing a need for a central source of statewide environmental knowledge and data, authorized and established within the University system the Arctic Environmental Information and Data Center. The Center, located in Anchorage, is striving to meet the needs of government, industry, the academic community, and the public by creating an information retrieval network for, and by furnishing analytical reports on, resource and environmental questions, issues, and problems.

In its first year of operation, the Center concentrated on the development of a system of referral and contact with all available sources of environmental knowledge on Alaska. Three components of this development program are: (1) a current awareness profile of ongoing research in Alaska; (2) a bibliography, i.e., abstract and data referral and retrieval system; and (3) an information network linking AEIDC with other centers of resource and environmental-science information on the North.

Paralleling the information system has been the building of an interdisciplinary resource and scientific professional staff to research, analyze, or synthesize environmental and resource knowledge in special-purpose efforts requested by State and Federal agencies, Native organizations, local government, and industry.

**Geophysical Institute**—The Institute was opened in 1949. It is now housed in the C.T. Elvey Building on the West Ridge of the Fairbanks campus. The present staff numbers approximately 180, including some 20 graduate students who are employed as research assistants. Financial support is obtained mainly from federal agencies. The research program deals with phenomena that can best be studied at high latitude or which present special problems in Alaska. Programs are established in upper atmospheric physics and chemistry, the aurora, the earth's magnetic field, radio communications, solar-terrestrial physics, meteorology, glaciology, seismology, volcanology, and several fields of geology and geochemistry. An important aspect of much of the work is the application of existing knowledge to polar problems — for example, improving radio communication services in the arctic, assessing the earthquake risk in Alaska, reducing the effects of ice fog and air pollution, and providing advisory services to local government.

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

**Institute of Marine Science**—The Institute of Marine Science was established in 1960 by the Alaska State Legislature for the purpose of advancing oceanographic knowledge with emphasis on problems of the northern regions. Included in this broad scope is a graduate program of education and research in basic biological, chemical, geological, and physical oceanography and applied areas.

The present staff of about 100 personnel includes 30 faculty members and 20 graduate students with specialties distributed among the natural science disciplines encompassed by oceanography. Financial support for research is obtained mainly from federal sources. In practicing an interdisciplinary approach to applied problem-solving, the Institute has undertaken such programs as baseline environmental studies at both ends of the proposed trans-Alaska pipeline (on the Colville River Delta and the Arctic Ocean and in the Port Valdez prospective terminus area), siting of the effluent discharge system for the Collier Carbon Urea Plant in Cook Inlet, development of aquaculture in fjord systems, and advisory services to marine-oriented industries and agencies. Advanced degrees at both the M.S. and Ph.D. level are offered through the Oceanography and Ocean Engineering program in cooperation with the College of Mathematics, Physical Sciences, and Engineering.

Research facilities include Fairbanks Campus laboratories in the Duckering Building and a coastal laboratory and oceanographic support station at Seward. In addition, field stations are situated at Izembek Lagoon (Cold Bay —Aleutian Area), on the Colville River Delta, and

at Point Barrow in cooperation with the Naval Arctic Research Laboratory. The Institute operates the 85-foot modern oceanographic Research Vessel *Acona* and several small auxiliary craft. Scientists are invited to request permission to work in residence.

**Mineral Industry Research Laboratory** — The 1963 Alaska State Legislature authorized a mineral industry research program at the University, resulting in the establishment of the Mineral Industry Research Laboratory within the College of Earth Sciences and Mineral Industry. The laboratory conducts basic and applied research in many phases of the mineral industry, mostly directed toward the development of Alaska's mineral resources. Many of the programs are coordinated with graduate academic study.

Work so far has included studies of the geology and mineral deposits of the state, computer applications in exploration, feasibility studies for various Alaskan minerals, beneficiation of Alaskan ores, geologic mapping of areas of economic interest, development of a data storage and retrieval program for Alaskan mineral deposits, transportation systems for the mineral industry, and several aspects of Alaska's coal deposits.

**The Naval Arctic Research Laboratory (NARL)** — The Naval Arctic Research Laboratory is operated by the University of Alaska under contract with the Office of Naval Research. It was established in 1947 to provide facilities and logistic support for research in the Arctic regions. Throughout its history, the NARL has supported hundreds of scientists and investigators from leading universities and institutions.

The main laboratory facilities are located at Barrow, Alaska. In addition, the NARL operates a network of field stations at various locations on the north slope and on the Arctic Ocean ice pack. A permanent ice station—Fletcher's Ice Island, or T-3 — has been in operation in the polar ice pack on a year-round basis since 1962.

**Center For Northern Educational Research** — Research and program development in education was initiated in the winter of 1971 by establishment of the Center for Northern Educational Research by resolution of the Board of Regents. The Center, an educational policy analysis, research, and program-development institute, has the following purposes:

1. The analysis of long-range goals and policies of public education in cooperation with state, local, and federal educational agencies, legislative bodies, Native Associations, educational associations, and related governmental agencies.

2. The identification and design of Alaskan research projects appropriate to new educational concepts.

3. The development of educational programs and demonstration projects and their field testing, including assistance to operating educational agencies in the implementation of newly developed programs.

Current programs consist of long-range educational policy and goal analysis in cooperation with the State and the Bureau of Indian Affairs, research and materials development in bilingual education, the Allakaket Learning Center experiment, satellite-transmitted educational program development, Native studies curricula development, Alaska Native Language Program, research on bilingualism and its effects on cultural identity, evaluation of affective education in a Juneau junior high school, evaluation of commercial programed teaching materials in vocational education, the Alaska Educational Program in Intercultural Communication, research on the alternative means to deliver educational services to the unorganized borough, and research in the desirability and feasibility of full state school support.

4. The provision of a forum from which the Native population may join with formal educational agencies and other units of government in the development of cross-cultural educational programs.

**Sea Grant Program** — Throughout Sea Grant's brief history, the program has emphasized the acquisition, dissemination, and application of knowledge pertinent to the development of Alaska's underutilized marine resources and little-understood coastal environment.

Program activities are coordinated in eight functional areas of marine affairs and marine resource development. These include academic education, marine advisory services, and six categories of research: renewable marine resources, aquaculture, marine mammals, Arctic coastal engineering, ecosystems studies, and coastal zone studies.

Areas of cooperative research and investigation are given particular attention, such as the mutual program activity on marine mammal investigations between University and Department of Fish and Game scientists and the arctic ice and seabed investigations of University scientists performed with oil industry cooperation.

Significant too have been the initiation of fisheries technology curricula development supported by Sea Grant within the coastal community colleges of the state and the relatively large program increase given to fisheries extension activities. These two responses to the improvement of Alaska's fisheries industry are scheduled for even greater expansion, as is the University's capability to execute meaningful fisheries research in cooperation with state and federal agencies.

**Institute of Social, Economic and Government Research**—ISEGR was established in 1961 by the Alaska State Legislature for the purpose of conducting interdisciplinary policy- and problem-oriented research in the social sciences and related fields. Research interests include economic planning and development, utilization of natural resources, human ecology, educational needs and problems, governmental institutions and political processes, community organization and development, communications, environmental policy, and the political, sociological, and psychological dimensions of culture change. While concentrating primarily on Alaska, ISEGR work and interests also extend to northern Canada, the North Pacific Basin (including Japan and Siberia), and the arctic circumpolar region.

In addition to research directed toward socioeconomic problems, ISEGR carries out a broad-scale program of technical assistance to public and quasi-public agencies, collects and disseminates statistical data and other information on Alaska's population and economy, and otherwise serves the needs of the general public. The institute has a multidisciplinary professional staff; it also utilizes other university faculty and students, as well as professionals from other universities, in its research and service activities.

ISEGR's publication series includes *The Alaska Review of Business and Economic Conditions, ISEGR Reports, Occasional Papers,* and *Research Notes.* Reports, books, and other publications are distributed directly by the institute, sold in bookstores, and made available nationally through the University of Washington Press.

**Institute of Water Resources**—The Institute of Water Resources was established in 1965 to carry on an integrated program of research in problems dealing with the water resource environment of Alaska. The studies completed by the Institute have encompassed many water resource areas, including: waste treatment, arctic hydrology, water quality management, biological effects of pollution, water resource economics, thermal pollution, and hydrodynamics. The current interests of the professional staff include: physical, chemical, and biological waste treatment in cold climates; the hydrology of arctic regions with special emphasis on techniques which are useful in sparse data regions; the effects of thermal discharges into arctic streams; environmental planning in developing recreational areas; the effects of urbanization of watersheds; the environmental effects of development of lakes and streams; and the pathways of pollutants in the natural water system. The Institute's laboratories and offices are available to interested graduate students who desire to work in problems dealing with the water resource environment. The present staff of twenty-five includes fifteen graduate students who are completing their research programs in cooperation with the various academic colleges on the Fairbanks campus. The professional staff maintains a vigorous interest in graduate and undergraduate teaching, and most of its members hold joint appointments with one or more academic departments.

**Forest Soils Laboratory**—This laboratory was established in 1965, under a grant from the Hill Family Foundation, for the purpose of considering the unique problems dealing with forest soil-plant relations encountered under subarctic conditions. The laboratory is currently staffed by two professionals whose research interests encompass soil-plant relations and plant physiology. Graduate student programs at the masters and Ph.D. levels are available in a variety of subject-matter areas related to these major areas of forest biology. Technical laboratory support is provided by laboratory technicians.

Laboratory activities encompass a relatively wide range of field and laboratory research dealing with physical, chemical, and biological

soil properties in relation to forest tree growth, including tree nutrition and physiology. In support of these activities the laboratory is equipped to carry out soil physical, chemical, and biological analysis and plant-tissue testing. An infrared gas analysis system extends this capability in the area of photosynthesis.

A number of field study sites have been established during the past seven years in areas representative of the major vegetation types in interior Alaska. Soil-plant relations research conducted at these sites is providing baseline information on structure and function of selected taiga forest ecosystems.

# State and Federal Agencies on Campus

**Arctic Environmental Research Laboratory** —This multi-million-dollar facility is a research laboratory for the U.S. Environmental Protection Agency. The Laboratory conducts research on environmental problems in cold climates. Water-related problems account for most of the research underway; however, air pollution and solid waste management needs are also part of the Laboratory mission. The AERL also administers the Alaska Village Demonstration Project, which was authorized by Congress, to demonstrate a central facility for safe water supply, bathing, laundry, and sewage disposal in one or more Native villages in the State. This federal laboratory, although not affiliated with the University of Alaska, is part of the growing arctic research effort on the Fairbanks campus of the University of Alaska.

**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, nonmetallic, coal, and oil deposits; regional studies of structure and stratigraphy; detailed studies of selected type-areas; application of geology to engineering and related problems; and research in the use of new geologic methods. The Alaskan maps and geological reports are available to the public for use in the office.

**College Observatory**—The College Magnetic and Seismological Observatory is operated by the Branch of Regional Geophysics of the U.S. Geological Survey, with the main facility on the West Ridge of the Fairbanks Campus and an outpost facility near Farmer's Loop Road. Originally constructed in 1947, the observatory has expanded to 29 buildings and operates various instruments that continuously gather data for studies in the fields of geomagnetism and seismology. Prior to 1948 the magnetic observatory was at a different location on the Fairbanks campus. 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. The piers used for the magnetic instruments from 1941 to 1948 were the same ones that were used for the Second International Polar Year (1932-1934). The 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 to 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 is also responsible for overseeing the operation of the Barrow Observatory at Point Barrow in cooperation with the University's Naval Arctic Research Laboratory.

**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, located 23 miles from the Fairbanks campus is a convenient research location for Forest Service and University scientists.

**State Division of Geological and Geophysical Surveys** — This division of the Alaska Department of Natural Resources maintains offices on campus in the Resources, Elvey, and Services buildings. The staff numbers 25, including mining geologists, an engineer, laboratory personnel, mining information specialists, and publications personnel. The laboratory provides analytical services to the staff and public and also conducts independent research. Field programs, including prospect examinations, are carried out by the geologists and engineer. Technical information and advice is available to prospectors and exploration companies. An up-to-date file of mining claims and mineral occurrences is maintained. Monthly bulletins, project reports, maps, and pamphlets summarize the Division's activities. Cooperative investigations with University personnel and government agencies contribute to the knowledge of Alaskan geology.

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

**State Office of Research and Academic Coordination** — This office is maintained on campus by the Alaska Department of Environmental Conservation. It provides services as a staff function within the department. ORAC's objectives include improving and strengthening research and academic contributions to environmental conservation. In cooperation with the University and other government agencies, it also provides assistance in the solution of environmental engineering problems encountered in water supply, waste disposal, housing, community development, etc., in the far north.

Esther DeWitt

*A scientific glassblower prepares laboratory apparatus at the Institute of Marine Sciences. A noncredit short course in glassblowing is offered as demand warrants.*

# Academic Colleges

The academic programs of the University of Alaska, Fairbanks, are administered by six colleges. The goals of these are outlined here, with listings of the degrees they offer. Instructional personnel listed for the various departments of the college are those of the 1973-74 academic year.

## COLLEGE OF ARTS AND LETTERS

Walter J. Mueller, *Dean*

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

**Undergraduate Degrees** — The College of Arts and Letters offers the Associate in Arts degree with a major in Liberal Arts, the Bachelor of Music degree, and the Bachelor of Arts degree with majors in Art, English, French, German, Inupiaq Eskimo, Journalism, Linguistics, Music, Peace Arts, Philosophy, Russian, Russian Studies, Spanish, Yupik Eskimo, Speech, Speech Communications, and Theater. The college also offers minors for the Bachelor of Arts in these subjects.

**Graduate Degrees** — The College of Arts and Letters offers the Master of Arts degree in English and the Master of Fine Arts degree in Creative Writing. Students also may earn an M.A. or M.F.A. degree in other fields through an interdisciplinary program. The Master of Arts in Teaching is also offered.

### Alaska Native Languages Program

*Professor and Chairman:* Michael E. Krauss
*Assistant Professor:* E. Irene Reed
*Lecturers:* Edna MacLean, Katherine Peter

### Department of Art

*Department Head and Assistant Professor:* Glen C. Simpson
*Professor:* Helmut Van Flein
*Associate Professor:* L. Stanley Zielinski
*Distinguished Associate:* Fred Machetanz
*Assistant Professor:* Terence T. Choy

### Department of English

*Department Head and Associate Professor:* I. June Duncan
*Professor:* Charles J. Keim
*Associate Professor:* John W. Bernet
*Assistant Professors:* George R. Allen, Shigeo J. Aso, Russell L. Currier, Mary H. Slotnick, Russell Tabbert
*Instructors:* Norma Bowkett, Sarah Isto, Kenneth Oberrecht, Anne San Chez, Patricia Sheehan, David Stark

### Department of Journalism

*Department Head and Professor:* Jimmy Bedford
*Professor:* Charles J. Keim
*Assistant Professors:* Evan B. Smith, John Ullmann

### Department of Linguistics and Foreign Languages

*Department Head and Professor:* Bruce R. Gordon
*Professors:* Wolf Hollerbach, Walter J. Mueller
*Associate Professor:* Louis L. Renner
*Assistant Professors:* Joseph Brenckle, Jang Koo, Gunther Matschke
*Lecturer:* Patricia Deitz

### Department of Music

*Department Head and Professor:* Charles W. Davis
*Professor:* Jean-Paul Billaud
*Associate Professor:* Duane J. Mikow

*Assistant Professors:* Lynne Greenwood, Thomas Johnston, Gordon B. Wright
*Instructor:* David Stech
*Lecturers:* Paul Rosenthal, Gaynor Trammer

**Department of Philosophy**
*Department Head and Professor:* Rudolph W. Krejci
*Professor:* Walter J. Benesch

**Department of Speech, Drama, and Radio**
*Department Head and Assistant Professor:* Walter G. Ensign, Jr.
*Professor:* Lee H. Salisbury
*Assistant Professors:* John T. Duncan, Shelia Herriott, Theda Sue Pittman, Donald P. Upham
*Instructors:* Philip Backlund, Mark E. Bergeson
*Lecturer:* James C. Bell

## COLLEGE OF BEHAVIORAL SCIENCES AND EDUCATION

Charles K. Ray, *Acting Dean*

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

**Undergraduate Degrees** — The college has programs that lead to an Associate in Arts degree in Early Childhood Development and to Bachelor of Arts degrees in Anthropology, Physical Education, Psychology, and Sociology. The Bachelor of Education degree is awarded to students majoring in Education. The Bachelor of Science degree is awarded to students majoring in Anthropology, Home Economics, Physical Education, Psychology, and Sociology.

**Graduate Degrees** — Master of Arts in Anthropology; Master of Arts in Teaching; Master of Education, and Educational Specialist.

**Department of Anthropology**
*Department Head and Assistant Professor:* John P. Cook
*Associate Professor:* William J. Loyens
*Assistant Professors:* W. Roger Powers, G. Richard Scott, Anne D. Shinkwin

**Department of Education**
*Department Head and Associate Professor:* Dana C. Moore
*Professors:* Joan B. Clutts, Arnold A. Griese
*Associate Professors:* Winifred D. Lande, William K. Pennebaker, John L. Turner
*Assistant Professors:* Raymond J. Barnhardt, Franklin J. Gold, David J. Mangusso, Lillian P. Stinson

**Department of Health, Physical Education, and Recreation**
*Department Head and Associate Professor:* John C. Gilmore
*Associate Professor:* Allen R. Svenningson
*Assistant Professors:* Nancy E. Frith, Alan H. Silver, William L. Smith, Theresa H. Tomczak

**Department of Home Economics**
*Department Head and Associate Professor:* Ann L. Walsh
*Associate Professor:* Sally M. Wellman
*Assistant Professor:* Jewel B. Smith
*Instructors:* Marjorie M. Fields, Sarah C. Klingel
*Supervisor of Nursery School:* Melissa Muchewicz

**Department of Military Science**
*Department Head and Professor:* Paul D. Vanture, Lt. Col.
*Assistant Professors:* Roy S. Carlson, Jr., Capt., James A. Fenlon, Maj., Lawrence P. Lauck, Maj.

**Department of Psychology and Sociology**
*Department Head and Assistant Professor:* Richard G. Possenti
*Associate Professor:* Sarkis Atamian
*Assistant Professors:* Richard D. Brummett, Wayne R. Dexter, Theodore L. Drahn, Nagabhushana Rao, John G. Richardson

## COLLEGE OF BIOLOGICAL SCIENCES AND RENEWABLE RESOURCES

Charles E. Behlke, *Acting Dean*

Biology is an area of science in which many disciplines come to bear; in fact, biology is in large part the summation of these various disciplines. A thorough knowledge of biology, in

both its pure and applied phases, is fundamental to the welfare of mankind. With these axioms in mind, the programs in the College of Biological Sciences and Renewable Resources are designed to give students an introduction to the humanities and social sciences, a background in mathematics and the physical sciences, a firm foundation in basic biological sciences, and advanced training in specialized fields. For more details, students should read descriptive materials in the Degree Programs Section.

**Undergraduate Degrees**—Bachelor of Arts in Biological Sciences; Bachelor of Science in Biological Sciences, Fisheries Biology, Medical Technology, Natural Resources, Wildlife Management.

**Graduate Degrees** —Master of Science in Botany, Biology, Fisheries Biology, Land Resources (Interdisciplinary), Wildlife Management, Zoology; Master of Arts in Teaching; Ph.D. (Interdisciplinary).

### Department of Biological Sciences

*Department Head and Associate Professor:* David F. Murray

*Professors:* Brina Kessel, Bonita J. Neiland, James E. Morrow, Russell D. Guthrie, L. Gerard Swartz

*Associate Professors:* Howard M. Feder, Stephen F. MacLean

*Assistant Professors:* Russell L. Shoemaker, Ronald L. Smith

*Lecturer:* Arla Scarborough

*Associated Faculty:* Richard Lyons, Associate Professor, Medical Science; Jon Lindsay and Darryl Williams, Assistant Professors, Medical Science

### Department of Land Resources and Agricultural Science

*Department Head and Professor:* Bonita J. Neiland

*Assistant Professor:* John Fox

*Associates in Forestry:* Roy Beckwith, Austin E. Helmers, John C. Zasada

*Associate in Watershed Science:* Charles W. Slaughter

*Associated Faculty:* Victor E. Fischer, Director, Institute of Social, Economic, and Government Research, and Professor of Political Science; Robert B. Weeden, Professor of Wildlife Management; Donald H. Dinkel, Associate Professor of Plant Physiology, Institute of Agricultural Sciences (I.A.S.); Keith Van Cleve, Associate Professor of Forestry; Alan C. Epps, Extension Horticulturist and Assistant Professor of Extension; Don C. Tomlin, Assistant Professor of Animal Science, I.A.S.; Frank Wooding, Assistant Professor of Agronomy, I.A.S.

### Department of Wildlife and Fisheries

*Department Head and Associate Professor:* Samuel J. Harbo

*Professors:* Frederick C. Dean, David R. Klein, Robert B. Weeden

*Adjunct Professor:* Robert Rausch

*Associate Professor:* Peter C. Lent

*Adjunct Associate Professors:* Francis Fay, Calvin Lensink

*Assistant Professor:* Robert T. Cooney

*Adjunct Assistant Professors:* James Bartonek, Robert LeResche

### Alaska Cooperative Wildlife Research Unit

*Leader:* David R. Klein

*Assistant Leaders:* Samuel J. Harbo, Jr., Peter C. Lent

### Alaska Cooperative Park Studies Unit

*Leader:* Frederick C. Dean

## COLLEGE OF BUSINESS, ECONOMICS, AND GOVERNMENT

Charles K. Ray, *Acting Dean*
Richard Solie, *Associate Dean*

The college offers programs of study which prepare young men and women for responsible professional careers in private and public organizations. This objective imposes the obligation of making available substantial programs of study to prepare literate, articulate, and liberally educated business specialists; to provide depth and breadth of knowledge of fundamental economic laws. An aim is to provide a broad perspective combined with specialization required to meet cultural, academic, and professional needs.

Specifically, the aims of the college are: (1) to educate students for positions in business, industry, government, and other organizations which require analytical and decision-making ability; (2) to provide those who wish to prepare themselves for positions of responsibility in industry and government with the basic

understanding of the economic, political, and social environment; (3) to offer courses in accounting, business administration, economics, history, office administration, and political science which meet the needs of the students, some of whom may intend to prepare themselves for graduate study or to enter the teaching profession; (4) to acquaint students with the problems and opportunities of economic, political, and social development in Alaska and the northern region of which it is a part; (5) to instruct students in social science research techniques; and (6) to prepare students for positions of civic leadership.

**Undergraduate Degrees**—The college grants the following undergraduate degrees: Bachelor of Business Administration, with majors in Accounting and Business Administration; Bachelor of Arts in Economics, History, Office Administration, and Political Science; Bachelor of Science in Economics; Associate in Office Administration; Associate in Arts in Accounting, Business Administration, and Police Administration; Associate in Computer Information Systems; and a one-year certificate in Office Administration.

**Graduate Degrees**—Programs leading to the Master of Business Administration degree, Master of Arts in Teaching in History, and the Master of Arts in History degree are offered to qualified students.

**Department of Accounting**
*Department Head and Associate Professor:* Milton Fink
*Visiting Professor:* Frank Bain
*Associate Professor:* Robert Calvert
*Instructors:* Jim Oehring, Beverly Staley

**Department of Business Administration**
*Acting Department Head and Assistant Professor:* Mary Lou Roberts
*Assistant Professor:* Howard Zach
*Visiting Assistant Professor:* Norman Boelts
*Lecturers:* Jeffry Cook, J. Douglas Foster, Anthony Frol, Lloyd Hoppner, Mike McCrockin

**Department of Economics**
*Department Head and Professor:* Richard Solie
*Professor:* Arlon Tussing
*Visiting Professor:* David Kresge
*Assistant Professors:* Neville Beharie, M. Saleem Khan, Franklin L. Orth, Jr., Robert Snyder, Wayne Thomas, William Workman

**Department of History**
*Department Head and Associate Professor:* William Hunt
*Professors:* Orlando Miller, Herman Slotnick
*Associate Professors:* Peter Cornwall, Claus Naske
*Assistant Professor:* James Foster
*Instructor:* Walter Soboleff

**Department of Office Administration**
*Department Head and Associate Professor:* Melba Pelosi
*Assistant Professors:* Radene Halverson, Patricia Turner
*Instructor:* Sue Shoemaker

**Department of Political Science**
*Department Head and Associate Professor:* Ronald Chinn
*Associate Professors:* Gordon Harrison, Thomas Morehouse, R. London Smith
*Assistant Professors:* Andrea Helms, Robert Hilliard
*Lecturers:* Richard Burke, Lloyd Hoppner, Gary Ramaeker, John Wilt

## COLLEGE OF EARTH SCIENCES AND MINERAL INDUSTRY

Earl H. Beistline, *Dean*

The objectives of the College of Earth Sciences and Mineral Industry are: to prepare students for their places as contributive citizens and for professional careers in disciplines such as geography, geology, and mineral industry. The college also seeks to carry on research and development work that will add to basic knowledge as well as assist in the discovery, recovery, and utilization of mineral resources.

**Undergraduate Degrees**—The college has programs that lead to a certificate or an associate degree in Mineral and Petroleum Technology; Bachelor of Science Degrees in Geography, Geography and Regional Development, Geology, Geological Engineering, and Mining Engineering. A Bachelor of Arts degree with majors in Geography, Geography and Regional Development, and Earth Science may be earned.

**Graduate Degrees**—Programs leading to a Master of Science degree are offered in Geology, Mining Engineering, and Mineral Preparation Engineering; an M.A.T. degree is offered in

Geology. The Geography Department participates in the interdisciplinary program in Regional Development which may lead to a Master of Science or Master of Arts degree.

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

The Geology Department offers the Ph.D. degree. Interdisciplinary research and study programs leading to the doctorate are available through cooperative arrangements between the department and the Geophysical and Marine Science institutes.

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

**Related Agencies**—Close association is maintained with the Geophysical Institute, Institute of Marine Science, U.S. Geological Survey, U.S. Bureau of Mines, and Alaska Division of Geological and Geophysical Surveys, all of which have offices on the Fairbanks campus. Some personnel and equipment are used on a cooperative basis for both teaching and research.

### Department of Geography

*Department Head and Professor:* Herbert H. Rasche

*Associate Professor:* Donald F. Lynch

### Department of Geology

*Department Head and Professor:* Daniel B. Hawkins

*Professors:* Carl S. Benson, Robert B. Forbes

*Associate Professors:* Richard C. Allison, Donald J. Grybeck, Thomas Hamilton, David Stone, Don M. Triplehorn, Donald Turner

*Adjunct Associate Professor:* Thomas E. Smith

*Assistant Professors:* Nirendra N. Biswas, Wyatt Gilbert, Jurgen Kienle

*Distinguished Lecturer:* Florence R. Weber

### Department of Mineral Engineering

*Department Head and Professor:* Chris A. Lambert, Jr., P.E.

*Professors:* Earl H. Beistline, P.E., Donald J. Cooke, P.E.; Ernest N. Wolff, P.E.

*Assistant Professor:* Nils I. Johansen, P.E.

*Associate in Mining Engineering:* Douglas B. Colp, P.E.

*Lecturer:* Charles A. Champion, P.E.

### Mineral Industry Research Laboratory

*Associate Director and Geologist:* Ernest N. Wolff, P.E.

*Associate Professor of Coal Technology:* P. Dharma Rao

*Associate Professor of Geography:* Donald F Lynch

*Associate Professor of Geology:* Donald J. Grybeck

*Associate Professor of Geological Engineering:* Nils I. Johansen, P.E.

## COLLEGE OF MATHEMATICS, PHYSICAL SCIENCES, AND ENGINEERING

Charles E. Behlke, *Dean*

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

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

**Undergraduate Degrees** — The college grants the following undergraduate degrees: Associate in Electronics Technology, Associate in Chemical Science, Associate in Applied Science, Bachelor of Arts, Bachelor of Science.

**Graduate Degrees** —The college offers the following graduate degrees: Master of Arts, Master of Arts in Teaching, Master of Science, Master of (Civil, Electrical, Environmental Health, Mechanical) Engineering, and Doctor of Philosophy.

**Departments** — Departments in the college include: Chemistry and Chemical Engineering, Civil Engineering, Electrical Engineering, Engineering Management, General Science, Mathematics, Mechanical Engineering, and Physics. The college also includes within its scope

the program in Electronics Technology, the program in Environmental Quality Engineering, and the program in Oceanography and Ocean Engineering.

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

**Department of Chemistry**
*Department Head and Associate Professor:* L. Claron Hoskins
*Associate Professors:* Charles Genaux, G. Warren Smith
*Assistant Professors:* Donald Lokken, Paul B. Reichardt

**Department of Civil Engineering**
*Department Head and Professor:* John L. Burdick, P.E.
*Professors:* Charles E. Behlke, P.E.; William Mendenhall, Jr., P.E.; E.F. Rice, P.E.
*Associate Professors:* Gary L. Guymon, George R. Knight, P.E.
*Lecturer:* William B. Fuller, P.E.
*Lecturer and Supervisor of Laboratories:* K.H. Hobson, P.E.

**Department of Electrical Engineering**
*Department Head and Associate Professor:* William M. Sackinger, P.E.
*Professors:* Howard Bates, J. Robert Eaton, Robert Merritt, P.E.
*Associate Professors:* Edward J. Gauss, P.E.; N.A. Lindberger, Thomas D. Roberts
*Assistant Professors:* Kenneth Kokjer, James P. Rogers

**Department of Engineering Management**
*Department Head and Associate Professor:* F. Lawrence Bennett, P.E.
*Professor:* John M. Hilpert

**Department of General Science**
*Acting Department Head and Professor:* Charles E. Behlke

**Department of Mathematics**
*Department Head and Professor:* Robert W. Brown
*Professor:* William R. Cashen
*Associate Professors:* John O. Distad, Barbara Lando, Clifton Lando, Phillip A. Van Veldhuizen
*Assistant Professors:* Patricia Andresen, Gary A. Gislason, Robert Sullivan
*Instructors:* Barbara Williams, Susan B. Royer

**Department of Mechanical Engineering**
*Department Head and Professor:* James B. Tiedemann, P.E.
*Assistant Professor:* Richard D. Nelson

**Department of Physics**
*Department Head and Professor:* J. Roger Sheridan
*Associate Professors:* John L. Morack, John S. Murray, Thomas E. Osterkamp

**Electronics Technology Program**
*Program Head and Associate in Electronics Technology:* Foye L. Gentry
*Associate in Electronics Technology:* Richard McWhirter
*Assistants in Electronics Technology:* Arthur L. Dennis, Gregory J. Jennings, William Powell, Michael Scibor

**Environmental Quality Engineering Program**
*Program Head and Assistant Professor:* Timothy Tilsworth
*Assistant Professor:* Daniel W. Smith

**Oceanography and Ocean Engineering**
*Program Head and Associate Professor:* Vera Alexander

# Degree Programs

## ACCOUNTING

*College of Business, Economics, and Government*

**Degrees:** Associate in Arts in Accounting, Bachelor of Business Administration
**Minimum Requirements for Degree:**
A.A.—60 Credits, B.B.A.—130 Credits

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

**Accounting—A.A. Degree**
1. Complete the general University requirements as listed on page 27.
2. Complete the following degree and program (major) requirements:

| | *Credits* |
|---|---|
| Written Communication | 6 |
| Oral Communication | 3 |
| Mathematics—including Math. 110 | 6 |
| Economics 51 and 52 or 121 and 122 | 6 |
| At least six credits in one of the following areas: Humanities, Natural Science, or other (Acc., B.A., O.A., H.E., Mil., P.E., etc.) | 6 |
| Acc. 51—Intro. to Accounting I | 3 |
| Acc. 52—Intro. to Accounting II | 3 |
| Acc. 85—Tax Accounting | 3 |
| Acc. 101—Elementary Accounting | 3 |
| Acc. 102—Elementary Accounting | 3 |
| O.A. 63—Adding and Calculating Machines | 3 |
| CIS 101—Intro. to Data Processing | 3 |
| B.A. 151—Intro. to Business | 3 |
| B.A. 280—Principles of Management | 3 |
| Electives | 6 |

**Accounting—B.B.A. Degree**
1. Complete general University requirements and B.B.A. degree requirements, pages 27 and 29.
2. Complete the following program (major) requirements:

| | *Credits* |
|---|---|
| B.A. 325—Financial Management | 3 |
| B.A. 331-332—Business Law | 6 |
| B.A. 243—Marketing | 3 |
| B.A. 371—Business Data Processing | 3 |
| Econ. 321—Intermediate Microeconomics | 3 |
| Econ. 328—Statistical Methods | 3 |
| Econ. 350—Money and Banking | 3 |
| B.A. 280—Principles of Management | 3 |
| B.A. 462—Administrative Policy | 3 |
| Electives—Business Admin. & Econ. | 0-26 |
| Acc. 310—Income Tax | 3 |
| Acc. 311-312—Intermediate Accounting | 6 |
| Acc. 342—Managerial Cost Accounting | 3 |
| Acc. 401—Advanced Accounting | 3 |
| Acc. 452—Auditing | 3 |
| Electives—Accounting | 0-15 |
| Complete any *two* of the following: Acc. 316—Acc. Information Systems *or* Acc. 402—Governmental Accounting *or* Acc. 403—Advanced Taxes *or* Acc. 404—Advanced Managerial Cost Acc. *or* Acc. 405—Contemporary Issues in Acc. | 6 |

**Requirements for a Minor in Accounting**

| | *Credits* |
|---|---|
| Acc. 101—Elementary Accounting | 3 |
| Acc. 102—Elementary Accounting | 3 |
| Acc. 310—Income Tax | 3 |
| Acc. 311—Intermediate Accounting | 3 |
| Acc. 342—Managerial Cost Accounting | 3 |
| Another 300- or 400-level accounting course | 3 |
| Total | 18 |

## ALASKA NATIVE LANGUAGES PROGRAM

*College of Arts and Letters*

**Degree:** Bachelor of Arts*
**Minimum Requirements for Degree:**
130 Credits

There are nearly twenty different Alaska native languages: Aleut, Pacific Gulf Eskimo (also called Aleut), Central Yupik Eskimo, St. Lawrence Island Eskimo Inupiaq Eskimo, Tsimshian, Haida, Tlingit, Eyak, and about ten Athapaskan languages. These languages are becoming recognized as the priceless heritage they truly are. The passage of the Alaska bilingual education law in 1972 has created a great demand

for teachers who can speak and teach these languages in the schools throughout the State where there are native children. Professional opportunities for those skilled in these languages are many in teaching, research, and cultural, educational, and political development.

Central Yupik Eskimo is spoken by the largest number of people, and Inupiaq by the next largest. In these two languages major and minor curricula are now offered. For work in all other languages, individual or small-group instruction is offered under special topics. Thus there have frequently been instruction and seminars and workshops also in Tlingit, Haida, Athapaskan, St. Lawrence Island Eskimo and Aleut.

*Special arrangements may also be made for graduate work in Alaska Native Languages.

**Yupik Eskimo—B.A. Degree**

**1.** Complete general University requirements and B.A. degree requirements, pages 27-9.
**2.** Complete the following program (major) requirements:

| | *Credits* |
|---|---|
| Esk. 101-102—Elementary Yupik Eskimo | 10 |
| Esk. 201-202—Intermediate Yupik Eskimo | 8 |
| ANL 215—Eskimo-Aleut Languages | 3 |
| Esk. 415—Advanced Yupik Eskimo | 3 |
| Ling. 101—Nature of Language | 3 |
| Complete two of the following: | |
| Esk. 415—(Additional) Advanced Yupik Esk | 3 |
| ANL 387—Bilingual Methods & Materials | 3 |
| Ling. 212—Structure of Language | 3 |
| Anth. 342—Anthropology of the Natives of Alaska | 3 |
| Hist. 100—Heritage of Alaska Natives | 3 |
| P.S. 263—Alaska Native Politics | 3 |
| Engl. 349—Aleut, Eskimo, & Indian Literature of Alaska in English Translation | 3 |
| ANL 216—Indian Languages of Alaska | 3 |
| A course in Inupiaq Eskimo or other approved subject | 3 |

**Inupiaq Eskimo—B.A. Degree**

**1.** Complete the general University requirements and B.A. degree requirements, pages 27-9.
**2.** Complete the following program (major) requirements:

| | *Credits* |
|---|---|
| Esk. 111-112—Elementary Inupiaq Eskimo | 10 |
| ANL 215—Eskimo-Aleut Languages | 3 |
| Esk. 417—Advanced Inupiaq Eskimo | 3 |
| Ling. 101—The Nature of Language | 3 |
| Complete four of the following: | |
| Esk. 417—(additional) Adv. Inupiaq Eskimo | 3 |
| ANL 387—Biligual Methods & Materials | 3 |
| Ling. 212—Structure of Language | 3 |
| Anth. 342—Anthropology of the Natives of Alaska | 3 |
| Hist. 100—Heritage of Alaska Natives | 3 |
| P.S. 263—Alaska Native Politics | 3 |
| Engl. 349—Aleut, Eskimo, and Indian Literature of Alaska in English Translation | 3 |
| ANL 216—Indian Languages of Alaska | 3 |
| A course in Yupik Eskimo or other approved subject | 3 |

**A Minor in Alaska Native Languages requires 15 credits in Eskimo or Alaska Native Language courses.**

## ANTHROPOLOGY

*College of Behavioral Sciences and Education*

**Degrees:** Bachelor of Arts, Bachelor of Science, Master of Arts

**Minimum Requirements for Degrees:** B.A.—130 Credits; B.S.—130 Credits; M.A.—30 Additional Credits

The Anthropology Department offers a balanced and flexible program of academic courses and research opportunities in cultural anthropology, archaeology and physical anthropology, particularly with respect to the past and present cultures of the North. Anthropology contributes to an understanding of the complex problems of human behavior, cultural and social organization, and the relationship of man to the various environments. 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.

**Anthropology—B.S. or B.A. Degree**

**1.** Complete general University requirements and B.A. or B.S. degree requirements, pages 27-9.
**2.** Complete the following program (major) requirements:

| | *Credits* |
|---|---|
| Anth. 205—Physical Anthropology | 3 |
| Anth. 206—World Prehistory | 3 |
| Anth. 214—Archaeology | 3 |
| Anth. 410—History of Anthropology | 3 |
| Phil. 481—Philosophy of Science *or* Phil. 483—Philosophy of Social Science *or* Phil. 484—Philosophy of History | 3 |

Complete 24 credits according to the following arrangement:

A. Area Studies—Complete 12 credits, including at least 3 credits from each subdiscipline:

1. Archaeology
   - Anth. 312—North American Archaeology .....3
   - Anth. 328—Arctic Archaeology .....3
   - Anth. 330—Archaeology of Northern Asia .....3
   - Anth. 492—Seminars
   - Anth. 493—Special Topics
2. Cultural
   - Anth. 326—Arctic Ethnology .....3
   - Anth. 329—Peoples of the USSR .....3
   - Anth. 335—North American Ethnology .....3
   - Anth. 342—Anthropology of the Natives of Alaska .....3
   - Anth. 492—Seminars
   - Anth. 493—Special Topics
3. Physical
   - Anth. 333—Biology of Arctic Peoples .....3
   - Anth. 334—Physical Anthropology of the New World .....3
   - Anth. 492—Seminars
   - Anth. 493—Special Topics

B. Theory and Method—Complete 12 credits, including at least 3 credits from each subdiscipline:

1. Archaeology
   - Anth. 430—Anthropological Field Methods.....3
   - Geol. 304—Geomorphology .....3
   - Geol. 462—Glacial and Pleistocene Geology .....3
   - Anth. 492—Seminars
   - Anth. 493—Special Topics
2. Cultural
   - Anth. 423—Social Structure.....3
   - Anth. 424—Religion: An Anthropological Approach .....3
   - Anth. 427—Contemporary Problems .....3
   - Anth. 430—Anthropological Field Methods.....3
   - Anth. 492—Seminars
   - Anth. 493—Special Topics
3. Physical
   - Anth. 401—Primate and Human Evolution .....3
   - Anth. 403—Human Osteology.....3
   - Anth. 404—Human Variations.....3
   - Anth. 405—Anthropological Genetics .....3
   - Anth. 492—Seminars
   - Anth. 493—Special Topics

**A minor in Anthropology requires 12 hours in Anthropology in addition to Anth. 101.**

### Anthropology—M.A. Degree

The graduate program allows for some specialization within the general field of Anthropology. The program is to (1) prepare students for further advanced work and (2) prepare students to teach Anthropology at the undergraduate level in, for instance, community colleges. The basic philosophy is such that, although the students will have some specialization, they will at the same time have a broad grasp of Anthropology as a whole.

1. Complete the general University requirements and master's degree requirements, pages 27 and 29-30.
2. Complete 12 credits of graduate level courses in Anthropology, of which 3 credits must be Anth. 603, Proseminar in Anthropology, which will be limited to graduate students and must be taken in the second semester of graduate work.
3. Complete 12 credits of related subjects, of which at least 3 must be A.S. 301.
4. Complete the master's thesis, 6 credits, according to the following time schedule:

| | Fall Semester | Spring Semester |
|---|---|---|
| A. First draft to chairman of the committee | Oct. 15 | Mar. 1 |
| B. Second draft to committee at large | Nov. 15 | Apr. 1 |
| C. Defense (only after passing comprehensive examination) | Dec. 15 | May 1 |

**Language:** The need for a language or a suitable substitute shall be determined by the student and his advisory committee.

**Comprehensive Examination** should be taken during the fourth semester of full graduate status according to the following time schedule:

Fall Semester—first week of November
Spring Semester—first week of April

## APPLIED STATISTICS

*College of Mathematics, Physical Sciences, and Engineering*

The Applied Statistics Program is designed to strengthen and consolidate the applied statistics teaching and consulting functions. The program, a non-degree-granting one, is supervised by an interdisciplinary committee of selected staff members from the academic colleges and research institutes. The committee makes recommendations concerning the applied statistics course offerings, supervises the teaching program, provides a mechanism for statistical consulting services for other units of the University and serves as a focal point for applied statistics-related activities.

The applied statistics courses are taught by faculty members holding joint appointments in the Applied Statistics Program and other units of

the University. As demand and circumstances warrant, short courses or seminars covering specialized areas of applied statistics, for which the University has limited expertise, will be presented by experts from outside the University.

## ART

*College of Arts and Letters*

**Degree:** Bachelor of Arts
**Minimum Requirements for Degree:** 130 Credits

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

**Art—B.A. Degree**

1. Complete general University requirements and B.A. degree requirements, pages 27-9.
2. Complete the following program (major) requirements: (Complete a minimum of 37 hours of credit in Art.)

| | *Credits* |
|---|---|
| Art 105-106—Freehand Drawing | 4 |
| Art 207-208—Beginning Printmaking | 4 |
| Art 211-212—Beginning Sculpture | 6 |
| Art 213-214—Beginning Oil Painting | 6 |
| Art 261-262—History of World Art | 6 |
| Art 307—Intermediate Printmaking | 2 |
| Art 311—Intermediate Sculpture | 3 |
| Art 313—Intermediate Oil Painting | 2 |
| Art 407-408—Advanced Printmaking | 4 |
| *or* Art 411-412—Advanced Sculpture | 6 |
| *or* Art 413-414—Advanced Oil Painting | 4 |

A maximum of 54 hours of credit in art courses may be counted toward the degree.

Transfer students who are candidates for the B.A. degree with a major in Art must complete a minimum of 18 hours of credits in art courses while in residence.

**A Minor in Art requires 12 hours of approved Art courses.**

**Art Program for Teachers**

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

## ASIAN STUDIES

*Interdisciplinary Minor Program*

A minor in Asian Studies provides instruction in the varieties of Asian languages and cultures through an interdisciplinary approach, and enables students to consolidate various course offerings into a meaningful and cohesive program relevant to several major fields of specialization.

**Requirements for Asian Studies Minor**

Complete 15 semester credits in approved courses in Asian Studies, distributed among at least three departments, and including material on at least two Asian countries.

Asian Studies Courses: Anth. 330, Hist. 121-122, 330, 331, 481-482; Geog. 311; Jap. 101-102, 201-202; Phil. 202; P.S. 342.

## BIOLOGICAL SCIENCES

*College of Biological Sciences and Renewable Resources*

**Degrees:** Bachelor of Arts, Bachelor of Science, Master of Science, Master of Arts in Teaching, Doctor of Philosophy (Interdisciplinary)
**Minimum Requirements for Degrees:** B.A.—130 Credits; B.S.—130 Credits; M.S.—30 Additional Credits; M.A.T.—30 Additional Credits

The curricula in the Biological Sciences Department are designed to give the student a broad education as well as a sound foundation in the basic principles of biology. Students pursuing either a B.A. or B.S. degree may have majors in biological sciences. The B.A. degree includes fewer credits in the major field, but gives greater emphasis in the fields of social sciences and humanities and allows a greater breadth of subject matter in the curricula. The B.S. degree includes a foundation in the basic sciences as well as a stronger major within the Biological Sciences Department. Candidates who expect to teach in public secondary schools must be sure that education requirements are met.

**Biological Sciences—B.A. Degree**

1. Complete the general University requirements and B.A. degree requirements, pages 27-9.

2. Complete the following program (major) requirements:

Biol. 107-108, 210, 252-253, 271 and at least 16 additional credits in biology, a majority of which should be at the upper division level, including at least one course in botany, one in microbiology, and one in zoology.*

Chemistry — one year

Mathematics — one year

**A minor in Biological Sciences requires 20 credits in Biology, including Biol. 107-108, 252, and 271 and two of the following courses:**

**Biol. 201, 208, 210, 239, 242, 305.**

**Biological Sciences—B.S. Degree**

1. Complete the general University requirements and B.S. degree requirements, pages 27 and 29.

2. Complete the following program (major) requirements:

Biol. 107-108, 210, 252-253, 271 and at least 25 additional credits in biology, a majority of which should be at the upper division level, including at least one course in botany, one in microbiology, and one in zoology.*

Chem. 105-106

Organic Chemistry — one semester.

Complete 8 credits chosen from: Physics, Geology, Applied Statistics, Chemistry and/or Math.

Foreign Language—one collegiate year; or 6 credits of Social Sciences and/or Humanities beyond the general requirements for the B.S. degree.

*Students preparing to enter professional schools (medical, dental, veterinary, etc.) may substitute up to eight credits in the B.A. program or 12 credits in the B.S. program of approved chemistry courses for some of these additional credits.

**Students from Other Departments**

Candidates for the Bachelor of Science degree in General Science wishing a major in biological sciences must satisfy both the requirements of their major curriculum and those listed above for a B.A. degree with a major in Biological Sciences.

**Botany, Biology, or Zoology—M.S. Degree**

1. Complete the general University requirements and master's degree requirements, pages 27 and 29-30.

2. Complete a minimum of 30 credits of approved courses.

3. Students working in subject areas involving significant non-English literature may be expected to read the appropriate foreign language.

**M.A.T. Degree**

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

**Ph.D. Degree**

See page 30 for degree requirements.

## BUSINESS ADMINISTRATION

*College of Business, Economics, and Government*

**Degrees:** Associate in Arts in Business Administration, Bachelor of Business Administration, Master of Business Administration

**Minimum Requirements for Degrees:** A.A.—60 Credits; B.B.A.—130 Credits; M.B.A.—30 Additional Credits

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

**Business Administration—A.A. Degree**

1. Complete general University requirements as listed on page 27.

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

| | *Credits* |
|---|---|
| Written Communication | 6* |
| Sp.C. 111—Fund. of Oral Communication | 3 |
| Math. 55—Elementary Algebra *and* Math. 110—Math. of Finance | 6** |
| Econ. 51-52—Intro. to Economics I & II *or* Econ. 121-122—Principles of Econ. I & II | 6 |
| Acc. 51-52—Intro. to Accounting I & II *or* Acc. 101-102—Elementary Accounting | 6 |
| Hist. 132—History of the U.S. | 3 |
| B.A. 230—Business in American History | 3 |
| P.S. 101—Intro. to American Government | 3 |
| B.A. 151—Intro. to Business | 3 |
| B.A. 243—Principles of Marketing | 3 |
| B.A. 280—Principles of Management | 3 |
| B.A. 331-332—Business Law | 6 |
| Electives in Business, Economics or Acc. (3 credits may be Business Practicum) | 9 |

*At direction of advisor.

**Math 55 may be waived by examination, 3 credits of mathematics elective will then be required.

**Business Administration—B.B.A. Degree**

1. Complete general University requirements and B.B.A. degree requirements, pages 27 and 29.

2. Complete the following program (major) requirements:

| | *Credits* |
|---|---|
| B.A. 331-332—Business Law | 6 |
| B.A. 325—Financial Management | 3 |

B.A. 243—Principles of Marketing.....3
B.A. 280—Principles of Management.....3
B.A. 360—Production Management.....3
B.A. 361—Industrial Relations.....3
B.A. 371—Business Data Processing.....3
B.A. 462—Administrative Policy.....3
Econ. 321—Intermediate Microeconomics.....3
Econ. 326—Statistical Methods.....3

Complete a minimum of 18 hours of the courses listed below including all of the courses in one of the three groups.

*Credits*

**Management:**
Econ. 324—Intermediate Macroeconomics.....3
B.A. 359—Regulation of Industry.....3
Econ. 409—Industrial Organ. & Public Policy.....3
Econ. 420—Labor Economics.....3
Econ. 424—Managerial Economics.....3
Econ. 480—Organization Theory.....3

**Marketing:**
B.A. 328—Principles of Advertising.....3
Econ. 409—Industrial Organ. & Public Policy.....3
B.A. 443—Marketing Analysis of Retailing Management.....3
B.A. 444—Industrial Marketing.....3
B.A. 445—Marketing Research.....3
B.A. 475—Transportation and Logistics.....3

**Finance:**
Acc. 311-312—Intermediate Accounting.....6
Econ. 324—Intermediate Macroeconomics.....3
Econ. 409—Industrial Organ. & Public Policy.....3

A student emphasizing Finance must take the above four courses plus two of the following electives:
B.A. 423—Investment Management.....3
B.A. 425—Adv. Corporate Financial Problems.....3
Econ. 350—Money and Banking.....3
Econ. 351—Public Finance.....3
Acc. 310—Income Tax.....3
Acc. 342—Managerial Cost Accounting.....3

**A minor in Business Administration requires 15 credits of Business Administration courses as directed by Department.**

### Business Administration—M.B.A. Degree

**1.** Complete the general University requirements and master's degree requirements, pages 27 and 29-30. (Note that no foreign language requirement is involved in the Master of Business Administration degree.)
**2.** Complete a minimum of 30 semester hours of required courses in business administration and economics, including a thesis or research project, as approved by the candidate's graduate committee.
**3.** Complete a thesis or research project, which normally will carry no more than six semester hours of credit. Under unusual conditions and upon petition, thesis credit may be granted beyond the traditional six. Thesis credit and research project credit apply toward the 30 required hours. (Decisions on thesis or research project are the sole prerogative of the candidate's supervisory committee.)
**4.** Earn a minimum terminal grade point average of 3.00.
**5.** Earn a minimum grade for a comprehensive written examination given during the last semester of course work to test achievement and knowledge in the general area of business.
**6.** Pass an oral examination, after the thesis or research project has been approved, covering the student's field of specialization and thesis or research project content.

## CHEMICAL ENGINEERING

*College of Mathematics, Physical Sciences, and Engineering*

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

The University does not offer a full four-year curriculum in chemical engineering but hopes to do so in the future. The first two years of the curriculum for the B.S. degree with a major in chemistry will, in general, prepare a student to transfer into chemical engineering at other institutions. However, it would be wise for students to consult the catalogs of institutions to which they might transfer and plan their two years at the University of Alaska to conform to their requirements.

## CHEMICAL SCIENCE

*College of Mathematics, Physical Sciences, and Engineering*

**Degree:** Associate in Chemical Science
**Minimum Requirements for Degree:** 60 Credits

Since the fall semester of 1971, the Department of Chemistry and Chemical Engineering has offered a two year program leading to an A.C.S. degree. This degree provides academic recognition of a level of competence in chemical science required for a number of employment opportunities. In addition, the student completing this program should be in a position to continue his education toward a baccalaureate degree in either chemistry or chemical engineering with no loss in time or academic credit.

**Chemical Science—A.C.S. Degree**
1. Complete the general University requirements as listed on page 27.
2. Complete the following degree and program (major) requirements:

| | *Credits* |
|---|---|
| Chem. 105-106—General Chemistry | 8 |
| Chem. 211—Chemical Principles | 4 |
| Chem. 212—Intro. Quant. Analysis | 4 |
| Chem. 321-322—Organic Chemistry | 6 |
| Chem. 324—Organic Laboratory | 3 |
| Math. 200-201-202 | 12 |
| Phys. 105-106—University Physics | 8 |
| E.S. 101—Graphics | 2 |
| E.S. 201—Computer Technology | 3 |
| Engl. 111—Methods of Written Comm. | 3 |
| Speech Communications elective | 3 |
| Electives to bring total credits to | 60 |

## CHEMISTRY

*College of Mathematics, Physical Sciences, and Engineering*

**Degrees:** Bachelor of Arts, Bachelor of Science, Master of Arts, Master of Arts in Teaching, Master of Science, Doctor of Philosophy (Interdisciplinary)
**Minimum Requirements for Degrees:** B.A., B.S.—130 Credits; M.A., M.A.T., M.S.—30 Additional Credits; Ph.D. (Interdisciplinary) — No Fixed Credits

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

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

The primary purpose of our program is to provide the educational basis for creative scientists or engineers who are so vital to the future development of the nation and the State of Alaska. In particular, the Chemistry Department encourages study of chemical problems associated with the Arctic in order to provide qualified staff for schools and laboratories in Alaska. After the introductory courses, the curriculum is planned first for the student majoring in the broad field of chemistry and, second, for the non-major who is primarily interested in other aspects of the physical or biological sciences, but who requires competency in the theories and techniques of contemporary chemistry to achieve in his chosen field. Such service courses and programs are an outstanding feature of the department.

The department offers the student well-equipped laboratories housing instrumentation for nuclear magnetic resonance and electron spin resonance spectrometry, high resolution infrared, laser Raman, ultraviolet, and visible spectrophotometry, gas chromatography, x-ray diffraction, and carbon-hydrogen-nitrogen analysis. Additional equipment, such as mass spectrometers, amino acid analyzers, and atomic absorption instruments, is available in cooperation with other departments and institutes at the University.

**Chemistry—B.A. Degree**

1. Complete the general University requirements and B.A. degree requirements, pages 27-9.
2. Complete the following program (major) requirements:

| | *Credits* |
|---|---|
| Chem. 105-106—General Chemistry | 8 |
| *or* Chem. 211—Chemical Principles | 4 |
| Chem. 212—Intro. Quantitative Analysis | 4 |
| Chem. 321-322—Organic Chemistry | 6 |
| Chem. 324—Organic Laboratory | 3 |
| Chem. 331-332—Physical Chemistry | 6 |
| Chem. 433-434—Instrumental Methods in Chem. | 6 |
| Chem. 492—Seminar (Seniors) | 2 |
| Math. 200-201-202—Calculus | 12 |
| Phys. 105-106—University Physics | 8 |

**Chemistry—B.S. Degree**

1. Complete the general University requirements and B.S. degree requirements, pages 27 and 29.
2. Complete the following program (major) requirements:

Complete the courses required for a B.A. degree with a major in Chemistry as listed above. Complete the following additional Chemistry courses:

| | *Credits* |
|---|---|
| Chem. 402—Inorganic Chemistry | 3 |
| **Chem. 421—Adv. Organic Chemistry | |
| *or* **Chem. 425—Adv. Organic Laboratory | |
| *or* **Chem. 431—Adv. Physical Chemistry | |
| *or* **Chem. 451—General Biochemistry | 3-4 |
| Chem. 492—Seminar (Juniors) | 0 |
| **Chem. 498—Research | 4 |

**Suggested Curriculum for a B.S. Degree**

**First Year**

| *Fall Semester* | *15 to 18 Credits* |
|---|---|
| Chem. 105—General Chemistry | |
| *or* Chem. 211—Chemical Principles | 4 |
| Phys. 105—University Physics | 4 |
| Math. 200—Calculus | 4 |
| Engl. 111—Methods of Written Comm. | 3 |
| *Social Sci./Humanities elective | 0-3 |

| *Spring Semester* | *15 to 18 Credits* |
|---|---|
| Chem. 106—General Chemistry | |
| *or* Chem. 212—Intro. Quantitative Analysis | 4 |
| Phys. 106—University Physics | 4 |
| Math. 201—Calculus | 4 |
| Sp.C. 111—Fund. of Oral Communication | 3 |
| *Social Sci./Humanities elective | 0-3 |

**Second Year**

| *Fall Semester* | *16 or 17 Credits* |
|---|---|
| Chem. 212—Intro. Quantitative Analysis | |
| *or* *Elective | 4 |
| Chem. 321—Organic Chemistry | 3 |
| Math. 202—Math. 202—Calculus | 4 |
| Engl. 211—Intermediate Expos. & Modes of Lit. | |
| *or* Engl. 213—Intermediate Exposition | 3 |
| *Social Sci./Humanities elective | 2-3 |

| *Spring Semester* | *16 or 17 Credits* |
|---|---|
| Chem. 322—Organic Chemistry | 3 |
| Chem. 324—Organic Laboratory | 3 |
| E.S. 201—Computer Techniques | 3 |
| *Social Sci./Humanities electives | 7-8 |

**Third Year**

| *Fall Semester* | *16 or 17 Credits* |
|---|---|
| Chem. 331—Physical Chemistry | 3 |
| Chem. 433—Instrumental Methods in Chemistry | 3 |
| Chem. 492—Seminar | 0 |
| Ger. 111—German for Reading Ability | |
| *or* Russ. 111—Russian for Reading Ability | 3 |
| *Electives | 7 or 8 |

| *Spring Semester* | *15 or 16 Credits* |
|---|---|
| Chem. 332—Physical Chemistry | 3 |
| Chem. 434—Instrumental Methods in Chemistry | 3 |
| Chem. 492—Seminar | 0 |
| Ger. 112—German for Reading Ability | |
| *or* Russ. 112—Russian for Reading Ability | 3 |
| *Electives | 7 or 8 |

**Fourth Year**

| *Fall Semester* | *16 or 18 Credits* |
|---|---|
| **Chem. 421—Adv. Organic Chemistry | |
| *or* **Chem. 425—Adv. Organic Lab | |
| *or* **Chem. 431—Adv. Physical Chem. | |
| *or* **Chem. 451—General Biochemistry | 3-4 |
| Chem. 492—Seminar | 1 |
| **Chem. 498—Research | 2 |
| *Electives | 7-10 |

| *Spring Semester* | *16 or 18 Credits* |
|---|---|
| Chem. 402—Inorganic Chemistry | 3 |
| Chem. 492—Seminar | 1 |
| **Chem. 498—Research | 2 |
| *Electives | 10-12 |

*A minimum of 130 credits must be earned. This curriculum meets the suggested minimum standards of the American Chemical Society, but additional advanced courses in chemistry may be elected with the approval of the Department of Chemistry. Graduates are certified by the American Chemical Society on completion of appropriate courses. A reading knowledge of a foreign language, although not required for professional undergraduate education in chemistry, is strongly recommended, particularly for students planning advanced study in science. German is especially useful.

**Advanced courses in mathematics, geology, physics, or biological sciences may be substituted with the approval of the Department of Chemistry.

**Requirements for a Minor in Chemistry**

A minor in chemistry requires 12 credits above the foundation courses (Chem. 105-106 or Chem. 211) approved by the head of the chemistry department.

**Chemistry—M.A. or M.S. Degree**
1. Complete the general University requirements and master's degree requirements, pages 27 and 29-30.
2. Complete a minimum of 30 credits of approved courses.

Graduate students seeking a master's degree with a major in chemistry must develop a program in one of the general division of chemistry; analytical, biochemistry, inorganic, organic or physical. A student entering without preparation to take these courses may require additional time to earn his degree.

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

**Ph.D. Degree**
Complete the requirements for the doctoral degree, pages 27 and 30. Persons interested in this degree program should write to the Provost, outlining in some detail previous training and interest for future study.

## CIVIL ENGINEERING

*College of Mathematics, Physical Sciences and Engineering*

**Degrees:** Bachelor of Science, Master of Civil Engineering, Master of Science
**Minimum Requirements for Degrees:** B.S.—130 Credits; M.C.E. or M.S.—30 Additional Credits

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

Candidates for the Bachelor of Science degree will be required to take a comprehensive examination in their general field. (Completion of the State of Alaska Engineering-In-Training Examination will satisfy this requirement.)

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

In addition to the general civil engineering courses offered, the following specialties are available:

**Arctic Engineering.** The department administers an interdisciplinary specialty in Arctic Engineering, designed to equip graduates with the knowledge applicable to engineering practice in cold regions. The program includes the problems of design, construction, and maintenance of engineered facilities, services, and transportation in an arctic and subarctic environment.

**Water Resources and Hydrology.** The Master's degree programs can emphasize a flexible program in water resources and hydrology tailored to individual students. The courses within the department in these areas stress the problems of northern regions and emphasize principles of analysis, planning, and engineering design as related to water supply, flood control, environmental safety, and land management.

In addition to the Civil Engineering courses, a degree program can include courses in ocean engineering, environmental health engineering, engineering management, arctic geography, and other areas.

**Civil Engineering—B.S. Degree**
1. Complete general University requirements as listed on page 27.
2. Complete the following degree and program (major) requirements:

**First Year**

| *Fall Semester* | *16 Credits* |
|---|---|
| Engl. 111—Methods of Written Communication | 3 |
| Math. 200—Calculus | 4 |
| E.S. 101—Graphics | 2 |
| E.S. 111—Engineering Science | 3 |
| Chemistry (Approved) | 4 |

| *Spring Semester* | *16 Credits* |
|---|---|
| Speech Communications elective | 3 |
| Math. 201—Calculus | 4 |
| E.S. 102—Graphics | 2 |
| C.E. 112—Elementary Surveying | 3 |
| Chemistry (Approved) | 4 |

**Second Year**

| *Fall Semester* | *17 Credits* |
|---|---|
| Math. 202—Calculus | 4 |
| Phys. 105—University Physics | 4 |
| E.S. 201—Computer Techniques | 3 |
| Engl. 211—Intermediate Exposition and Modes of Literature | |
| *or* Engl. 213—Intermediate Exposition | 3 |
| Social Science/Humanities Elective | 3 |

| *Spring Semester* | *17 Credits* |
|---|---|
| Math. 302—Differential Equations | 3 |
| Phys. 106—University Physics | 4 |
| E.S. 208—Mechanics | 4 |
| C.E. 334—Prop. of Material | 3 |
| Social Science/Humanities Elective | 3 |

**Third Year**

| *Fall Semester* | *17 Credits* |
|---|---|
| E.S. 301—Engr. Analysis | 3 |
| E.S. 307—Elem. of Electr. Engr. | 4 |
| E.S. 331—Mech. of Materials | 3 |
| E.S. 341—Fluid Mechanics | 4 |
| Social Science/Humanities elective | 3 |

| *Spring Semester* | *16 Credits* |
|---|---|
| E.S. 346—Basic Thermodynamics | 3 |
| E.S. 308—Instrumentation & Measurement | 3 |
| C.E. 441—Sanitary Engineering | 4 |
| C.E. 344—Water Res. Engineering | 3 |
| Geol. 281—Geology for Engineers | 3 |

**Fourth Year**

| *Fall Semester* | *16 Credits* |
|---|---|
| C.E. 435—Soil Mechanics | 3 |
| C.E. 431—Structural Analysis | 4 |
| C.E. 415—Surveying | 3 |
| Social Science/Humanities Elective | 6 |

| *Spring Semester* | *15 Credits* |
|---|---|
| E.M. 450—Economic Analysis and Operations | 3 |
| C.E. 402—Transportation Engineering | 2 |
| C.E. 422—Foundation Engineering | 2 |
| C.E. 432—Structural Design | 4 |
| Elective | 4 |

**Civil Engineering—M.C.E. Degree**

Students entering the Master of Civil Engineering program should have completed a bachelor's degree in engineering.

A student will elect a Civil Engineering program approved by his graduate committee and must complete the general University requirements and master's degree requirements, pages 27 and 29-30. Thirty semester 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.

**Civil Engineering—M.S. Degree**

A student selecting this program will meet the general University requirements and master's degree requirements, pages 27 and 29-30, plus the following: Thirty semester hours of credit approved by his graduate committee, of which six to twelve hours will be C.E. 699.

## COMPUTER INFORMATION SYSTEMS

*College of Business, Economics, and Government*

**Degree:** Associate in Computer Information Systems

**Minimum Requirements for Degree:** 63 Credits

**Computer Information Systems—A.C.I.S. Degree**

**1.** Complete general University requirements as listed on page 27.

**2.** Complete the following degree and program (major) requirements:

| | *Credits* |
|---|---|
| English | 6 |
| Political Science or American History (in sequence) | 6 |
| Speech | 3 |
| *Mathematics:* | |
| Math. 107—College Algebra | 3 |
| Math. 108—Trigonometry | 2 |
| Math. 110—Mathematics of Finance | 3 |
| Econ. 221—Intro. to Statistics for Economics & Business | 3 |
| *Other:* | |
| Acc. 101—Elementary Accounting | 3 |
| Acc. 102—Elementary Accounting | 3 |
| CIS 101—Intro. to Data Processing and Fortran | 3 |
| B.A. 371—Business Data Processing | 4 |
| CIS 104—Operations Management | 3 |
| CIS 201—COBOL | 3 |
| CIS 202—Principles of Programming with Business Applications | 3 |
| CIS 210—Systems Design and Analysis | 4 |
| B.A. 253—Business Practicum | 1 |
| B.A. 372—Adv. Fortran Programming | 3 |
| Elective | 2 |
| *Any two of the following courses:* | |
| B.A. 151—Introduction to Business | 3 |
| CIS 103—Techniques of Organization | 3 |
| CIS 209—Introduction to Operating Systems | 3 |
| CIS 220—Basic Programming Languages | 3 |

M.S.

## CONSTRUCTION TECHNOLOGY

*College of Mathematics, Physical Sciences and Engineering*

**Degree:** Associate in Applied Science
**Minimum Requirements for Degree:** 60 Credits.

**Construction Technology—A.A.S. Degree**

**1.** Complete general University requirements as listed on page 27.

**2.** Complete the following degree and program (major) requirements:

| First Semester | *15 Credits* |
|---|---|
| C.T. 101—Constr. Drafting (Basic) | 3 |
| C.T. 111—Basic Surveying Skills* | 3 |
| C.T. 112—Surveying Computations* | 3 |
| C.T. 121—Construction Mathematics | 3 |
| Engl. 111—Methods of Written Comm. | 3 |

| Second Semester | *16 Credits* |
|---|---|
| C.T. 102—Constr. Drafting (Basic) | 2 |
| C.T. 113—Earthwork* | 3 |
| C.T. 114—Basic Construction Surveys* | 3 |
| Math. 107—College Algebra | 3 |
| C.T. 131—Intro. to Computer Programming | 2 |
| Sp.C. 111—Speech Communication | 3 |

| Third Semester | *18 Credits* |
|---|---|
| Engl. 213—Intermediate Exposition | 3 |
| C.T. 201—Constr. Drafting (Structural) | 2 |
| C.T. 211—Topographic and Control Surveys | 2 |
| C.T. 241—Constr. Materials Tech. | 3 |
| C.T. 251—Constr. Economics | 2 |
| E.S. 111—Engineering Science | 3 |
| Math. 109—Analytic Geometry | 3 |

| Fourth Semester | *18 Credits* |
|---|---|
| C.T. 202—Constr. Drafting (Arch. & Mech.) | 2 |
| Math. 200—Calculus** | 4 |
| C.T. 242—Soil Properties and Testing | 3 |
| C.T. 252—Construction Estimates | 2 |
| C.T. 253—Contracts and Business Law | 2 |
| C.T. 261—Statics & Strength of Materials | 3 |
| C.T. 271—Accounting for Construction | 2 |

*for 1/2 semester
**special section

## DENTISTRY

*See Health Sciences, Preprofessional Curricula.*

## EARTH SCIENCE

*College of Earth Sciences & Mineral Industry*

**Degree:** Bachelor of Arts
**Minimum Requirements for Degree:** 130 Credits

**Earth Science—B.A. Degree**

**1.** Complete the general University requirements and B.A. degree requirements, pages 27-9.

**2.** Complete the following requirements:

A. Complete one year college-level mathematics; Math. 103-104 recommended.

B. Complete one semester of college chemistry (Chem. 103 recommended) *or* one semester of college physics (Phys. 103 recommended).

**3.** Complete 18 credits in Earth Science, including Geol. 101 (111), 102 (102), Geog. 105 or 401, Geog. 316 or 408, Pet. 101, and Min. 101 or 102.

**4.** Major Electives:
Complete an additional 10 credits of 300-level or above Earth Science courses including one credit of Geol. 492, or Geog. 492, or Min. 320.

**5.** Major-Related Electives:
Complete an additional 12 credits of the following or approved alternative courses: (can also be used to meet basic degree requirements and to apply toward minor requirements)

Agriculture 491, 492
Biology 104, 107-108, 271
Computer Info. Systems 101
Land Resources 102-103, 311, 321, 354, 451

**6.** Approved electives, including minor requirements, to complete 130 credits.

**Suggested Curriculum**

**First Year**

| *Fall Semester* | *15 to 17 Credits* |
|---|---|
| Chem. 103—Contemporary Chemistry *or* Phys. 103—College Physics | 4 |
| Engl. 111—Methods of Written Comm | 3 |
| Geol. 101—General Geology | 3 |
| *or* Geol. 111—Physical Geology | 4 |
| Electives | 5-6 |

| *Spring Semester* | *15 to 16 Credits* |
|---|---|
| Arts-Letters/Hist. Elective | 3 |
| Geog. 105—Elements of Phys. Geog. | 3-4 |
| Geol. 102—Historical Geology | 3 |
| Electives | 6 |

**Second Year**

| *Fall Semester* | *15 Credits* |
|---|---|
| Engl. 211—Intermed. Exposition with Modes of Literature | 3 |
| *or* Engl. 213—Intermediate Exposition | 3 |
| Math. 103—Concepts of Math. | 3 |
| Min. 101—Minerals & Man *or* Pet. 101—Intro. to Pet. Ind. | 3 |

Sp.C. 111—Fund. of Oral Comm .....3
Electives .....3

*Spring Semester* *15 to 17 Credits*
Arts-Letters/Hist. elective .....3
Math. 104—Concepts of Math .....3
Min. 102—Mining Engr. Systems
*or* Pet. 101—Intro. to Pet. Ind .....3
Major-related elective .....3
Electives .....3-5

**Third Year**
*Fall Semester* *17 Credits*
Geog. 316—Pleistocene Environment
*or* Geog. 408—Quant. Res. Techniques .....3
Major elective .....3
Major-related elective .....3
Arts-Letters/Hist. elective .....3
Other electives .....5

*Spring Semester* *17 Credits*
Major elective .....3
Major-related elective .....3
Arts-Letters/Hist. elective .....3
Other electives .....8

**Fourth Year**
*Fall Semester* *17 Credits*
Major elective .....3
Major-related elective .....3
Arts-Letters/Hist. elective .....3
Other electives .....8

*Spring Semester* *17 Credits*
Geol. 492—Seminar
*or* Geog. 492—Seminar
*or* Min. 320—Seminar/Senior Field Trip .....1
Geog. 401—Weather & Climate .....3
(in lieu of Geog. 105)
Major-related elective .....3
Other electives .....7

## ECONOMICS

*College of Business, Economics, and Government*

**Degrees:** Bachelor of Arts, Bachelor of Science
**Minimum Requirements for Degrees:**
B.A.—130 Credits; B.S.—130 Credits.

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

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

### Economics—B.A. Degree

1. Complete general University requirements and B.A. degree requirements, pages 27-9.
2. Complete the following program (major) requirements:

Acc. 101—Elementary Accounting .....3
Econ. 121-122—Principles of Economics .....6
Math. 161—Calculus for Business and Economics .....4
P.S. 101—American Government and Politics .....3
Complete 27 additional credits in Economics, including:
Econ. 221—Intro. to Statistics for Economics and Business .....3
Econ. 321—Intermediate Microeconomic Theory .....3
Econ. 472—Intermed. Macroecon. Theory .....3
Econ. 472—Seminar in Contemporary Economic Problems .....3
Electives in Economics .....15
(Must be 200-level or higher and 6 hours of the following courses may be included: B.A. 243, 325, 359, 371, 372, 423, 425, 480, Geog. 103, Math. 162).

### Economics—B.S. Degree

1. Complete the general University requirements and B.S. degree requirements, pages 27 and 29.
2. Complete the following program (major) requirements:

Econ. 121-122—Principles of Economics .....6
Math. 161-162—Calculus for Business and Economics .....8
Acc. 101—Elementary Accounting .....3
P.S. 101-102—American Government .....6
Complete 30 additional credits in Economics, including:
Econ. 221—Intro. to Statistics for Econ. & Bus. ...3
Econ. 321—Intermediate Microeconomics .....3
Econ. 324—Intermediate Macroeconomics .....3
Econ. 326—Statistical Methods .....3

Econ. 425—History of Economic Thought.....3
Econ. 472—Seminar in Contemporary Economic Problems.....3
Electives in Economics (200-level or higher).....12
(Six hours of the following courses may be included: B.A. 243, 325, 359, 371, 372, 423, 425, 480, and Geog. 103.)

**A Minor in Economics requires 15 credits in Economics including Econ. 121 and 122.**

## EDUCATION

*College of Behavioral Sciences and Education*

**Degrees:** Bachelor of Education, Master of Education, Master of Arts in Teaching, Educational Specialist

**Minimum Requirements for Degrees:** B.Ed.—130 Credits; M.Ed.—30-36 Additional Credits; M.A.T.—30 Additional Credits; Ed.S.—60 Additional Credits.

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

**Alaska Rural Teacher Training Corps** — In addition to the on-campus program for teacher preparation, the University of Alaska, in consortium with Alaska Methodist University and the Alaska State Operated Schools system, is conducting a four-year experimental field-based teacher training program in eleven rural Alaskan communities. The program is designed to explore the viability of field-based training, with particular focus on a cross-cultural environment. Applications for the program may be obtained through the Department of Education on campus, or by writing directly to Alaska State Operated Schools, 650 International Airport Road, Anchorage, Alaska 99502.

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

**Admission to Teacher Education** — Any student wishing to prepare for teaching through the University of Alaska must formally apply for admission to the Teacher Education Program. Students should consult with the head of the Education Department at the beginning of their sophomore year or while enrolled in Ed. 201 to initiate procedures for formal application for admission to the Teacher Education Program. Enrollment in education courses in no way implies admission to the Teacher Education Program.

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**Early Childhood Education—B.Ed. Degree**

**1.** Complete general University requirements as listed on page 27.

**2.** Complete the following degree and program (major) requirements:

| | *Credits* |
|---|---|
| A. Humanities (Art, English, Languages, Linguistics, Music, Philosophy, Speech) | 20 |
| 1. Required Courses: | |
| Engl. 111—Methods of Written Comm. | 3 |
| Engl. 211—Intermediate Exposition with Modes of Literature | |
| *or* Engl. 213—Intermediate Exposition | 3 |
| Sp.C. 111—Fundamentals of Oral Comm | 3 |
| 2. Recommended Courses: | |
| Art 161—Design and Color Theory | 3 |
| Art 162—Design and Color Theory | 3 |
| Mus. 161—Private Lessons (voice or piano) | 2 |
| Mus. 309—Elementary School Music Meth. | 3 |
| B. Social Sciences (Anthropology, Economics, Geography, History, H.E. 236, Political Science, Psychology, Sociology) | 27 |
| 1. Required Courses: | |
| B.S. 220—Culture and Learning | |
| *or* Soc. 345—Sociology of Education | 3 |
| H.E. 236—Marriage and Family Life | |
| *or* Soc. 242—The Family | 3 |
| Hist. 101-102—Western Civilization | |
| *or* Hist. 131-132—History of the U.S. | 6 |

Omit Area of Concentration and last 4 Courses

P.S. Elective.....3
Psy. 101—Introduction to Psychology.....3
Psy. 244—Early Childhood Development
*or* Psy. 245—Child Development.....3
Soc. 101—Introduction to Sociology.....3
2. Electives.....3

C. Natural Science and Mathematics (Anth. 401, Biological Sciences, Chemistry, Geog. 105-401, Geology, Physics).....9-11
Required Courses:
Mathematics.....3

D. Home Economics.....15
Required Courses:
H.E. 105—Survey of Child Dev. Models.....3
H.E. 120—Nutrition and Health.....3
H.E. 155—Acting for Young Children.....3
H.E. 250—Practicum in Early Childhood Dev...3
H.E. 251—Practicum in Early Childhood Dev...3

E. Education (students must maintain a 2.00 in each required education course and an overall g.p.a. of 2.00).....34
1. Required Courses:
Ed. 303—Language Development.....3
Ed. 304—Literature for Children.....3
Ed. 313—Educational Psychology.....3
Ed. 314—Practicum in Tutoring: Behavior Modification.....1
Ed. 331—Evaluative Procedures for Early Childhood Education.....1
Ed. 410—Reading and Young Children.....3
Ed. 452—Student Teaching (grades K-2).....9
2. Minimum of 6 credits from the following courses:
Ed. 315—Elementary Methods I.....3
Ed. 316—Elementary Methods II.....3
Ed. 317—Elementary Methods III.....3
Ed. 308—Physical Education for the Elementary School.....3
Ed. 311—Audio-Visual Methods & Materials.....3
3. Electives.....5

F. Free Electives (at least 12 credits in upper division courses).....23-25

G. Forty-eight credits of upper division courses, 24 of which must be completed at the University of Alaska.

H. Sufficient free electives to total 130 credits.

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**Elementary Teacher Credential Endorsement for Candidates for the B.Ed. Degree with a Major in Early Childhood Education:**

1. Complete the following required courses:
Ed. 315—Elementary Methods I.....3
Ed. 316—Elementary Methods II.....3
Ed. 317—Elementary Methods III.....3
Ed. 332—Tests and Measurements.....3
Ed. 409—The Teaching of Reading.....3
*Ed. 452—Student Teaching (Elementary).....9
2. Mathematics*.....3

*Appropriate credits earned in the fulfillment of the requirements for the B.Ed. with a major in Early Childhood Education may be applied toward the above requirements.

V. H.

**Elementary Education—B.Ed. Degree**

1. Complete general University requirements as listed on page 27.

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

*Credits*

A. Humanities (Art, English, Languages, Linguistics, Music Philosophy, Speech.....20
1. Required courses:
Engl. 111—Methods of Written Comm.....3
Engl. 211—Intermed. Exposition with Modes of Literature
*or* Engl. 213—Intermediate Exposition.....3
Phil. 201—Introduction to Philosophy.....3
Sp.C. 111—Fundamentals of Oral Comm.....3
2. Recommended courses:
Engl. 213—Intermediate Exposition.....3
Mus. 309—Elementary School Music Meth.....3
Sp.C. 241—Public Speaking I.....3
*or* Sp.C. 211—Voice and Diction.....2
Engl. 318—Modern Grammar.....3

B. Social Sciences (Anthropology, Economics, Geography, History, H.E. 236, Political Science, Psychology, Sociology).....21
1. Required courses:
Hist. 101-102—Western Civilization
*or* Hist. 131-132—History of the U.S.....6
P.S. Elective.....3
Psy. 101—Introduction to Psychology.....3
Psy. 245—Child Development.....3
2. Recommended courses:
Econ. 121-122—Principles of Economics.....6
Anth. 101—The Study of Man.....3
Anth. 342—Anthropology of the Natives of Alaska.....3
Geog. 101—Introductory Geography.....3
Hist. 341—History of Alaska.....3
Soc. 101-102—Introduction to Sociology.....6

C. Mathematics.....6
(Students are advised to take Math. 105 and 205 or Math. 345).

D. Natural Sciences (Anth. 401, Biological Sciences, Chemistry, Geog. 105-401, Geology, Physics).....6

E. Education (students must maintain a 2.00 grade point average in each required Education course and an overall GPA of 2.00).....37
1. Required courses:
Ed. 201—Orientation to Education.....3
Ed. 313—Educational Psychology.....3
Ed. 314—Practicum in Tutoring: Behavior Modification.....1
Ed. 315—Elementary Methods I.....3
Ed. 316—Elementary Methods II.....3
Ed. 317—Elementary Methods III.....3

Ed. 332—Tests and Measurements .....3
Ed. 409—The Teaching of Reading.....3
*Ed. 452—Student Teaching.....9

*Candidates who have taught successfully two years in the public elementary schools may petition to be excused from Ed. 452.

2. Six credits from the following courses:
Ed. 345—Sociology of Education .....3
Ed. 348—History of Education .....3
Ed. 422—Philosophy of Education .....3
Ed. 426—Principles and Practices of Guidance.....3
Ed. 446—Public School Organization, Control and Support .....3
Ed. 480—Education of Culturally Different Youth.....3

F. A total of 36 credits (including 12 upper division credits) in any two of the following fields, with a minimum of 12 credits in either field:

| | |
|---|---|
| Alaska Native Languages | Linguistics |
| Anthropology | Mathematics |
| Art | Music |
| Biological Sciences | Philosophy |
| Chemistry | Physical Education |
| Economics | Physics |
| English | Political Science |
| Eskimo | Psychology |
| French | Russian |
| Geography | Spanish |
| Geology | Speech |
| German | Sociology |
| History | |

Credits earned in fulfillment of (A), (B), (C), and (D) above may be applied toward courses listed in (F) above.

G. Forty-eight credits of upper-division courses, 24 of which must be completed at the University of Alaska.
H. Sufficient free electives to total 130 credits.

**Minor in Elementary Education and Minimum* Requirements for Elementary Teacher Credential Endorsement**

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Complete the following required courses: *Credits*
Ed. 313—Educational Psychology .....3
Ed. 314—Practicum in Tutoring: Behavior Modification .....1
Ed. 315—Elementary Methods I .....3
Ed. 316—Elementary Methods II.....3
Ed. 317—Elementary Methods III.....3
Ed. 332—Tests and Measurements.....3
Ed. 409—Teaching of Reading.....3
Ed. 452—Student Teaching .....9
Total Credits 25

OK

Students must also meet requirements for admission to Ed. 452, Student Teaching, which are: Psy. 101, Psy. 245, and six semester hours of mathematics.

*See Advisor or Advisory Committee.

V.H.

**Secondary Education—B.Ed. Degree**

1. Complete general University requirements as listed on page 27.
2. Complete the following degree and program (major) requirements:

A. Humanities (Art, English, Languages, Linguistics, Music, Philosophy, Speech) .....20
1. Required courses:
Engl. 111—Methods of Written Comm.....3
Engl. 211—Intermed. Exposition with Modes of Literature
*or* Engl. 213—Intermediate Exposition.....3
Phil. 201—Introduction to Philosophy .....3
Sp.C. 111—Fund. of Oral Comm. .....3
2. Recommended courses:
Engl. 213—Intermediate Exposition .....3
Sp.C. 241—Public Speaking I (3)
*or* Sp.C. 211—Voice and Diction (2) .....2 or 3

B. Social Sciences (Anthropology, Economics, Geography, History, H.E. 236, Political Science, Psychology, Sociology) .....21
1. Required courses:
Hist. 101-102—Western Civilization
*or* Hist. 131-132—History of the U.S. .....6
P.S. Elective.....3
Psy. 101—Introduction to Psychology .....3
Psy. 246—Adolescence .....3
2. Recommended courses:
Anth. 101—The Study of Man .....3
Anth. 342—Anthropology of the Natives of Alaska.....3
Econ. 121-122—Principles of Economics.....6
Hist. 341—History of Alaska .....3
Soc. 101-102—Introduction to Sociology .....6

C. Mathematics and Natural Sciences (Anth. 401, Biological Sciences, Chemistry, Geog. 105-401, Geology, Physics) .....8

D. Education (students must maintain a 2.00 grade point average in each required Education course and an overall GPA of 2.00) .....34
1. Required courses:
Ed. 201—Orientation to Education.....3
Ed. 313—Educational Psychology .....3
Ed. 314—Practicum in Tutoring: Behavior Modification.....1
Ed. 421—Secondary Education.....3
Ed. 332—Tests and Measurements .....3
Ed. 402 *or* 404 *or* 405 *or* 406 *or* 407 *or* 408—Methods .....3
*Ed. 452—Student Teaching.....9

*Candidates who have taught successfully two years in the public secondary schools may petition to be excused from Ed. 452.

2. Three credits from the following courses:
Ed. 345—Sociology of Education .....3
Ed. 348—History of Education.....3
Ed. 422—Philosophy of Education .....3

Ed. 446—Public School Organization, Control and Support .....3
Ed. 480—Education of Culturally Different Youth.....3

3. Three credits of education electives selected from the following:
Ed. 311—Audio Visual Methods & Materials.....3
Ed. 426—Principles and Practices of Guidance.....3

E. Teaching majors and minors (students must maintain at least a 2.00 GPA in their teaching majors):

**Option A:** Complete a teaching major of at least 26 approved credits and a teaching minor of at least 16 approved credits for a total of 51 credits of which at least 18 must be upper division. See advisor.

**Option B:** Complete an integrated teaching major-minor of 51 approved credits. See advisor.

**Major or Minor (Option A):**

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

**Minor Only (Option A):**

| | |
|---|---|
| ***Economics | *Political Science |
| *Geography | *Sociology |
| Journalism | |

**Integrated Major-Minor (Option B):**

| | |
|---|---|
| General Science | Earth Sciences |
| Social Sciences | |

F. Forty-eight credits of upper division courses, 24 of which must be completed at the University of Alaska.
G. Sufficient free electives to total 130 credits.

*Approved for history major only
**Confer with head of the Department of Education.
***Approved for history and business education teaching majors only.

Credit earned in fulfillment of (B), (C), and (D) above may be applied toward the teaching major and teaching minor. The student is responsible for obtaining and keeping current his copy of the courses required for his teaching major and minor. Any deviations from the specified courses must be approved by written petition to the head of the Education Department.

### Minor in Secondary Education and Minimum* Requirements for Secondary Teacher Credential Endorsement

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

| | *Fall Semester* | *Spring Semester* |
|---|---|---|
| Sophomore | Psy. 101 | **Psy. 246 |
| Junior | **Ed. 313 | **Ed. 332 |
| | **Ed. 314 | |
| Senior | **Ed. 421 | **Ed. 452 |
| | **Ed. 402, 404, 405, 406, 407 or 408 | |

*See Advisor or Advisory Committee.
**Students must maintain a 2.00 GPA in these courses.

### Requirements for Admission to Student Teaching

1. Early Childhood—kindergarten through second grade

a. Acceptance to the Teacher Education Program.
b. A formal application on file with the coordinator of student teaching by November 1 for student teaching in the following spring semester and by March 15 for student teaching in the following fall semester.
c. A completed physical examination.
d. Completion of 100 credits leading to a bachelor's degree with a minimum GPA of 2.00.
e. Completion of Psy. 101, Psy. 244 or 245, Ed. 313-314, Ed. 331, Ed. 410, two other elementary methods courses and required Home Economics courses.
f. A minimum GPA of 2.00 in each required psychology course, home economics course, and each education course attempted, including a minimum GPA of 2.00 in each elementary methods and materials course attempted.
g. Approval of Committee on Admission to Teacher Education to enter student teaching.
h. A maximum of 15 credits is permitted while enrolled in student teaching. These 15 credits include the 9 credits granted for student teaching.
i. Those students who meet all of the above requirements at another university must take at least 9 units of education courses at the University of Alaska, Fairbanks.

2. Elementary School—kindergarten through eighth grade:

a. Acceptance to the Teacher Education Program.
b. A formal application on file with the director of Student Teaching by November 1 for student teaching in the following spring semester and by March 15 for student teaching in the following fall semester.
c. A completed physical examination.
d. Completion of 100 credits leading to a bachelor's degree with a minimum GPA of 2.00.
e. Completion of Psy. 101, Psy. 245, six hours in mathematics, Ed. 313, Ed. 314, Ed. 332, Ed. 409 and two other elementary methods and materials courses.

f. A minimum GPA of 2.00 in each required psychology and each education course attempted, including a minimum GPA of 2.00 in each elementary methods and materials course attempted.

g. Approval of Committee on Admission to Teacher Education to enter student teaching.

h. A maximum of 15 credits is permitted while enrolled in student teaching. These 15 credits include the 9 credits granted for student teaching.

i. Those students who meet all of the above requirements at another university must take at least nine (9) units of education courses at the University of Alaska, Fairbanks.

3. Secondary Schools—seventh grade through twelfth grade:

a. Acceptance to Teacher Education Program.

b. A formal application on file with the director of Student Teaching by November 1 for student teaching in the following spring semester and by March 15 for student teaching in the following fall semester.

c. A completed physical examination.

d. Completion of 100 credits leading to a bachelor's degree with a minimum G.P.A. of 2.00.

e. Completion of a minimum of 24 approved credits in an approved teaching major with a G.P.A. of 2.00 or more.

f. Completion of Psy. 101, Psy. 246, Ed. 313-314, Ed. 332 and Ed. 421 with a minimum G.P.A. of 2.00 in Psy. 246, Ed. 313-314, Ed. 332, and Ed. 421.

g. A maximum of 15 credits is permitted while enrolled in student teaching. These 15 credits include the 9 credits granted for student teaching.

h. A minimum GPA of 2.00 in all education courses attempted.

i. Approval of Committee on Admission to the Teacher Education Program to enter student teaching.

j. Those students who meet all of the above requirements at another university must take at least nine (9) units of education courses at the University of Alaska, Fairbanks.

### M.Ed. Degree

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

**Admission Requirements for M.Ed. Degrees in Education, Guidance and Counseling, and Public School Administration:**

1. The equivalent of a University of Alaska Bachelor of Education degree or Alaska teaching certificate with a minimum of 24 semester hours of education courses with an average GPA of 3.00.
2. One year of satisfactory teaching experience or administrative experience in public schools.
3. Admission also may be contingent upon (1) satisfactory scores on various standardized tests and (2) a satisfactory personal interview conducted by Department of Education faculty members.

**Minimum Degree Requirements:**

1. Complete the general University requirements and master's degree requirements, pages 27 and 29-30.
2. Complete a minimum of 36 credits in approved courses in a non-thesis program, including Ed. 601 and Ed. 627 or 30 credits of approved courses in a thesis program including Ed. 601 and Ed. 627.
3. Pass a comprehensive examination.

### Guidance and Counseling with Concentration in College Student Personnel Administration — M.Ed. Degree

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

**Admission Requirements**

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

**Minimum Degree Requirements**

1. Complete the general University requirements and master's degree requirements, pages 27 and 29-30.
2. Complete a minimum of 36 credits in approved courses in a non-thesis program including Ed. 627 or 30 credits of approved courses in a thesis program including Ed. 627.
3. Pass a comprehensive examination.

### Vocational Administration—M.Ed. Degree

This degree is designed to serve baccalaureate graduates with a major concentration in a subject normally taught in high school or community college vocational education programs coupled with successful teaching experience, who aspire to leadership and

change agent roles. Subjects normally taught in high schools or community colleges are:

Accounting and Bookkeeping
Agriculture
Clerical Occupations
Communications
Construction
Electricity/Electronics
Fisheries
Food Services
Forestry and Forest Products
Health Occupations
Industrial Mechanics
Marketing
Metals
Service Occupations
Steno/Secretarial
Transportation

**Admission Requirements**

1. The equivalent of a University of Alaska Bachelor of Education degree with a concentration in a subject normally taught in a high school or community college vocational education program or an Alaska vocational teacher certificate with a minimum of 24 semester hours of education courses with average GPA of 3.00.
2. One year of satisfactory teaching experience or administrative experience in an accredited public secondary school or in a community college.
3. Admission also may be contingent upon (1) satisfactory scores on various standardized tests and (2) a satisfactory personal interview conducted by Department of Education faculty members.

**Minimum Degree Requirements**

1. Complete the general University requirements and master's degree requirements, pages 27 and 29-30.
2. Complete a minimum of 36 credits in approved courses in a non-thesis program including Ed. 627 or 30 credits of approved courses in a thesis program including Ed. 627.
3. Pass a comprehensive examination.

### Vocational Education—M.Ed. Degree

This degree is designed to serve baccalaureate graduates with a major concentration in a subject normally taught in a high school or community college vocational education program for a specialized career in teaching. Subjects normally taught in high schools or community colleges are:

Accounting and Bookkeeping
Agriculture
Clerical Occupations
Communications
Construction
Electricity/Electronics
Fisheries
Food Services
Forestry and Forest Products
Health Occupations
Industrial Mechanics
Marketing
Metals
Service Occupations
Steno/Secretarial
Transportation

**Admission Requirements**

1. The equivalent of a University of Alaska Bachelor of Education degree with a concentration in a subject normally taught in a high school or community college vocational education program or an Alaska teaching certificate with a minimum of 24 semester hours of education courses with an average GPA of 3.00.
2. One year of satisfactory teaching experience or administrative experience in an accredited public secondary school or in a community college.
3. Admission may also be contingent upon (1) satisfactory scores on various standardized tests and (2) a satisfactory personal interview conducted by Department of Education faculty members.

**Minimum Degree Requirements**

1. Complete the general University requirements and master's degree requirements, pages 27 and 29-30.
2. Complete a minimum of 36 credits in approved courses in a non-thesis program including Ed. 627 or 30 credits of approved courses in a thesis program including Ed. 627.
3. Pass a comprehensive examination.

### Master of Arts in Teaching

The Master of Arts in Teaching is designed to serve the following groups of students:

**1.** Baccalaureate graduates with a good general education and with majors or equivalent majors in subjects commonly taught in high school who wish to prepare for a career in secondary school classroom teaching.

**2.** Baccalaureate graduates with a good general education and with majors or equivalent majors in a basic academic discipline who wish to prepare for a career in elementary school classroom teaching.

**3.** Baccalaureate graduates who have or who can academically qualify for the Alaska secondary school certificate, who intend to make secondary school classroom teaching their career, and who wish to take additional work in their teaching major and/or minor as well as in education.

Interested persons in the first two categories should contact the head of the Education Department for additional information; interested persons in the third category should contact the head of the department of their teaching major.

### School Administration—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; and (4) who wish to develop a background of knowledge in fields other than education.

**Admission Requirements**

1. Applicants must be experienced educators who have successfully completed at least one year of elementary and/or secondary teaching.
2. All candidates should meet the University of Alaska Bachelor of Education degree requirements (or equivalent) for either elementary or secondary education majors with a minimum of 24 semester hours of education courses with an average GPA of 3.00.
3. A master's degree preferred but not necessary.
4. Submission to the Director of Admissions:
   a. A completed university application for admission to graduate study.
   b. Official transcripts of all previous college or university work.
   c. Three letters of reference, at least one from the most recent employer, testifying as to teaching or administrative ability.
5. Admission also will be contingent upon: (1) satisfactory scores on the aptitude section of the Graduate Record Examination and/or the Miller Analogies Test; and (2) a satisfactory personal interview conducted by Department of Education faculty members.

**Minimum Degree Requirements**

1. Complete the general University requirements and educational specialists degree requirements, pages 27 and 29-30.
2. Complete 60 semester hours beyond the bachelor's degree, including a minimum of 18 semester hours at the graduate level. At least 24 semester hours of work must be completed at the University of Alaska. The University may accept a maximum of 36 semester hours of transfer credit. Acceptance of transfer credits is contingent upon approval by the student's advisory committee and by the Dean of the College of Behavioral Sciences and Education.
3. Fulfillment of the requirements of the Ed.S. degree must be completed within seven years after admission to the program.
4. Satisfactory performance on a written and/or oral examination conducted by the Department of Education faculty and representatives from the student's academic discipline is required.

## ELECTRICAL ENGINEERING

*College of Mathematics, Physical Sciences, and Engineering*

**Degrees:** Bachelor of Science, Master of Science, Master of Electrical Engineering

**Minimum Requirements for Degrees:** B.S.—130 Credits; M.S.—30 Additional Credits; M.E.E.—162 Credits.

Electrical engineering includes all applications of electrical power and electrical and electronic signals. The electrical engineer designs and oversees the construction, installation, and maintenance of electrical systems—for cities and satellites — providing light and heat and power. He contributes the communication systems of telephone, telegraph, radio, and television, as well as the vacuum tubes, transistors, and integrated circuits used in these systems. He automates businesses, factories, pipelines, and refineries; and his control systems and computers 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 and products of his imagination.

While electrical engineers can point with pride to many accomplishments, they should look ahead to the opportunities and challenges of the profession, 10, 20, or more years in the future. Certainly, engineering and scientific realities of tomorrow must surpass our vision of today. Electrical engineering has expanded tremendously in scope in recent years. Many developments have been basically important in this expansion, including automatic control theory, environmental monitoring, communications theory, the transistor, new geophysical instrumentation, digital computers, extra-high-voltage power transmission, integrated circuits, medical electronics, plasmas, magnetohydrodynamics, satellites, meteorological instrumentation, space technology, lasers, new materials, and fuel cells. The process controls in the extraction, transmission, and refining of petroleum products are largely the responsibility of the electrical engineer. Development of techniques for utilizing new energy sources presents a fascinating and challenging problem, requiring much imagination and resourcefulness. Advanced training in engineering science and

mathematics is generally required for creative work in these areas.

The electrical engineering curriculum has been carefully planned so that basic principles would be learned by all, and so that the graduating engineer can have access to his choice of these many applications of electrical energy, signals, and systems.

Candidates for the Bachelor of Science degree are required to take an examination in their general field. (The State of Alaska Engineer-in-Training Examination will satisfy this requirement.)

Graduate students whose goal is broad professional practice will ordinarily choose the M.E.E. program; those who wish to emphasize research and advanced specialized study usually elect the M.S. degree program, which includes a thesis.

### Electrical Engineering—B.S. Degree

**1.** Complete the general University requirements as listed on page 27.

**2.** Complete the following degree and program (major) requirements:

**First Year**

*Fall Semester* — *16 Credits*
- Engl. 111—Methods of Written Comm. ....3
- Math. 200—Calculus ....4
- E.S. 101—Graphics ....2
- E.S. 111—Engineering Science ....3
- Chemistry or Biology ....4

*Spring Semester* — *16 Credits*
- Sp.C. 111—Fund of Oral Comm. ....3
- Math. 201—Calculus ....4
- E.S. 102—Graphics ....2
- E.E. 102—Intro. to Elec. Engr. *or* C.E. 112—Elem. Surveying ....3
- Chemistry or Biology ....4

**Second Year**

*Fall Semester* — *15 Credits*
- Math. 202—Calculus ....4
- Phys. 211—General Physics ....4
- E.S. 201—Computer Techniques ....3
- E.E. 203—Fund. of Elec. Engineering ....4

*Spring Semester* — *15 Credits*
- Math. 302—Differential Equations ....3
- Phys. 212—General Physics ....4
- E.S. 208—Mechanics ....4
- E.E. 204—Fund. of Elec. Engr. ....4

**Third Year**

*Fall Semester* — *18 Credits*
- E.E. 333—Physical Electronics ....3
- E.E. 323—Elec. Engr. Lab I ....1
- E.E. 353—Circuit Theory I ....3
- Math. 321—Intermed. Applied Math ....4
- Soc. Sci. or Humanities ....3

Option I: Communications
- Phys. 331—Electricity & Magnetism ....3
- E.E. 431—High Frequency Lab ....1

Option II: Power and Control
- E.E. 403—Elec. Power Eng. I ....4

*Spring Semester* — *18 Credits*
- E.E. 334—Electronic Circuits ....3
- E.E. 324—Elec. Engr. Lab II ....1
- E.E. 354—Circuit Theory II ....3
- Eng. 211 or 213 ....3
- Math. 422—Intermed. Applied Math. ....4

Option I: Communications
- E.E. 332—Electromagnetic Waves and Antennas ....3
- E.E. 432—High Frequency Lab ....1

Option II: Power and Control
- E.E. 404—Elec. Power Eng. II ....4

**Fourth Year**

*Fall Semester* — *17 Credits*
- E.S. 331—Mechanics of Materials ....3
- E.E. 471—Fund. of Auto. Control I ....4
- Soc. Sci. or Humanities ....6

Option I: Communications
- E.E. 403—Elec. Power Eng. I ....4

Option II: Power and Control
- Phys. 331—Electricity & Magnetism ....3
- E.E. 433—High Frequency Lab ....1

*Spring Semester* — *16 or 17 Credits*
- E.S. 346—Basic Thermodynamics ....3
- E.S. 450—Engineering Management ....3
- Soc. Sci. or Humanities ....6
- E.E. 491—Seminar ....1

Option I: Communications
- E.E. 462—Communications Systems ....4

Option II: Power and Control
- E.E. Elective ....3

### Electrical Engineering—M.E.E. Degree

Students selecting the Master of Electrical Engineering program will meet the general University requirements and master's degree requirements, pages 27 and 29-30, be guided in course work and an engineering project by a personal advisor, and accumulate a total of 32 semester hours of approved courses.

In addition to electrical engineering courses, additional subjects may be selected from the broad spectrum of advanced undergraduate and graduate courses in engineering, sciences, and management, according to the student's needs. Candidates for the M.E.E. degree must pass a State Engineering-in-Training Examination prior to the awarding of the degree.

**Electrical Engineering—M.S. Degree**

A candidate for the Master of Science degree will meet the general University requirements and master's degree requirements, pages 27 and 29-30, plus 30 semester hours of credit approved by his graduate committee, of which six to twelve semester hours will be E.E. 699—Thesis. Courses may be selected from the fields of engineering, sciences, and other areas according to the student's desired specialization.

## ELECTRONICS TECHNOLOGY PROGRAM

*College of Mathematics, Physical Sciences, and Engineering*

**Degree:** Associate in Electronics Technology
**Minimum Requirements for Degree:**
65 Credits.

The program in electronics technology prepares people to maintain, install, and operate electronic and mechanical equipment.

For students selecting electronics technology as their area of study, emphasis will be placed on equipment such as digital computers, telemetry systems, airways control equipment, carrier telephone systems, and broadcast transmitters.

For students selecting electro-mechanics as their area of study, emphasis will be placed on precision and high speed electro-mechanical devices and systems, such as high speed printers, office machines, servo systems, fluid power systems, industrial control systems, etc.

The program is not introductory electrical or mechanical engineering, which emphasizes design; it is electronics technology, which emphasizes maintenance.

**Electronics Technology—A.E.T. Degree**

1. Complete the general University requirements as listed on page 27.
2. Complete the following degree and program (major) requirements:

**First Year**

| *Fall and Spring Semesters* | *16 Credits* |
|---|---|
| E.T. 151—DC Circuits | 4 |
| E.T. 152—AC Circuits | 4 |
| E.T. 157—Logic Circuits and Boolean Algebra | 3 |
| E.T. 159—Math for Electronics | 5 |

| *Spring and Summer Semesters* | *17 Credits* |
|---|---|
| E.T. 165—Semiconductor Devices and Circuits | 3 |
| E.T. 166—Electronics Practice | 3 |
| E.T. 168—Basic Circuit Theory | 3 |
| E.T. 184—Digital Computer Theory | 5 |
| Engl. 67—Elementary Exposition *or* Engl. 111—Methods of Written Comm. | 3 |

**Second Year**

| *Summer and Fall Semesters* | *17 Credits* |
|---|---|
| E.T. 275—Microwave Electronics | 3 |
| E.T. 278—Solid State Electronics | 4 |
| E.T. 281—Telemetry | 4 |
| E.T. 283—Waveshaping Circuits | 3 |
| E.T. 282—Communication Circuits | 3 |

| *Fall and Spring Semesters* | *15 Credits* |
|---|---|
| E.T. 287—Modern Communication Techniques | 4 |
| E.T. 289—Solid State Systems Development | 5 |
| B.A. 165—B.A. for Tech. | 3 |
| Social Science Elective | 3 |

## ENGINEERING AND SCIENCE MANAGEMENT

*College of Mathematics, Physical Sciences, and Engineering*

**Degrees:** Master of Science in Engineering Management, Master of Science in Science Management
**Minimum Requirements for Degrees:**
30 Credits (Beyond a Bachelor's Degree in Engineering or a Scientific Field)

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

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

Candidates for the Engineering Management degree must hold a previous degree in an engineering discipline; candidates for the Science Management degree must hold a degree in a scientific field.

**Engineering Management—M.S. Degree**
**Science Management—M.S. Degree**

1. Complete the general University requirements and master's degree requirements as listed on pages 27 and 29-30.
2. Complete the following degree and program (major) requirements:

| *Fall Semester* | *15 Credits* |
|---|---|
| ESM 605—Adv. Engineering Economy | 3 |
| ESM 611—Engineering Management | 3 |
| An approved course in legal principles | 3 |
| *Electives | 6 |

| *Spring Semester* | *15 Credits* |
|---|---|
| ESM 612—Engineering Management | 3 |
| ESM 613—Engineering Management | 3 |
| ESM 621—Operations Research | 3 |
| ESM 684—Project | 3 |
| *Elective | 3 |

*Electives must have the approval of the department. Electives may include advanced courses in computer science but not courses in basic FORTRAN.

In addition to completing the 30 semester-hours indicated above, a candidate must demonstrate competence in computer programming by passing a programming course or a qualifying examination.

Substitutions for one or more of the courses listed above are permitted if similar courses are included in the student's previous academic background. No more than nine semester hours of appropriate graduate-level course work completed at other institutions with a grade of A or B may be transferred and applied toward the total 30 credit hours of required and elective courses. Both substitutions and transfers must be approved by the department.

## ENGLISH

*College of Arts and Letters*

**Degrees:** Bachelor of Arts, Master of Arts, Master of Fine Arts, Master of Arts in Teaching
**Minimum Requirements for Degrees:** B.A.—130 Credits; M.A.—30 Additional Credits; M.F.A.—45 Additional Credits; M.A.T.—30 Additional Credits.

The work of the Department of English includes the two functions traditionally associated with the discipline of teaching English language and literature—instructing all students in basic and advanced courses in written composition and offering survey and advanced courses in English, American, and World literature both to English majors and minors and to students in other fields who may choose the courses as electives. In addition to these functions, the Department engages in several others inspired by its location at the Polar crossroads of the world—teaching special courses in English language for Alaska Native students, several courses in linguistics, and courses in Alaska Native literature, Canadian literature, and World literature. The Department also offers several programs of graduate study, including work in research and scholarship, original writing, and preparation for teaching English.

**English—B.A. Degree**

A. (Emphasis: Literature)

1. Complete the general University requirements and B.A. degree requirements, pages 27-9.
2. Complete the following program (major) requirements: 36 credits in English besides Engl. 111 and Engl. 211 or 213, including:

*Credits*

a. Engl. 301 and 302—Survey of World Lit. ..... 6
b. One course chosen from each of the following sequences:
*British Literature:*
Engl. 303—Survey of British Literature: From Beowulf through the Early Renaissance,
*or* Engl. 304—Survey of British Literature: From the Late Renaissance through the Neoclassical Period,
*or* Engl. 305—Survey of British Literature: From the Romantic Period to the Present ..... 3
*American Literature:*
Engl. 306—Survey of American Literature: From the Colonial Period to the Civil War
*or* Engl. 307—Survey of American Literature: From the Civil War to the Present ..... 3
*World Literature:*
Engl. 401—World Literature: Selected Masterpieces from Homer through Dante,
*or* Engl. 402—World Literature: Selected Masterpieces from Cervantes to Present ..... 3
c. Engl. 422 or 425—Shakespeare ..... 3
d. One course from the following:
Engl. 421—Chaucer,
*or* Engl. 426—Milton ..... 3
e. One course from the following:
Engl. 462—Applied English Linguistics,
*or* Engl. 472—History of the English Lang. ..... 3
f. Four courses chosen from 300- 400- levels in English with at least two courses on 400-level ..... 12

**B. (Emphasis: Forms and Techniques of Writing)**

**1.** Complete the general University requirements and B.A. degree requirements, pages 27-9.

**2.** Complete the following program (major) requirements: 36 credits in English besides Engl. 111 and Engl. 211 or 213, including:

*Credits*

a, b, and c as listed in the requirements for a major with emphasis on literature ..... 18
d. Two courses from the following:
Engl. 445—20th-Century Drama: From Chekhov to Ionesco,
*or* Engl. 446—20th-Century British and American Poetry,
*or* Engl. 452—The British Novel to 1900 ..... 6
e. Two courses from the following:
Engl. 481—Craft of Poetry,
*or* Engl. 482—Craft of Fiction,
*or* Engl. 483—Craft of Drama,
*or* Engl. 484—Craft of Non-Fiction Prose ..... 6
f. Two courses chosen from 400-level in English .. 6

**Requirements for a minor in English:**

Complete 21 credits in English besides Engl. 111 and Engl. 211 or 213, including:

a, b, and c as listed in the requirements for a major with emphasis on literature ..... 18
d. One 400-level English course ..... 3

**English—M.A. Degree**

**1.** Complete the general University requirements and master's degree requirements, pages 27 and 29-30.

**2.** Demonstrate reading knowledge of a foreign language.

**3.** Complete a minimum of 30 approved credits on 400--600-levels, distributed as follows:

*Credits*

Engl. 601—Bibliography, Meth., & Criticism ..... 3
Six courses in English chosen in consultation with and approved by the graduate committee ..... 18
Engl. 692—Seminar ..... 3
Engl. 699—Thesis ..... 6

**English—M.A.T. Degree**

**1.** Complete the general University requirements and master's degree requirements, pages 27 and 29-30.

**2.** Complete a minimum of 30 approved credits, including at least 15 in English taken at the University of Alaska, Fairbanks.

This degree is designed to serve the baccalaureate graduate who has qualified or who can qualify for the Alaska secondary school certificate; who intends to make secondary school classroom teaching his career; and who wishes to take additional work in English as well as in education. A student's graduate committee will counsel him in planning his program.

**English—M.F.A. Degree**

**1.** Complete the general University requirements and master's degree requirements, pages 27 and 29-30.

**2.** Demonstrate reading knowledge of a foreign language.

**3.** Complete a minimum of 45 approved credits on 400—600 levels, distributed as follows:

*Credits*

Engl. 601—Bibliography, Meth., & Criticism ..... 3
Five courses chosen from the following group, including two "craft" courses and two other courses, and representing poetry, fiction, and drama at least once each*:
Engl. 445—20th-Century Drama: From Chekhov to Ionesco ..... 3
Engl. 446—20th-Century British and American Poetry ..... 3
Engl. 452—The British Novel to 1900 ..... 3
Engl. 481—Craft of Poetry ..... 3
Engl. 482—Craft of Fiction ..... 3
Engl. 483—Craft of Drama ..... 3
Engl. 484—Craft of Non-Fiction Prose ..... 3
Engl. 671—Writers' Workshop** ..... 3
Engl. 692—Seminar ..... 3
Three elective English courses ..... 9
Two elective interdisciplinary courses (to be approved by the graduate committee, with each course in a separate area unless the committee approves both in the same area) ..... 6
Engl. 699—Thesis ..... 6

*If the student has met any or all of this requirement as an undergraduate, he may substitute English or interdisciplinary electives subject to approval by the graduate committee.

**The student may take Engl. 671 a second time for credit, as one of his three elective English courses.

## ENVIRONMENTAL QUALITY ENGINEERING PROGRAM

*College of Mathematics, Physical Sciences, and Engineering*

**Degree:** Master of Science
**Minimum Requirements for Degree:**
30 Credits (Beyond a Bachelor's Degree in Engineering or a science field)

The environmental quality engineering curriculum is designed for graduate engineers who will pursue a career in the areas of water supply, treatment, and distribution; waste treatment, stream pollution, air pollution, and solid-waste disposal. Consideration for broad study of the environment, prevention of quality deterioration, and solutions. 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. Applicants should refer to the general requirements for graduate study, pages 27 and 29-30.

**Environmental Quality Engineering—M.S. Degree**
**Environmental Quality Science—M.S. Degree (Interdisciplinary)**

1. Complete the general University requirements and master's degree requirements as listed on pages 27 and 29-30.
2. Complete the following degree and program (major) requirements:

| | *Credits* |
|---|---|
| EQS 401—EQS Measurements | 3 |
| EQE 402—Engr. Management of Water Quality | 3 |
| EQS 403—Solid Waste and Air Pollution | 3 |
| EQE 604—Environ. Quality Evaluation | 3 |
| EQE 605—C/P Processes | 3 |
| EQE 606—Bio. Processes | 3 |
| *EQE 693/694—Special Topics | 0-3 |
| *EQE. 697—Individual Study | 0-6 |
| *EQE 697—Individual Study (Special Project) | 3 |
| *EQE 699—Thesis | 0-6 |
| *Electives | 6-9 |

*Electives must have approval of graduate committee.

A minimum of 30 credits of approved and required courses must be completed. Thesis study (6 credits) is optional.

| | |
|---|---|
| Thesis Option: | |
| Required courses | 24 Credits |
| Electives | 6 Credits |
| Total | 30 |
| Non-Thesis Option: | |
| Required courses | 21 Credits |
| Electives | 6 Credits |
| Total | 30 |

All students will be expected to have a basic knowledge of computer programming.

## FISHERIES BIOLOGY

*College of Biological Sciences and Renewable Resources*

**Degrees:** Bachelor of Science, Master of Science

**Minimum Requirements for Degrees:** B.S.—130 Credits; M.S.—30 Additional Credits.

The Fisheries Biology curriculum in the undergraduate program of the Department of Wildlife and Fisheries is intended to provide broad basic education and training. Holders of the bachelor's degree will be qualified to enter the management, law enforcement, and public information-education phases of fisheries work. Students contemplating careers in research, administration, advanced management, or teaching will find the bachelor's curriculum a solid foundation for graduate study.

The geographic location of the University is advantageous for the study of Interior Alaska aquatic habitats. A number of subarctic streams and lakes are within easy reach. Access to the marine environment is being obtained through the National Sea Grant Program in Prince William Sound.

Adequate study collections of fishes are available, and the invertebrate collection is being rapidly expanded. Undergraduates have an opportunity for association with personnel of federal and state conservation agencies and these agencies hire a number of students for summer field work.

Fisheries play an extremely important part in the economy and recreation of Alaskans; because of this, some courses in the department will be of interest to non-major students. Under the college's National Sea Grant Program, the fisheries curriculum is being expanded to produce graduates prepared to play important roles in research and in the development and conservation of Alaska's aquatic resources.

**Fisheries Biology—B.S. Degree**

1. Complete the general University requirements as listed on page 27.
2. Complete the following degree and program (major) requirements:

**First Year**

| *Fall Semester* | *16 Credits* |
|---|---|
| Biol. 107-108—Fund. of Biology | 4 |
| Chem. 105—General Chemistry | 4 |
| Engl. 111—Methods of Written Comm | 3 |
| †Math. 170—Derivative for the Life Sciences | 1 |
| L.R. 102-103—Conservation of Nat. Resources | 3 |
| *Spring Semester* | *15 Credits* |
| *Biol. 210—General Physiology | 4 |
| Chem. 106—General Chemistry | 4 |
| *Biol. 239—Plant Form and Function | 4 |
| Math. 172—An Introduction to Calculus for the Life Scientist | 4 |

**Second Year**

| *Fall Semester* | *12+ Credits* |
|---|---|
| Biol. 271—Principles of Ecology | 3 |
| Math. 203—Intro. to Finite Mathematics | 4 |

Biol. 305—Invertebrate Zoology .....4
W.F. 333—Lit. of Ecology and Resource Mgmt. .....1
*Spring Semester* *13+ Credits*
Biol. 205—Vertebrate Anatomy.....3
Biol. 222—Biology of Vertebrates.....4
Speech Comm. elective.....3
Econ. 235—Resource Economics.....3

**Third Year**
*Fall Semester* *17 Credits*
Phys. 103—College Physics .....4
W.F. 301—Pop. Dynamics & Management.....3
**Foreign Language.....3
Engl. 211 or 213—Intermed. Exposition .....3
Biol. 423—Ichthyology Herpetology .....4
*Spring Semester* *13+ Credits*
Phys. 104—College Physics .....4
A.S. 301—Elementary Statistics.....3
**Foreign Language.....3
Biol. 252—Principles of Genetics.....3

**Fourth Year**
*Fall Semester* *8+ Credits*
Geol. 411—General Oceanography
*or* W.F. 423—Limnology .....3
W.F. 429—Gen. Fisheries Biology.....3
W.F. 435—Water Pollution Biology .....2
*Spring Semester* *11+ Credits*
W.F. 430—Fisheries Management.....3
A.S. 402—Scientific Sampling .....3
Engl. 414—Research Writing.....3
W.F. 436—Advanced Aquaculture.....2

**In addition:**
1. Complete remaining B.S. Social Science/ Humanities requirement.....9
2. Either Biol. 328 (Marine Animals) *or* Biol. 476 (Animal Ecology) .....3
3. Complete sufficient electives to bring the total credits to ..... 130

Bachelor of science candidates are strongly urged to obtain work experience in fisheries-related positions with public resource agencies or private firms. Faculty members can help students contact potential employers. Fisheries undergraduate students will be asked each fall to describe their work experience of the previous year.

†Students inadequately prepared for calculus will take Math. 171 (4 credits) rather than Math. 170.

*Note prerequisite.

**One year of foreign language taken at the university level. French, German, Russian, or Japanese are recommended. Students having 3 or 4 years of language in high school with a grade of C or better, may, with advisor's approval, substitute an equivalent number of credits in the humanities area.

**Fisheries Biology—M.S. Degree**
**1.** Complete the general University requirements and master's degree requirements, pages 27 and 29-30.
**2.** Complete a minimum of 30 credits of approved courses, including W.F. 699—Thesis, in the field of fisheries biology.
**3.** Students working in subject areas involving significant non-English literature may be expected to read the appropriate foreign language.

**Graduate Study in Fisheries Biology**
The Department of Wildlife and Fisheries offers graduate work leading to the Master of Science degree in Fisheries Biology. In exceptional cases an interdisciplinary Doctor of Philosophy degree can also be offered. Persons desiring detailed information on the graduate program in fisheries may obtain this from the Head, Department of Wildlife and Fisheries. The procedure to be followed in applying for admission to graduate study is outlined in the Admissions section of this catalog.

The department offers a limited number of research assistantships under the National Sea Grant program involving mainly marine fisheries investigations in Prince William Sound. At times, funds become available from the Alaska Department of Fish and Game, the National Marine Fisheries Service, and the Fish and Wildlife Service for special projects.

## GENERAL SCIENCE

*College of Mathematics, Physical Sciences, and Engineering*

**Degrees:** Bachelor of Science, Master of Science

**Minimum Requirements for Degrees:**
B.S.—130 Credits; M.S.—30 Additional Credits

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

Traditionally, the role of mathematics has been to simplify, interpret, and extend the boundaries

of science. The fact that mathematics still includes, as well as transcends, this function makes it a necessary study.

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

**General Science—B.S. Degree**

**1.** Complete the general University requirements as listed on page 27.

**2.** Complete the following degree and program (major) requirements:

**First Year**

| *Fall Semester* | *16 Credits* |
|---|---|
| Engl. 111—Methods of Written Comm | 3 |
| Biol. 107-108—Fund. of Biology | 4 |
| Math. 106—Algebra & Trig | 5 |
| Chem. 105—General Chemistry *or* Phys. 103—College Physics | 4 |
| *Spring Semester* | *15 Credits* |
| Sp.C. 111—Fund. of Oral Comm | 3 |
| Math. 200—Calculus | 4 |
| Chem. 106—General Chemistry *or* Phys. 104—College Physics | 4 |
| Electives | 4 |

**Second Year**

| *Fall Semester* | *17 Credits* |
|---|---|
| Phys. 103—College Physics *or* Chem. 105—General Chemistry | 4 |
| Econ. 121—Principles of Economics | 3 |
| Geol. 101—General Geology | 4 |
| Psy. 101—Intro. to Psychology | 3 |
| Department elective | 3 |
| *Spring Semester* | *16 Credits* |
| Phys. 104—College Physics *or* Chem. 106—General Chemistry | 4 |
| Geol. 112—Historical Geology | 4 |
| Soc. 101—Intro. to Sociology *or* Anth. 101—Study of Man | 3 |
| Electives | 5 |

**Third and Fourth Years**

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

Directions for making out the program:

1. Include the following courses:

| | *Credits* |
|---|---|
| Engl. 211—Intermed. Exposition with Modes of Literature (3) *or* Engl. 213—Intermed. Exposition | 3 |
| Social Science and/or Humanities electives (3 credits must be Humanities) | 6 |

2. The major field must comprise a minimum of 20 credits above the foundation courses included in this curriculum. The courses scheduled must be approved in writing by the head of the major department. A major may be elected in anthropology, biological sciences, chemistry, geology, geophysics, mathematics, or physics.

3. The electives must include either two minors of at least 12 credits each above the foundation courses included in this curriculum, or a second major. Minors may be selected in any of the major departments listed or in the fields of economics, education (minimum 16 credits), English, French, German, Russian, History, or political science.

4. All prerequisites of courses elected must be met.

5. One year of German or Russian is recommended.

6. Courses selected to complete the requirements in the social sciences must be chosen from the following: anthropology except Anth. 402 and archaeology; sociology; economics; history; and political science.

7. Physics 105-106 may alternate for Physics 103-104 and Chem. 211 may alternate for Chem. 105-106.

8. A total of 130 credits is required.

**General Science—M.S. Degree**

**1.** Complete the general University requirements and master's degree requirements, pages 27 and 29-30.

**2.** Complete a minimum of 30 credits of approved courses.

The Departments of Mathematics, Physics, Chemistry, Biological Sciences, and Geology offer work toward the Master of Science degree with a major in General Science. This degree may be described as a "breadth" rather than a "depth" degree, and a candidate is ordinarily pursuing a course of study in which one of these departments is cooperating with at least one other department within the University. A prospective candidate must meet the general requirements for admission and for the awarding of the degree. At least 21 credits must be earned in science and mathematics. At least 12 credits must be earned in the department giving the degree. A thesis (maximum of three ccredits) or project (no credit) must be completed in the major department. It is not intended that the individual ccourses merely satisfy the credit requirements; each course should contribute to the specific aim of the candidate, and the thesis or project should reflect this aim.

## GEOGRAPHY

*College of Earth Sciences and Mineral Industry*

**Degrees:** Bachelor of Arts, Bachelor of Science; Master of Arts or Master of Science in Regional Development

**Minimum Requirement for Degrees:** B.A.—130 Credits; B.S.—130 Credits; M.A.—30 Additional Credits; M.S.—30 Additional Credits.

The department offers undergraduate courses and degrees in geography, and participates in the graduate interdisciplinary program in Regional Development. Geography provides an organized picture of the earth as a whole and of its interrelated regions and activities. It deals both with the natural resources of the earth and with man's use of them. Its methodology includes the observation, measurement, description, and analysis of places or areas—their likenesses, differences, interdependence, and significance. Geography draws upon many related disciplines for needed information; in return it serves by presenting comprehensive, integrated descriptions and interpretations of the total characteristics of areas, economic units, or political entities. It thus serves as a bridge between the physical sciences and the social sciences. At the University of Alaska, geography is offered as (a) part of a broad cultural background in a liberal arts curriculum; (b) as part of a comprehensive program in biological and earth sciences; (c) as background for studies in economics, history, political science, and other social sciences; (d) as preparation for teaching geography, earth science, or social science in elementary or secondary schools; (e) as technical training for professional geographic work in government, business, or industry; (f) as preparation for further graduate study in geography, regional planning, and related disciplines. Students majoring in geography, after completing required fundamental courses, may elect such advanced work in this and other departments as will provide a concentration either in physical science or in social science.

The major in geography and regional development is an interdisciplinary program administered by the Department of Geography. It is designed to prepare undergraduates for professional careers in regional development agencies and for admission to graduate studies, particularly to the master's program at the University of Alaska and other institutions. The program consists of 36 credits in core courses, including a senior year seminar on regional development, and 30 additional credits in related disciplines. These include economics, history, political science, land resources, earth science, and others. The integrating element in the program is the discipline of geography. Each student's program must be approved in advance by the Head, Geography Department.

**Geography—B.A. Degree**

1. Complete the general University requirements and B.A. degree requirements, pages 27-9.
2. Complete the following program (major) requirements:

A. Complete 24 credits in Geography, including the following: Geog. 101 or 103; 105; 202 or 302, 209 or 401; 305 or 311; 306 or 327; 491; geography elective.

B. Complete 20 credits of the following, or approved alternative courses, with grouping to emphasize cultural, economic, physical, or regional geography (can also be used to meet basic degree requirements and to apply toward minor requirements):

Anthropology 203, 204.
Biology 107-108, 271.
Business Administration 292 or 648.
Economics 235, 435.
Geology 101 or 111, 102, 304, 408, 462.
History 255, 354, 355
Land Resources 102-103, 311, 451,
Oceanography 411.
Political Science 321 or 322.
Sociology 207, 406.

C. Approved electives to complete 130 credits.

**Geography—B.S. Degree**

1. Complete general University requirements and B.S. degree requirements, pages 27 and 29.
2. Complete the following program (major) requirements:

A. Complete 12 credits in approved mathematics courses.

B. Complete two minors.

C. Satisfy requirements A, B, and C as stated above for the B.A. degree, with emphasis in either economic or physical geography.

**Geography and Regional Development—B.A. Degree**

1. Complete the general University requirements and B.A. degree requirements as listed on pages 27-9.
2. Complete the following program (major) requirements:

A. Complete 36 credits in the following core courses:

Geography 103, 105, 301, 404, 491
Economics 221, 321 or 324, 337 or 435
Biology 271

Land Resources 102-103
Political Science 211, 301

B. Complete six credits from each of the following five groups (30 credits)

1. Geography 202, 302, 311, 316, 327
2. History 341, 440, 450
3. Sociology 205, 207, 307, 309
4. Geology 101, 403, 408, 411, OCN 411
   With permission: Civil Engineering 603, 649
5. Land Resources 311, 414, 451, 491
   Wildlife and Fisheries 333
   Biology 107-108

**A minor in Geography requires 15 credits in Geography including Geography 101 or 103 and 105.**

## GEOLOGICAL ENGINEERING

*College of Earth Sciences and Mineral Industry*

**Degree:** Bachelor of Science
**Minimum Requirements for Degree:**
130 Credits plus 6 Credits Summer Field Course

Geological Engineering is a branch of engineering dealing with the application of Geology. Geological Engineers work with man's environment in the true sense of the word. Properties of earth materials, exploration activities, geophysical and geochemical prospecting, site investigations and Engineering Geology are all phases of Geological Engineering.

Seniors are encouraged to take the State of Alaska Engineer-in-Training examination as a first step toward registration as Professional Engineers. Graduates of the program are employed by consulting companies as well as in other areas in the public and private sector.

**Geological Engineering—B.S. Degree**

1. Complete the general University requirements as listed on page 27.
2. Complete the following degree and program (major) requirements:

| | *Credits* |
|---|---|
| Chem. 105—General Chemistry *or* Chem. 211—Chemical Principles | 4 |
| Chem. 106—General Chemistry *or* Chem. 212—Introductory Quant. Analysis | 4 |
| Geol. 417—Introduction to Geochemistry | 3 |
| C.E. 435—Soil Mechanics | 3 |
| E.S. 102—Graphics | 2 |
| E.S. 201—Computer Techniques | 3 |
| E.S. 208—Mechanics | 4 |
| E.S. 331—Mechanics of Materials | 3 |
| E.S. 341—Fluid Mechanics | 4 |
| Engl. 111—Methods of Written Comm | 3 |
| Engl. 211—Intermed. Exposition with Modes of Literature *or* Engl. 213—Intermed. Exposition | 3 |
| Geol. 213—Mineralogy | 4 |
| Geol. 214—Petrology | 3 |
| Geol. 261—Geology for Engineers | 3 |
| Geol. 304—Geomorphology | 3 |
| Geol. 314—Structural Geology | 3 |
| Geol. 350—Geologic Field Methods | 2 |
| Geol. 351—Field Geology | 6 |
| Geol. 362—Engineering Geology | 3 |
| Geol. 404—Economic Geology | 3 |
| Geol. 408—Map & Air Photo Interpretation | 3 |
| Geol. 418—Introduction to Geophysics | 3 |
| Math. 200-201-202—Calculus | 12 |
| Math. 302—Differential Equations | 3 |
| A.S. 301—Elementary Probability and Stat | 3 |
| Min. 102—Mining Engineering Systems | 4 |
| Min. 202—Mine Surveying *or* C.E. 112—Elementary Surveying | 3 |
| Phys. 105-106—University Physics | 8 |
| Social Science and Humanities Electives | 18 |
| Speech Communication Elective | 3 |
| *Professional Electives | 10 |
| **Geol. 490—Colloquium | 0 |

**Suggested Curriculum**

**First Year**

| *Fall Semester* | *17 Credits* |
|---|---|
| Chem. 105—General Chemistry *or* Chem. 211—Chemical Principles | 4 |
| Engl. 111—Methods of Written Comm | 3 |
| Math. 200—Calculus | 4 |
| Speech Communication elective | 3 |
| Soc. Science elective | 3 |

| *Spring Semester* | *16 Credits* |
|---|---|
| Chem. 106—General Chemistry *or* Chem. 212—Intro. Quant. Analysis | 4 |
| E.S. 102—Graphics | 2 |
| Math. 201—Calculus | 4 |
| C.E. 112 or Min. 202 | 3 |
| Geol. 261—Geology for Engineers | 3 |

**Second Year**

| *Fall Semester* | *18 Credits* |
|---|---|
| Geol. 213—Mineralogy | 4 |
| Math. 202—Calculus | 4 |
| Phys. 105—University Physics | 4 |
| Engl. 211 or 213 | 3 |
| **Geol. 490—Colloquium "Geosciences Seminar" | 0 |
| Social Sciences elective | 3 |

| *Spring Semester* | *17 Credits* |
|---|---|
| E.S. 208—Mechanics | 4 |

Geol. 214—Petrology ..... 3
Math. 302—Differential Equations ..... 3
E.S. 201—Computer Tech ..... 3
Phys. 106—University Physics ..... 4

**Third Year**

*Fall Semester* — *16 Credits*
E.S. 331—Mechanics of Materials ..... 3
E.S. 341—Fluid Mechanics ..... 4
A.S. 301—Probability & Stat. ..... 3
Social Science or Humanities elective ..... 3
*Professional elective ..... 3

*Spring Semester* — *17 Credits*
Geol. 314—Structural Geology ..... 3
Geol. 350—Geologic Field Methods ..... 2
Geol. 418—Intro. to Geophysics ..... 3
Min. 102—Mining Engineering Systems ..... 4
Social Science or Humanities elective ..... 3
*Professional elective ..... 2

**Fourth Year**

*Summer* — *6 Credits*
Geol. 351—Field Geology ..... 6
(6 Weeks)

*Fall Semester* — *15 Credits*
Geol. 382—Engr. Geol. ..... 3
Geol. 304—Geomorph. ..... 3
C.E. 435—Soil Mech ..... 3
Geol. 417—Introl Geochem ..... 3
*Professional elective ..... 3

*Spring Semester* — *14-15 Credits*
Geol. 404—Econ. Geol. ..... 3
Geol. 408—Air Photo ..... 3
Social Science elective ..... 6
*Professional elective ..... 2-3

*See list of professional electives on page 90.
**Students are required to register each semester after their freshman year (unless course conflicts make it impossible to register for Geol. 490).

## GEOLOGY

*College of Earth Sciences and Mineral Industry*

**Degrees:** Bachelor of Science, Master of Science, Master of Arts in Teaching, Doctor of Philosophy

**Minimum Requirements for Degrees:** B.S.—130 Credits plus 6 Credits Summer Field Courses: M.S.—30 Additional Credits, Including Thesis; M..A.T. — 30 Additional Credits; Ph.D. (Open)

Graduates in geology will have broad backgrounds in the earth sciences with firm foundations in mathematics, physics, and chemistry. There are many options available in the geological sciences, and the suggested curriculum is intended to be flexible enough so that the student can pursue his own interests as much as possible in the junior and senior years. The bachelor's degree should prepare one for positions with government or industry or for graduate studies. Graduate programs are tailored to the special research and study interest of the student. In addition to courses listed under the Geology Department, students should check the course listings under the Mathematics, Physics, Chemistry, and Civil Engineering departments. Special attention is called to the courses in geophysics, listed under the Physics Department, and those in oceanography and marine geology, listed under the Oceanography and Ocean Engineering (OCN) program.

In addition to formal course work, there are many other opportunities for professional education and experience on the campus.

All serious students of the geological sciences at the University of Alaska should make it a point to keep themselves aware of the research programs and special seminars which are constantly underway at the Geophysical Institute and the Institute of Marine Science.

**Geology—B.S. Degree**

1. Complete the general University requirements as listed on page 27.
2. Complete the following degree and program (major) requirements:

| | *Credits* |
|---|---|
| Engl. 111—Methods of Written Comm | 3 |
| Engl. 211—Intermed. Exposition with Modes of Literature | |
| *or* Engl. 213—Intermed. Exposition | 3 |
| Chem. 105—General Chemistry | |
| *or* Chem. 211—Chemical Principles | 4 |
| Chem. 106—General Chemistry | |
| *or* Chem. 212—Introductory Quantitative Analysis | 4 |
| Foreign Language | 6 |
| Geol. 111—Physical Geology | 4 |
| Geol. 112—Historical Geology | 4 |
| Geol. 213—Mineralogy | 4 |
| Geol. 214—Petrology | 3 |
| Geol. 304—Geomorphology | 3 |
| Geol. 314—Structural Geology | 3 |
| Geol. 315—Optical Mineralogy | 3 |
| Geol. 316—Petrography | 3 |
| Geol. 321—Principles of Sedimentation | 3 |
| Geol. 350—Geologic Field Methods | 2 |
| Geol. 351—Field Geology | 6 |
| Geol. 401—Invertebrate Paleontology | 4 |
| Geol. 402—Stratigraphic Paleontology | 3 |

**Geol. 417—Introduction to Geochemistry.....3
Geol. 418—Introduction to Geophysics.....3
Math. 200-201-202—Calculus and Math. 302—Differential Equations
*or* Math. 200-201—Calculus; Math. 203—Finite Math; and A.S. 301—Elementary Probability and Statistics.....15
Min. 202—Mine Surveying
*or* C.E. 112—Elementary Surveying.....3
Phys. 105-106—University Physics
*or* Phys. 211-212—General Physics.....8
Social Science and Humanities electives.....9
Speech Communication elective.....3
†Professional electives.....15
Electives.....12

### Suggested Curriculum

**First Year**

*Fall Semester* — *15 Credits*
Chem. 105—General Chemistry
*or* Chem. 211—Chemical Principles.....4
Engl. 111—Methods of Written Comm.....3
Geol. 111—Physical Geology.....4
Math. 200—Calculus
*or* Math. 203—Finite Math.....4

*Spring Semester* — *15 Credits*
Geol. 112—Historical Geology.....4
Chem. 106—General Chemistry
*or* Chem. 212—Intro. Quantitative Analysis.....4
Engl. 211—Intermed. Exposition with Modes of Literature
*or* Engl. 213—Intermed. Exposition.....3
Math. 201—Calculus.....4

**Second Year**

*Fall Semester* — *18 Credits*
Geol. 213—Mineralogy.....4
Math. 202—Calculus
*or* Math. 203—Finite Math.....4
Phys. 105—University Physics
*or* Phys. 211—General Physics.....4
Social Science or Humanities elective.....3
Speech Communication elective.....3

*Spring Semester* — *17 Credits*
Geol. 214—Petrology.....3
Math. 302—Differential Equations
*or* A.S. 301—Elem. Probability & Statistics.....3
Min. 202—Mine Surveying
*or* C.E. 112—Elementary Surveying.....3
Phys. 106—University Physics
*or* Phys. 212—General Physics.....4
Elective.....4

**Third Year**

*Fall Semester* — *15 or 16 Credits*
††Biol. 107-108—Fundamentals of Biology.....4
Geol. 315—Optical Mineralogy.....3
Geol. 321—Principles of Sedimentation.....3
Geol. 304—Geomorphology.....3
Foreign Language Reading Ability.....3

*Spring Semester* — *17 Credits*
Geol. 316—Petrography.....3
Geol. 314—Structural Geology.....3
Geol. 350—Geologic Field Methods.....2
Foreign Language Reading Ability.....3
Social Science or Humanities elective.....3
Electives.....3

*Summer* — *6 Credits*
Geol. 351—Field Geology (6 Weeks).....6

**Fourth Year**

*Fall Semester* — *16 Credits*
Geol. 401—Invertebrate Paleontology.....4
††Geol. 403—Environmental Geology.....3
Geol. 417—Introduction to Geochemistry.....3
††Geol. 421—Principles of Seismology.....3
Social Science or Humanities elective.....3

*Spring Semester* — *16 Credits*
††Geol. 362—Engineering Geology.....3
Geol. 402—Stratigraphic Paleontology.....3
Geol. 418—Introduction to Geophysics.....3
††Geol. 430—Computer Applications Geol.....2
Elective.....5

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

**Majors may elect to substitute Chem. 331 for Geol. 417.

†Approved courses in geology, mathematics, chemistry, physics, or the engineering sciences.

††Suggested Professional Electives:
Biol. 107-108—Fundamentals of Biology
Biol. 305—Invertebrate Zoology
Chem. 331-332—Physical Chemistry
Chem. 333-334—Physical Chemistry Lab
C.E. 334—Water Resources Engineering
C.E. 412—Elements of Photogrammetry
C.E. 422—Foundation Engineering
C.E. 435—Soil Mechanics
Econ. 121—Principles of Economics (Social Science elective)
E.S. 201—Computer Techniques
E.S.M. 450—Engineering Management and Operations
Geol.—All courses
Math. 312—Numerical Methods for Engineers
M.Pr. 313—Introduction to Mineral Preparation
M.Pr. 418—Emission, Spectroscopy, X-Ray Diffraction, Atomic Absorption, and Electron Microscopy

Min. 408—Mineral Valuation and Economics
Phys. 311-312—Classical Physics
Phys. 351—Introduction to Dynamic Meteorology
Phys. 465—Meteorology

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

**Geology—M.S. Degree**

**1.** Complete the general University requirements and master's degree requirements, pages 27 and 29-30.
**2.** Complete a minimum of 30 credits, including a maximum of 12 credits in Geol. 693-694, Special Topics, and Geol. 699, Thesis.
**3.** Complete at least one course from each of the three core areas — Structural Geology, Advanced Petrology, and Advanced Stratigraphy.

**Geology—Ph.D.**

**1.** Complete the general University requirements and Ph.D. requirements, pages 27 and 30.
**2.** Complete required program as arranged by conference with graduate advisory committee.

## HEALTH, PHYSICAL EDUCATION AND RECREATION

*College of Behavioral Sciences and Education*

**Degrees:** Bachelor of Arts, Bachelor of Science
**Minimum Requirements for Degrees:** 130 Credits

The curriculum in physical education serves three purposes: (1) to provide students with an interest-area major, (2) to prepare qualified students to teach physical education, coach athletic teams, and direct recreational programs according to the needs of the State of Alaska, and (3) to prepare students for future enrollment in graduate physical education programs in Alaska or other states. Those students who do wish to teach physical education in the State of Alaska must satisfy the requirements for an Alaska teaching certificate by taking appropriate courses in the Department of Education.

**Physical Education—B.A. or B.S. Degree**

**1.** Complete the general University requirements and B.A. or B.S. degree requirements as listed on pages 27-9.
**2.** Complete the following program (major) requirements:

A. Complete 36 credits in Physical Education, as follows:

| Required courses (27-30 credits): | *Credits* |
|---|---|
| P.E. 201—Introduction to Health, Physical Education & Recreation | 2 |
| P.E. 246—First Aid | |
| *or* P.E. 440—Prevention & Care of Athletic Injuries | 2 |
| P.E. 303—Techniques in Physical Education—Team Sports | 2 |
| P.E. 305—Techniques in Physical Education—Individual & Dual Sports & Activities | 2 |
| P.E./Ed. 308—Physical Education for the Elementary School | 3 |
| P.E. 311—History and Principles of Physical Education | 3 |
| P.E. 400—Techniques in Physical Education—Tumbling & Gymnastics | 2 |
| P.E./Ed. 406—Methods of Teaching Physical Education (may count as Ed. credit) | 3 |
| P.E. 413—Techniques in Physical Education—Physical Conditioning & Fitness | 2 |
| P.E. 421—Physiology of Exercise | 3 |
| P.E. 425—Organization & Administration of Physical Education | 3 |
| P.E. 432—Biomechanics of Exercise and Sports | 3 |
| Two courses (4 credits) required from: | |
| P.E. 302—Techniques in Physical Education—Track & Field | 2 |
| P.E. 304—Techniques in Physical Education—Winter Sports | 2 |
| P.E. 408—Techniques in Physical Education—Aquatics | 2 |
| P.E. 410—Techniques in Physical Education—Rhythms | 2 |
| Courses selected from list below to total 36 credits in P.E.: | |
| P.E. 242—Personal & Community Health | 3 |
| P.E. 246 or 440 (see required courses) | 2 |
| P.E. 301—Theory of Coaching Basketball | 2 |
| P.E. 321—Practicum in Physical Education (maximum 4 credits) | 1 |
| P.E. 331—Sports Officiating | 2 |
| P.E. 332—Intramural Sports | 2 |
| P.E. 302, 304, 408, 410 (two not used to complete 2-course requirement above) | 2-4 |

B. Demonstrate performance - and - knowledge competency in each of the areas listed below. Requirements are available in the department office. (Proficiency is to be obtained individually or by participation in P.E. 100 courses. P.E. 100 credits will not apply toward the major.)
Physical Fitness
Team Sports
Individual and Dual Sports and Activities
Tumbling and Gymnastics
Aquatics
Rhythms

C. Complete the following:
Biol. 107-108, 201, 210, Chem. 104 or 105 or equivalent.

D. Complete a minor area of study.

NOTE: To qualify for a State of Alaska teaching certificate, with a Physical Education major, the student must complete the following Education courses (and their prerequisites): Education 313, 314, 332, 408, 421 or approved elective, and Ed. 452.

**For a minor in Physical Education in one of the following degree programs, consult with Physical Education Department Head:**
1. B.A. or B.S. Degree—18 credits
2. B.Ed. Degree, Secondary Education—18 credits
3. B.Ed. Degree, Elementary Education—12-24 credits

## HEALTH SCIENCES, PREPROFESSIONAL CURRICULA

Professional schools of medicine and dentistry as well as many of the professional schools in paramedical fields (e.g., nursing, physical therapy) require one to three or four years of collegiate work before a student will be admitted. These years of preliminary academic work may be taken at the University of Alaska, where the student follows a sequence of courses planned to meet the requirements of the particular professional field in which he is interested. Students interested in health professions should contact the Health Sciences Preprofessional Advisor, College of Biological Sciences and Renewable Resources, before registering.

Most premedical students plan on four preliminary years. The student is encouraged to develop his major area of interest, be it in natural or social sciences or in the humanities, but in preparation for medical school he must gain a thorough understanding of the modern concepts in biology, chemistry, and physics. He is encouraged to include chemistry and physics or biology in his freshman course of study. Usually, students at the University of Alaska follow a curriculum leading to a Bachelor of Arts degree with a major in biological sciences and/or chemistry or a curriculum leading to a Bachelor of Science degree with a major in biological sciences or chemistry, earning a bachelor's degree at the end of four years. Adjustments may be made to meet varying requirements. Premedical students who are accepted in medical school prior to finishing their degree and who wish to receive a baccalaureate degree from the University of Alaska may obtain from the Dean, College of Biological Sciences and Renewable Resources, a description of the requirements which must be completed.

### Washington, Alaska, Montana, and Idaho Experimental Medical Extension Program (WAMI)

In September 1971 the University of Alaska started an experimental collaborative program with the University of Washington School of Medicine under financial support of the Commonwealth Foundation of New York. Additional support was obtained from the Bureau of Health Resources Development (Department of Health, Education and Welfare) to expand the program in other WAMI states. The first three years of the program provided one semester of instruction (approximately 22 semester credits) in Fairbanks. Beginning with the fall semester in 1974, the program will be two semesters (the entire freshman year of medical school, approximately 40 semester credits). Students formally enrolled in the WAMI program must have been admitted to the freshman class of the University of Washington School of Medicine in Seattle as candidates for the doctoral degree in medicine and are, therefore, concurrently enrolled in both universities. Students will complete course offerings in Alaska and then return to Seattle until their junior or senior year, when they become eligible for community based clinical clerkships with practicing physicians in one of the four WAMI states. This attempt to decentralize portions of both the basic science (freshman and sophomore) and clinical (primarily junior and senior) years of medical education is designed to encourage physicians to consider practice in smaller communities and also to increase the chances of admission to the University of Washington School of Medicine for Alaska residents.

The Medical Sciences courses listed are taught at an advanced level (graduate equivalent) and are intended primarily for WAMI students who will receive additional tutorial instruction from the faculty. However, most of the courses are also open to qualified undergraduate and graduate students in good standing, subject to permission of the instructor.

Modest financial support may be available to WAMI students during their stay at the University of Alaska, and those WAMI students establishing Alaskan residence are eligible for tuition support under a program of the Western Interstate Commission on Higher Education (WICHE) while studying at the University of Washington School of Medicine.

Further information about WAMI may be obtained from the Coordinator of the WAMI Program. Information concerning admission to medical school may be obtained from the WAMI Coordinator or the Premedical Advisor, University of Alaska.

## HISTORY

*College of Business, Economics and Government*

**Degrees:** Bachelor of Arts, Master of Arts, Master of Arts in Teaching

**Minimum Requirements for Degrees:** B.A.—130 Credits; M.A.—30 Additional Credits; M.A.T.—30 Additional Credits.

The History Department seeks to make the student aware of the cultural heritage of

40 - 72 long.



mankind, the great problems that man has faced throughout history and how he has sought to solve them.

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

V.H.

**History—B.A. Degree**

**1.** Complete general University and B.A. degree requirements, pages 27-9.

**2.** Complete the following program (major) requirements:

Complete any four of the following:

| | *Credits* |
|---|---|
| Hist. 101-102—Western Civilization | 6 |
| Hist. 121-122—East Asian Civilization | 6 |
| Hist. 131-132—History of the U.S. | 6 |

Complete 21 upper division credits in history, including:

| | |
|---|---|
| Hist. 475-476—Historiography and Intro. to Historical Method | 6 |

**A minor in History requires 12 credits of History electives beyond Hist. 101 and 102 or Hist. 121 and 122, six of which must be above the 100 level.**

**History—M.A. Degree**

**1.** Complete the general University requirements and master's degree requirements, pages 27 and 29-30.

**2.** Complete a minimum of 30 semester hours of courses in history and other fields as determined by the candidate's graduate committee. The courses must include Hist. 475-476—Historiography and Historical Method, Hist. 691, Seminar in European History, and Hist. 692, Seminar in American History.

**3.** Complete a satisfactory thesis for which six credit hours may be granted, or two publishable seminar papers (contact departmental chairman).

**4.** Successfully complete comprehensive examinations in two fields of history as determined by the candidate's graduate committee.

**5.** Pass an oral examination on the thesis and general field of history.

**History—M.A.T. Degree**

Refer to general requirements for M.A.T. degree on page 84. Persons interested in this degree program should contact the head of the department.

## HOME ECONOMICS

*College of Behavioral Sciences and Education*

**Degree:** Associate in Arts, Bachelor of Science
**Minimum Requirements for Degree:**
A.A.—60 Credits; B.S.—130 Credits

The home economics curriculum stresses the development of competencies necessary to a professional home economist with special emphasis on home economics education. In addition to providing a background for service in home economics careers, provision is made for the liberal education of the student as a person, a citizen, and a family member through the selection of courses in the social and natural sciences, the humanities, and the arts.

V.H.

**Early Childhood Development—A.A. Degree**

**1.** Complete the general University requirements as listed on page 27.

**2.** Complete the following degree and program (major) requirements:

| | *Credits* |
|---|---|
| Engl. 111 and 211 or 213, *or* Engl. 67 and 68 | 6 |
| Sp.C. 111 | 3 |
| Social Sciences—Psy. 101 *and* Soc. 101 *or* Anth. 101 | 6 |
| At least 6 credits in any 2 of the following areas | 12 |
| Natural Science | |
| Humanities | |
| Other academic areas | |
| Major Requirements: | |
| H.E. 105—Survey of Child Development Center Models | 3 |
| H.E. 120—Child Nutrition and Health | 3 |
| Psy. 244—Early Childhood Development | 3 |
| H.E. 155—Activities for Young Children | 3 |
| H.E. 236—Marriage and Family Life *or* Soc. 242—The Family | 3 |
| H.E. 250-251—Practicum in Early Childhood Development *or* B.S. 101-201—Field Observation, Field Pract | 6 |
| B.S. 220—Culture and Learning | 3 |
| Electives | 9 |

**Home Economics—B.S. Degree**

**1.** Complete the general University requirements as listed on page 27.

**2.** Complete the following degree and program (major) requirements:

**First Year**

| *Fall Semester* | *17 Credits* |
|---|---|
| Engl. 111—Methods of Written Comm | 3 |
| Biol. 107-108—Fund. of Biology | 4 |
| Math. 106 | 5 |
| H.E. 113—Cloth Constr. & Selection I | 3 |
| *Elective | 2 |

| *Spring Semester* | *15 or 16 Credits* |
|---|---|
| Sp.C. 111—Fund. of Oral Comm | 3 |
| Biology Elective | 4 |
| Math. 200 or 203 or A.S. 301 | 3 or 4 |
| H.E. 102—Meal Management | 3 |
| *Elective | 2 |

**Second Year**

| *Fall Semester* | *16 Credits* |
|---|---|
| Engl. 211—Intermed. Exposition with Modes of Literature *or* Engl. 213—Intermed. Exposition | 3 |

Chem. 103—Contemporary Chemistry
*or* Chem. 105—General Chemistry .....4
H.E. 231—Interior Design .....3
H.E. 241—Home Management .....3
Psy. 101—Intro. to Psychology .....3

*Spring Semester* *16 Credits*
*Elective .....3
Chem. 104—Contemporary Chemistry
*or* Chem. 106—General Chemistry .....4
H.E. 211—Textiles .....3
H.E. 236—Marriage & Family Life .....3
Soc. 101—Intro. to Sociology .....3

**Third Year**
*Fall Semester* *17 Credits*
H.E. 312—Cloth. Const. & Selection II .....3
H.E. 304—Nutrition .....3
Econ. 121—Principles of Economics .....3
*Electives .....8

*Spring Semester* *17 Credits*
H.E. 245—Child Development .....3
H.E. 302—Experimental Foods .....3
*Electives .....11

**Fourth Year**
*Fall Semester* *17 Credits*
H.E. 441—Family Health .....3
H.E. 401—Consumer Education .....3
*Electives .....11

*Spring Semester* *15 Credits*
H.E. 442—Household Equipment .....3
*Electives .....12

A minor is not required for the B.S. degree with a major in Home Economics.
*All electives must be approved by the head of the department and must include 3 credits in Humanities electives and 3 credits in Social Science electives.

**A minor in Home Economics requires completion of the following:**

*Credits*
H.E. 102—Meal Management .....3
H.E. 113—Clothing Construction and Selec I .....3
H.E. 236—Marriage and Family Life .....3
H.E. 241—Home Management .....3
H.E. 245—Child Development .....3
plus 3 hours from the following:
H.E. 304—Nutrition .....3
H.E. 401—Consumer Education .....3
H.E. 441—Family Health .....3
H.E. 442—Household Equipment .....3

**Teaching Certificates**—Home economics graduates may qualify for teaching vocational home economics. They may obtain an Alaskan teaching certificate by completing Ed. 407, Methods of Teaching Home Economics, and meeting the other requirements of the State Department of Education.

## HUMANITIES

*College of Arts and Letters*

**Degree:** Bachelor of Arts
**Minimum Requirements for Degree:**
130 Credits

The humanities encompass all cultural phenomena as related to Man, the creator of the arts, of theological, philosophical, and scientific systems, and of technological achievements and social structures. A systematic investigation of the humanities shows that there is unity beneath the obvious variety of disciplines or historical developments.

In the humanities core courses, much emphasis is laid on this concept of units. One main objective of the program is to enable the student to go beyond specialization and achieve integration of knowledge. Others are to deepen his appreciation of all the arts, to develop his critical thinking, and to heighten his awareness of his own self and his role in society.

The humanities program is set up in such a way as to offer a solid second major for many B.A. and B.S. degree candidates. It aims at students from virtually all fields of specialization.

**Humanities—B.A. Degree**
**1.** Complete the general University requirements and B.A. degree requirements, pages 27-9.
**2.** Complete the following program (major) requirements:

Prerequisites: *12 Credits*
Hist. 101-102—Western Civilization .....6
Ling. 101—The Nature of Language
*or* Ling. 112—The Structure of Language .....3
Phil. 201—Introduction to Philosophy
*or* Phil. 202—Introduction to Eastern Philosophy .....3

Core Courses: *24 Credits*
Hum. 201—Unity in the Arts .....3
Hum. 202—Unity in the Sciences .....3
Hum. 329—The Modern Media .....3
Hum. 332—Varieties of Visual Expression .....3
Hum. 342—Synthesis in Musical Expression .....3
Hum. 411—Dimensions of Literature .....3
Phil. 481—Philosophy of Science .....3
Hum. 492—Senior Seminar .....3

Electives *21 Credits*
Courses chosen from the three major areas: Arts, Natural Sciences, Social Sciences; three courses to be taken in one of these areas, and two in each of the remaining ones, totaling 21 credits. A list of

recommended courses, drawn up and periodically updated by the Humanities Standing Committee after consultation with all departments in all colleges that wish to cooperate, will assist the student in making the choice of electives.

**Minor In Humanities**

| | |
|---|---|
| Prerequisites | *6 Credits* |
| Hist. 101-102—Western Civilization | 6 |
| Core Courses | *18 Credits* |
| Hum. 201—Unity in the Arts | 3 |
| Hum. 202—Unity in the Sciences | 3 |
| Upper-division Humanities electives | 12 |

## INTERDISCIPLINARY STUDIES

**Degrees:** Bachelor of Arts, Bachelor of Science

**Minimum Requirements for Degrees:**
B.A.—130 Credits; B.S.—130 Credits

The exceptional student with well-defined goals which do not fit into the established baccalaureate program of the University should have an opportunity to achieve baccalaureate recognition for carrying out an approved interdisciplinary program which approximates the requirements for a baccalaureate degree in an established discipline. For this purpose the B.A. or B.S. degree in Interdisciplinary Studies is offered.

Upon completion of 15 credit hours, which must be within the specific region of the University of Alaska in which the student will continue his study, and at least 60 hours prior to graduation, a student may submit to the appropriate Provost or his designated representative an interdisciplinary curriculum leading to a B.A. or B.S. degree in Interdisciplinary Studies to be taken at a baccalaureate degree granting campus of that region. The proposed curriculum must differ significantly from established degree programs in the University of Alaska system and will require evidence that the necessary facilities and faculty are available at that campus to ensure an approximation of a normal baccalaureate degree. All general requirements for the B.A. or B.S. degree must be met. The proposal may include studies elsewhere and a suggested program director and advisory committee.

The Provost will appoint to review the proposal a committee of at least three faculty members familiar with the suggested campus and interdisciplinary subject. If the curriculum is approved by the Provost, he will, in consultation with the student, appoint an advisory committee of at least three faculty members to assist the student in planning and carrying out his program. The degree title will be chosen by the advisory committee in concert with the student and with the approval of the Provost. Changes within the approved curriculum would be made only with the approval of this advisory committee. The curriculum will not be transferable to other campuses, and it is expected that a student considering this program will thoroughly investigate the strengths and capabilities of the campus at which he plans to undertake the interdisciplinary studies.

## JOURNALISM

*College of Arts and Letters*

**Degree:** Bachelor of Arts

**Minimum Requirements for Degree:**
130 Credits

The journalism curriculum is designed to prepare students for a challenging profession which calls for a high degree of proficiency in communicating with words and pictures—while being versatile enough to allow a broad general education.

Students with diverse interests frequently find that journalism fits well into a joint educational program with many other fields.

**Journalism—B.A. Degree**

1. Complete the general University requirements and B.A. degree requirements as stated on pages 27-9.
2. Complete the following program (major) requirements:

A. Complete at least 29 and no more than 35 credit hours in journalism.
B. Complete the following courses in journalism:

| | *Credits* |
|---|---|
| Jour. 101—Introduction to Journalism | 2 |
| Jour. 201—Newswriting | 3 |
| Jour. 203—Basic Photography | 3 |
| Jour. 212—Editing | 3 |
| Jour. 413—Law of the Press | 3 |

C. Complete one of the following options:
1. News-Editorial Journalism Option.

| | |
|---|---|
| Jour. 301—Reporting | 3 |
| Jour. 320—Journalism in Perspective | 3 |

Jour. 412—Advanced Editing ..... 3
One additional course in writing or editing ..... 3
One of the following:
Jour. 324—Typography & Pub. Design ..... 2
Jour. 326—Principles of Advertising ..... 3

2. Photojournalism Option.
Jour. 303—Advanced Photography ..... 3
Jour. 324—Public. Design & Typography ..... 2
One of the following:
Brd. 217—Writing for Radio-TV ..... 3
Jour. 301—Reporting ..... 3
Jour. 311—Magazine Article Writing ..... 3
Two of the following:
Brd. 216—Television Production ..... 3
Jour. 320—Journalism in Perspective ..... 3
Jour. 403—Cinematography ..... 3
Jour. 323—Magazine Editing ..... 2
Jour. 424—Magazine Production ..... 3

3. Magazine Journalism Option.
Jour. 311—Magazine Article Writing ..... 3
Jour. 411—Advanced Mag. Article Writing ..... 3
Jour. 323—Magazine Editing ..... 2
Jour. 424—Magazine Production ..... 3
One of the following:
Jour. 324—Typography & Pub. Design ..... 2
Jour. 326—Principles of Advertising ..... 3

4. Broadcast Journalism Option.
Jour. 301—Reporting ..... 3
Brd. 341—Radio-TV News ..... 3
Jour. 403—Cinematography ..... 3
Two of the following:
Brd. 215—Radio Production ..... 3
Brd. 216—Television Production ..... 3
Brd. 217—Writing for Radio-TV ..... 3
One of the following:
Jour. 311—Magazine Article Writing ..... 3
Jour. 320—Journalism in Perspective ..... 3
Jour. 401—Reporting Public Affairs ..... 3
Broadcast electives ..... 5-9

5. Advertising Option.
Jour. 324—Typography & Pub. Design ..... 2
Jour. 326—Principles of Advertising ..... 3
Brd. 215—Radio Production ..... 3
Brd. 217—Writing for Radio-TV ..... 3
Brd. 331—Radio-TV Advertising ..... 3
B.A. 243—Principles of Marketing ..... 3
Jour. 424—Magazine Production ..... 3

D. Complete at least three credits in each of the following areas:
Economics
Political Science
Psychology
Sociology
A laboratory science

**Requirements for a Minor in Journalism**

Complete at least 14 credits in journalism including the following:

| | *Credits* |
|---|---|
| Jour. 101—Introduction to Journalism | 2 |
| Jour. 201—News Writing | 3 |
| Jour. 203—Basic Photography | 3 |
| Jour. 212—Editing | 3 |

## LAND RESOURCES AND AGRICULTURAL SCIENCE

*College of Biological Sciences and Renewable Resources*

The undergraduate curriculum for the first two years is designed to provide the basic science foundation on which advanced courses are based. The curriculum is intended for students who expect to prepare for careers in wildland utilization and in agriculture (see also Natural Resources curriculum). A bachelor's degree in Land Resources and/or Agricultural Science is not available at the University of Alaska.

**Undergraduate Curriculum**

**First Year**

| *Fall Semester* | *17 Credits* |
|---|---|
| Engl. 111 —Written Communication | 3 |
| Biol. 107-108—Fund. of Biology | 4 |
| Chem. 105—General Chemistry | 4 |
| Mathematics | 4 |
| Electives | 2 |

| *Spring Semester* | *17 Credits* |
|---|---|
| Chem. 106—General Chemistry | 4 |
| Mathematics | 4 |
| Biology elective or L.R. 101 | 3 |
| Social Science elective | 3 |
| Elective | 3 |

**Second Year**

| *Fall Semester* | *17 Credits* |
|---|---|
| Phys. 103—College Physics | 4 |
| Geol. 101—Gen. Geology | 4 |
| Econ. 121—Principles of Economics | 3 |
| Engl. 211 or 213 | 3 |
| Elective | 3 |

| *Spring Semester* | *16 Credits* |
|---|---|
| Phys. 104—College Physics | 4 |
| *Approved elective | 3 |
| English elective | 3 |
| Social Science elective | 3 |
| Elective | 3 |

*Biology, Land Resources, Agriculture, or Wildlife.

**Graduate Study in Land Resources**

A program of graduate study in land resources is offered through the University's interdisciplinary graduate program. Personnel from various units of the University community participate in orientating individual studies toward M.S. and interdisciplinary Ph.D. degrees. Areas include forestry, watershed, range, land use, soils, water relations, agronomy, and other aspects of natural resources sciences and agriculture. Students interested in graduate work should write to the head, Department of Land Resources and Agricultural Sciences, outlining their area of interest and study objectives and academic background. Results from the Graduate Record Examination should be provided for the formal application.

## LIBERAL ARTS

*College of Arts and Letters*

**Degree:** Associate in Arts in Liberal Arts
**Minimum Requirements for Degree:**
60 Credits

**Liberal Arts—A.A. Degree**

1. Complete the general University requirements as listed on page 27.
2. Complete the following degree and program (major) requirements:

| | *Credits* |
|---|---|
| Engl. 111 and 211 or 213 | 6 |
| Oral Communication | 3 |
| At least six credits in each three areas below: | 18 |
| Humanities | |
| Social Studies | |
| Natural Science | |
| Mathematics | |
| Other | |

**Major in Liberal Arts**

No course used to meet the above requirements may be used to meet the requirements of the major.

| | |
|---|---|
| A. Specific Requirements | 20-30 |
| One year of foreign language | 6-10 |
| *or* Two years of one foreign language in high school. | |
| Speech (Oral Communication) | 3 |
| Formal Humanities course | 4-6 |
| Hist. 101-102—Western Civilization, *or* Hist. 121-122—East Asian Civilization, *or* Hist. 131-132—History of the U.S., *or* P.S. 101-102—American Government | 6 |
| B. Approved electives (six credits must be in one department) | to total 60 |

## LINGUISTICS AND FOREIGN LANGUAGES

*College of Arts and Letters*
*(See also Alaska Native Languages)*

**Degree:** Bachelor of Arts
**Minimum Requirements for Degree:**
B.A.—130 Credits

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

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

**Foreign Language—B.A. Degree**

1. Complete the general University requirements and B.A. degree requirements, pages 27-9.
2. Complete the following program (major) requirements:
   Complete 28 credits beyond first year in the major language.
   Complete three credits in a linguistics course.

**A minor in a foreign language requires 12-21 credits. If all are at the 200 level or higher, 12 credits will fulfill this requirement.**

**Linguistics—B.A. Degree**

1. Complete the general University requirements and B.A. degree requirements, pages 27-9.
2. Complete the following program (major) requirements:
   Complete 12-16 credits in each of two foreign languages; 12 credits in each foreign language will fulfill the requirement if all are at the 200-level or higher.
   Complete 15 credits in linguistics courses.

**A minor in Linguistics requires 12 credits in Linguistics.**

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

## MATHEMATICS

*College of Mathematics, Physical Sciences, and Engineering*

**Degrees:** Bachelor of Arts, Bachelor of Science, Master of Arts in Teaching, Master of Science

**Minimum Requirements for Degrees:** B.A.—130 Credits: B.S.—130 Credits; M.A.T.—30 Additional Credits; M.S.—30 Additional Credits.

The number of new fields in which professional mathematicians find employment grows continually. The department offers a variety of programs for students majoring in mathematics. Options exist for those who are planning careers in industry, government, or education.

In addition to the major programs, the department provides a number of service courses for the various units of the University.

### Degree Requirements

In addition to meeting all the general requirements for the specific degree, certain mathematics courses are required by all mathematics majors. All electives must be approved by the Mathematics Department. Students preparing to teach mathematics in secondary schools must take the education courses necessary to obtain an Alaskan Teaching Certificate.

### Mathematics—B.A. or B.S. Degree

1. Complete general University requirements and B.A. or B.S. degree requirements, pages 27-9.
2. Complete the following program (major) requirements:

A. Complete the calculus sequence Math. 200-201-202.
B. Complete 18 approved credits in mathematics at the 300 level or above, at least six of which must be at the 400 level. Of those 18 credits, 12 must be taken while in residence on the Fairbanks campus. For those electing the Secondary Education Option, all 18 credits may be at the 300 level.

**A minor in Mathematics requires completion of Math. 200-201-202 in addition to six approved credits at the 300 level or above.**

### Suggested Curriculum

First Year

| *Fall Semester* | *17 Credits* |
|---|---|
| Math. 200—Calculus | 4 |
| Engl. 111—Methods of Written Comm | 3 |
| Humanities/Social Science elective | 3 |
| Phys. 103—College Physics | 4 |
| Electives | 3 |
| *Spring Semester* | *17 Credits* |
| Math. 201—Calculus | 4 |
| Speech Communications elective | 3 |
| Humanities/Social Science elective | 3 |
| Phys. 104—College Physics | 4 |
| Electives | 3 |

Second Year

| *Fall Semester* | *17 Credits* |
|---|---|
| Math. 202—Calculus | 4 |
| Engl. 211—Intermed. Exposition with Modes of Literature | 3 |
| Humanities/Social Science elective | 3 |
| Natural Science elective | 4 |
| Electives | 3 |
| *Spring Semester* | *16 Credits* |
| Math. 314—Linear Algebra | 3 |
| Humanities/Social Science elective | 6 |
| Natural Science elective | 4 |
| Electives | 3 |

Third Year

| *Fall Semester* | *17 Credits* |
|---|---|
| Math. 303—Intro. to Abstract Algebra | 3 |
| Math. 321—Intermed. Applied Mathematics | 4 |
| Electives | 10 |
| *Spring Semester* | *16 Credits* |
| Math. 304—Topics in Abstract Algebra or Applied Algebra | 3 |
| Math. 324—Advanced Calculus | 3 |
| Electives | 10 |

Fourth Year

| *Fall Semester* | *16 Credits* |
|---|---|
| Math. 403—Intro. to Real Analysis | 3 |
| Electives | 13 |
| *Spring Semester* | *16 Credits* |
| Math. 404—Topics in Analysis or Topology | 3 |
| Electives | 13 |

### Mathematics—M.A.T. Degree

1. Complete the general University requirements and master's degree requirements, pages 27 and 29-30.
2. Complete 30 credits in courses approved by the student's graduate committee.

### Mathematics—M.S. Degree

1. Complete the general University requirements and master's degree requirements, pages 27 and 29-30.
2. Complete 30 credits in courses approved by the student's graduate committee.
3. Complete a final examination, including a demonstration of proficiency in mathematics at the graduate level. The means of such demonstration will be determined by the candidate and his graduate committee.

## MECHANICAL ENGINEERING

*College of Mathematics, Physical Sciences, and Engineering*

**Degrees:** Bachelor of Science, Master of Science

**Minimum Requirements for Degrees:** B.S.—130 Credits; M.S.—30 Additional Credits

Mechanical engineering includes the design of vehicles, engines, heating and power plants, and a wide variety of machines. Special emphasis is placed on transportation, heating, and power-generation systems suited to the environment of Alaska.

Candidates for the Bachelor of Science degree are expected to take the State of Alaska Engineer-in-Training examination during their fourth year of study.

**Mechanical Engineering—B.S. Degree**

**1.** Complete the general University requirements as listed on page 27.

**2.** Complete the following degree and program (major) requirements.

**First Year**

| *Fall Semester* | *16 Credits* |
|---|---|
| Engl. 111—Methods of Written Comm | 3 |
| Math. 200—Calculus | 4 |
| E.S. 101—Graphics | 2 |
| E.S. 111—Engineering Science | 3 |
| Chemistry | 4 |
| *Spring Semester* | *16 Credits* |
| Sp.C. 111—Fund. of Oral Comm | 3 |
| Math. 201—Calculus | 4 |
| E.S. 102—Graphics | 2 |
| Electives | 3 |
| Chemistry | 4 |

**Second Year**

| *Fall Semester* | *17 Credits* |
|---|---|
| Physics | 4 |
| Math. 202—Calculus | 4 |
| Humanities/Social Science elective | 3 |
| E.S. 201—Computer Techniques | 3 |
| Engl. 213—Intermediate Exposition | 3 |
| *Spring Semester* | *17 Credits* |
| Math. 302—Differential Equations | 3 |
| Physics | 4 |
| E.S. 208—Mechanics | 4 |
| Metallurgy elective | 3 |
| Humanities/Social Science elective | 3 |

**Third Year**

| *Fall Semester* | *17 Credits* |
|---|---|
| E.S. 301—Engineering Analysis | 3 |
| E.S. 331—Mech. of Materials | 3 |
| E.S. 341—Fluid Mechanics | 4 |
| E.S. 307—Elements of Elect. Engr. | 4 |
| Humanities/Social Science elective | 3 |
| *Spring Semester* | *16 Credits* |
| M.E. 321—Industrial Processes | 3 |
| E.S. 346—Thermodynamics | 3 |
| E.S. 308—Instrumentation | 3 |
| Humanities/Social Science elective | 3 |
| M.E. 302—Mechanisms | 4 |

**Fourth Year**

| *Fall Semester* | *16 Credits* |
|---|---|
| M.E. 401—Stress Analysis | 3 |
| M.E. 413—M.E. Thermodynamics | 4 |
| M.E. 441—Mass & Energy Transfer | 3 |
| Elective | 3 |
| Humanities/Social Science elective | 3 |
| *Spring Semester* | *15 Credits* |
| M.E. 497—(Senior Project) | 3 |
| M.E. 402—Vibration | 3 |
| E.S. 450—Management | 3 |
| Electives | 5 |
| M.E. 492—Seminar | 1 |

**Mechanical Engineering—M.S. Degree**

Persons interested in this program should see the head of the department for guidance in selecting a thesis topic.

## MEDICAL TECHNOLOGY

*College of Biological Sciences and Renewable Resources*

**Degree:** Bachelor of Science

**Minimum Requirements for Degree:** 130 Credits

To receive a Bachelor of Science degree in Medical Technology, a student must have six semesters of collegiate training at an accredited college or university, three of which must be at the University of Alaska with a GPA of at least 2.00, and he must fulfill all requirements of the University for the Bachelor of Science degree, plus the basic requirements as set forth by the Registry of Medical Technologists. The student then becomes a candidate to enter an affiliated school of medical technology, and, if accepted, registers for Biol. 401 at the University of Alaska and spends a 12-month internship at the affiliated school.

The University is affiliated with three ASCP-approved nondenominational schools of medical technology—St. Luke's Hospital School of Medical Technology, Spokane, Washington; Tacoma General Hospital School of Medical

Technology, Tacoma, Washington; and the Swedish Hospital School of Medical Technology, Seattle, Washington.

Upon the satisfactory completion of Biol. 401 and the other above-mentioned university requirements, the student is eligible to receive a Bachelor of Science degree from the University of Alaska. He also is eligible to take the registry examination as a medical technologist under standards set by the Board of Registry of the American Society of Clinical Pathologists. Upon registration, the graduate is privileged to add the initials M.T. (ASCP) after his name.

**Medical Technology—B.S. Degree**

**1.** Complete the general University requirements as listed on page 27.

**2.** Complete the following degree and program (major) requirements:

**First Year**

| *Fall Semester* | *16 Credits* |
|---|---|
| Biol. 107-108—Fund. of Biology | 4 |
| Engl. 111—Written Comm | 3 |
| Chem. 105—General Chemistry | 4 |
| Math. 106—College Algebra & Trig | 5 |

| *Spring Semester* | *15 or 17 Credits* |
|---|---|
| Biology elective | 4 |
| Social Sci. elective | 3 |
| Chem. 106—General Chemistry | 4 |
| Math. 200 or 203 or A.S. 301 | 3 or 4 |
| Elective | 1 or 2 |

**Second Year**

| *Fall Semester* | *16 or 18 Credits* |
|---|---|
| Biol. 201—Mammalian Anatomy | 3 |
| *or* Biol. 317—Comp. Anatomy of Vertebrates | 5 |
| Chem. 212—Quantitative Analysis | 4 |
| Social Sci. elective | 3 |
| Elective | 3 |
| Humanities elective | 3 |

| *Spring Semester* | *16 Credits* |
|---|---|
| Biol. 210—General Physiology | 4 |
| Biol. 252—Genetics | 3 |
| Sp.C. elective | 3 |
| Social Science elective | 3 |
| Biol. 242—Intro. Microbiology | 3 |

**Third Year**

| *Fall Semester* | *17 Credits* |
|---|---|
| Biol. 361—Cell Biology | 4 |
| *or* Biol. 343—Gen. Bacteriology | 5 |
| *Approved Chemistry elective | 4 |
| Elective | 2 or 3 |
| Humanities elective | 3 |
| Engl. 211 or 213—Intermediate Exposition | 3 |

| *Spring Semester* | *16 Credits* |
|---|---|
| Biol. elective | 4 |
| Elective | 6 |
| Humanities/Social Sci. elective | 6 |

| **Fourth Year** | *31 or 33 Credits* |
|---|---|
| Biol. 401—Medical Technology | 30 |
| Elective | 1-3 |

*Organic Chemistry recommended.

## MEDICINE

*See Health Sciences, Preprofessional Curricula*

## MILITARY SCIENCE

*College of Behavioral Sciences and Education*

The Army Reserve Officers' Training Program is a cooperative effort contractually agreed to by the Army and the University of Alaska as a means of providing junior officer leadership in the interest of national security. The goal of this cooperative enterprise is the production of well-educated young men with leadership potential for positions within the national defense structure of the United States.

The program of instruction is designed to complement the student's civilian goal of obtaining a baccalaureate degree in a course of study of his own choosing by enabling him to develop those attitudes and understandings that will facilitate transition to military service. The curriculum seeks to establish a base for normal progression in the commissioned officer educational program.

Senior Division ROTC is divided into the basic course for freshmen and sophomores and the advanced course for juniors and seniors.

**Basic Course**—All regularly enrolled, physically fit male students, without previous military service or training, between the ages of 14 and 23 are eligible for the basic course.

**Advanced Course**—Those students who successfully complete the basic course may apply for enrollment in the advanced course. Applicants must be physically qualified, have the approval of their dean, and be selected by the Professor of Military Science. Veterans may be allowed credit for prior federal service in lieu of the basic course for the purpose of admission to the advanced course. A contract is required of all students enrolling in the advanced course.

**Allowance**—Advanced course students receive a subsistence payment monthly which presently amounts to approximately $2,000 for the two-year period.

**Flight Training**—The Army Flight Training Program is offered to Senior Cadets. Successful completion of the course qualifies the student for entry into the Army Aviation Program upon graduation and may qualify the student for a private pilot's license. Necessary texts, flying clothes, cost of lessons, and transportation are furnished by the Department of Military Science.

**Uniforms and Equipment**—Members of the basic and advanced course are furnished uniforms and texts by the Department of Military Science.

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

**Awards**—Awards are made annually at Governor's Day ceremonies for outstanding achievement in the ROTC program, academic excellence, leadership, and various team awards.

**ROTC Rifle Team**—The ROTC Rifle Team competes in matches with both civilian and military rifle teams in the state. Postal matches with other colleges and universities are fired throughout the year. Rifles, targets, ammunition, shooting coats and gloves, and all necessary equipment are furnished by the Military Science Department at no cost to the cadet.

**University of Alaska Rangers**—The Ranger program is designed to permit individual cadets to further develop their leadership and abilities by participating in additional training in more advanced military skills. Training is conducted on-campus and at various military installations in Alaska. As the nature of the work involved is demanding, participation is voluntary.

**Two-Year Program**—A special program of instruction is also conducted for transfer students and others who were unable to take ROTC prior to their last two years in school. Students interested in the program are advised to consult the Professor of Military Science not later than March 1, annually.

**Deferment**—Students may be granted deferment from induction under the terms of the Military Selective Service Act upon enrollment in any Military Science course. Application must be made to the Professor of Military Science.

## MINERAL ENGINEERING

*College of Earth Sciences and Mineral Industry*

**Degrees:** Associate in Mineral and Petroleum Technology, Bachelor of Science, Master of Science, Engineer of Mines

**Minimum Requirements for Degrees:** A.M.P.T.—66 Credits; B.S.—130 Credits; M.S.—30 Additional Credits; °E.M.—Thesis and Five Years of Experience.

The two-year associate degree in mineral and petroleum technology is designed to give technical training as a first undergraduate degree. Upon completion of this program, students are qualified to serve as technicians in mineral, petroleum, and related areas.

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 requires core courses in engineering and humanities, but allows the student the choice of technical electives to develop a major in an area of exploration, mining, or mineral beneficiation.

**Undergraduate Degrees**—The Department of Mineral Engineering offers the Associate Degree in Mineral and Petroleum Technology, Bachelor of Science Degree in Mining Engineering and the Bachelor of Science Degree in Geological Engineering (*See* separate description of this degree under Geological Engineering).

**Graduate Degrees**—The graduate program allows for the awarding of Master of Science Degrees in Mining Engineering and Mineral Preparation Engineering. The curriculum consists of core courses in engineering management with electives in mining engineering or mineral preparation, respectively. University policy pertaining to graduate study leading to a master's degree applies.

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

**Mineral and Petroleum Technology—A.M.P.T. Degree**

**1.** Complete the general University requirements as listed on page 27.

**2.** Complete the following degree and program (major) requirements.

**First Year**

| *Fall Semester* | *17 Credits* |
|---|---|
| Math. 55—Elementary Algebra | 3 |
| M.P.T. 63—Map Reading & Drafting | 2 |
| M.P.T. 65—Science for Technicians | 3 |
| M.P.T. 67—Petroleum I | 3 |
| Soc. Sci. Elective | 3 |
| Engl. 67—Elementary Exposition *or* Engl. 104—Intensive Lang. Development | 3 |

| *Spring Semester* | *16 Credits* |
|---|---|
| M.P.T. 62—Mineralogy & Petrology | 3 |
| M.P.T. 64—Meas. & Mapping | 3 |

M.P.T. 68—Petroleum II .....3
Engl. 68—Elementary Exposition .....3
Min. 102—Mining Engineering Systems.....4

**Second Year**

| *Fall Semester* | *17 Credits* |
|---|---|
| M.P.T. 71—Exploration Methods | 3 |
| E.S. 101—Graphics | 2 |
| M.P.T. 75—Petroleum III | 3 |
| M.P.T. 80—Intro. Min. & Petrol. Econ. | 3 |
| Math. 105—Intermediate Algebra | 3 |
| M.P.T. 69—Geog. & Geol. | 3 |

| *Spring Semester* | *16 Credits* |
|---|---|
| M.P.T. 72—Milling & Metallurgy | 3 |
| M.P.T. 74—Lab Inst. & Control | 3 |
| M.P.T. 76—Petroleum IV | 3 |
| M.P.T. 78—Computer Applications | 3 |
| Technical elective | 3 |
| M.P.T. 82—Field Trip | 1 |

**Mining Engineering—B.S. Degree**

**1.** Complete the general University requirements as listed on page 27.

**2.** Complete the following degree and program (major) requirements.

**First Year**

| *Fall Semester* | *17 Credits* |
|---|---|
| Engl. 111—Methods of Written Comm | 3 |
| Math. 200—Calculus | 4 |
| E.S. 111—Engineering Science | 3 |
| Geol. 111—Physical Geology | 4 |
| Min. 101—Minerals and Man *or* Social Science elective | 3 |

| *Spring Semester* | *16 Credits* |
|---|---|
| Speech Communication elective | 3 |
| Math. 201—Calculus | 4 |
| E.S. 102—Graphics | 2 |
| †Humanities or Social Sci elective | 3 |
| Min. 102—Min. Systems Engr. | 4 |

**Second Year**

| *Fall Semester* | *16 Credits* |
|---|---|
| Math. 202—Calculus | 4 |
| Phys. 211—General Physics | 4 |
| Chem. 211—Chemical Principles | 4 |
| Geol. 213—Mineralogy | 4 |

| *Spring Semester* | *17 Credits* |
|---|---|
| E.S. 201—Computer Techniques | 3 |
| Phys. 212—General Physics | 4 |
| Chem. 212—Intro. Quantitative Analysis | 4 |
| Min. 202—Mine Surveying | 3 |
| Met. 304—Intro. to Metallurgy | 3 |

**Third Year**

| *Fall Semester* | *16 Credits* |
|---|---|
| Econ. 121—Principles of Economics *or* Social Science elective | 3 |
| M.Pr. 313—Intro. to Min. Prep. | 3 |
| E.S. 307—Elem. Elec. Engr. | 4 |
| Math. 302—Differential Equations | 3 |
| ••Technical elective | 3 |

| *Spring Semester* | *16 Credits* |
|---|---|
| E.S. 208—Mechanics | 4 |
| *E.S. 346—Basic Thermodynamics *or* Chem. 331—Physical Chemistry | 3 |
| Engl. 211 or 213 | 3 |
| E.S. 308—Instru. & Measurements | 3 |
| M. Pr. 314—Unit Prep. Proc. | 3 |

**Fourth Year**

| *Fall Semester* | *17 Credits* |
|---|---|
| E.S. 311—Mechanics of Materials | 3 |
| E.S. 341—Fluid Mechanics | 4 |
| ••Technical Elective | 6 |
| †Humanities or Social Sci. elective | 3 |
| Min. 320—Seminar & Senior Field Trip | 1 |

| *Spring Semester* | *16 Credits* |
|---|---|
| Min. 408—Mineral Valuation & Economics | 4 |
| Humanities or Social Sci. electives | 6 |
| ••Technical elective | 3 |
| Min. 406—Mining Plant Engr. | 3 |

*Either E.S. 346 or Chem. 331 is required, depending upon student's field of interest.

••Nine credits of technical electives must be in subject matter relative to the student's field of major interest in the field of exploration, mining, or mineral beneficiation.

†3 credits must be humanities.

A chemistry sequence of Chem. 105-106 and 212 may be selected in place of Chem. 211 and 212 listed above.

**Petroleum Engineering**—Because of recent developments in the petroleum industry in Alaska, the Board of Regents has approved the initiation of a two-year basic program in petroleum engineering at the University of Alaska. Students enrolling in petroleum engineering will normally complete the first two years of basic engineering listed in the mining engineering curriculum. This course of study may be altered to include subject matter in petroleum engineering. Upon satisfactory completion of the two-year curriculum, students may transfer to a university having a petroleum engineering program and complete their course of study without loss of time or credit.

As an alternate, students following the mining option of the Bachelor of Science degree curriculum may elect to take petroleum engineering courses as their technical electives to better prepare themselves for job opportunities in the petroleum industry of Alaska.

Selected subjects in petroleum engineering are currently offered, and it is anticipated that additional courses will be available in the near future.

**Technical Electives—Mineral Preparation Engineering**

| | *Credits* |
|---|---|
| Met. 312—Fire Assaying | 2 |
| M.Pr. 418—Em. Spec. X-Ray and A.A. | 3 |
| M.Pr. 431—Applied Ore Microscopy | 2 |
| M. Pr. 433—Coal Preparation | 3 |
| Min. 333—Mining & Mineral Leasing Law | 2 |

Min. 403—Operations Research .....3
M. Pr. 493 or 494—Special Topics .....3
M. Pr. 406—Materials Handling .....3

**Technical Electives—Mining Engineering**

| | *Credits* |
|---|---|
| Pet. 302—Oil Well Design & Production | 3 |
| Geol. 314—Structural Geology | 3 |
| Min. 333—Mining and Mineral Leasing Law | 2 |
| Min. 401—Rock Mechanics | 3 |
| M.Pr. 406—Materials Handling | 3 |
| Min. 405—Geophys. & Geochem. Explor. | 3 |
| Geol. 404—Economic Geology | 3 |
| Pet. 201—Petrophysics | 3 |

**Technical Electives—Exploration Engineering**

| | *Credits* |
|---|---|
| Geol. 314—Structural Geology | 3 |
| Min. 333—Mining and Mineral Leasing Law | 2 |
| Geol. 417—Introduction to Geochemistry | 3 |
| Geol. 418—Introduction to Geophysics | 3 |
| Geol. 404—Economic Geology | 3 |
| Min. 403—Operations Research | 3 |
| Min. 405—Geophy. & Geochem. | 3 |
| M. Pr. 418—Spec. Em. Spec., X-Ray, A.A. | 3 |
| Min. 493 or 494—Special Topics | 3 |

**Mineral Preparation Engineering—M.S. Degree**

Complete the general University requirements and graduate degree requirements, pages 27 and 29-30.

| *Fall Semester* | *15 Credits* |
|---|---|
| M.Pr. 601—Froth Flotation | 3 |
| M.Pr. 695—Min. Prep. Res. | 3 |
| Min. 621—Adv. Mineral Economics | 3 |
| M.Pr. 699—Thesis | 3 |
| *Elective | 3 |
| *Spring Semester* | *15 Credits* |
| M.Pr. 696—Min. Prep. Res | 3 |
| M.Pr. 606—Plant Design | 3 |
| *Elective | 6 |
| M.Pr. 699—Thesis | 3 |

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

**Mining Engineering—M.S. Degree**

Complete the general University requirements and graduate degree requirements, pages 27 and 29-30

| *Fall Semester* | *15 Credits* |
|---|---|
| M.Pr. 698—Mineral Prep. Research | 3 |
| Min. 621—Adv. Min. Economics | 3 |
| Min. 403—Operations Research | 3 |
| *Approved elective | 3 |
| Min. 699—Thesis | 3 |
| *Spring Semester* | *15 Credits* |
| E.M. 613—Engineering Management | 3 |
| Min. 333—Mining — Min. Leasing Law | 2 |
| *Approved electives | 7 |
| Min. 699—Thesis | 3 |

*Electives will consist of an approved course of study which will prepare the student for one or the other of the fields of mining or exploration.

## MUSIC

*College of Arts and Letters*

**Degrees:** Bachelor of Arts, Bachelor of Music, Master of Arts in Teaching

**Minimum Requirements for Degrees:** B.A.—130 Credits; B.Mus.—130 Credits, M.A.T.—30 Additional Credits

The curriculum is designed to satisfy cultural and professional objectives.

The Bachelor of Arts degree in music is a curriculum planned for those desiring a broad, liberal education with a concentration in music.

The Bachelor of Music degree in Music Education offers thorough preparation in teacher training with sufficient time to develop excellence in performance areas.

The Bachelor of Music in Performance degree offers intensive specialization for those desiring professional training in music—the vocal and instrumental major.

The Master of Arts in Teaching is designed primarily as a functional program for the public school music teacher. Areas of specialization are instrumental, vocal, music supervision, and elementary specialist. The program is determined by the student and his committee.

The various music organizations maintained by the department offer participation experiences for students in all colleges of the University. Music majors will be required to participate in at least one ensemble (Band, Choir, Orchestra, Chorus) each semester they are enrolled, whichever is most appropriate to the student's performance area. Piano majors may receive ensemble credit by performing as accompanists.

Attendance at recitals and concerts provides students with a variety of musical experiences which expand their regular curriculum, therefore, attendance is mandatory for all majors. The minimum number of required performances will be announced by the Music Department office during the first week of each semester. Recital attendance will be a serious consideration

at the time of review for advancement to upper division standing.

At the end of the sophomore year, all music majors must demonstrate a satisfactory level of proficiency of performance in their applied major in order to advance to upper division courses in music. A student may elect to continue study at the 200 level in attempting to pass requirements for admission to upper division study.

A piano proficiency jury examination must be successfully completed by the end of the student's second year in the program. This examination will consist of (1) performance of a recital composition equivalent in difficulty to a Bach two-part invention, or Clementi or Kuhlau sonatina; (2) sight reading of simple church hymn or Bach Chorales; (3) improvisation of a chordal accompaniment to a simple melody; and (4) transposition and harmonization of the same song to another key.

Students who desire to enroll in music theory courses will complete a placement examination and be allowed to enter at their appropriate level.

**Music—B.A. Degree**

1. Complete general University requirements and B.A. degree requirements, pages 27-9.
2. Complete the following program (major) requirements:

Complete 40 credits in Music including:

| | *Credits* |
|---|---|
| Mus. 131-132—Basic Theory | 6 |
| Mus. 221-222—History of Music | 6 |
| Mus. 231-232—Advanced Theory | 6 |
| Mus. 331-332—Form and Analysis | 4 |
| Applied Music, to include 8 credits of private lessons and 8 credits of ensemble participation | 16 |
| Piano proficiency. | |

**Music Education—B.A. Degree**

1. Complete general University requirements and B.A. degree requirements, pages 27-9.
2. Complete the following program (major) requirements: Complete 40 credits in Music including:

| | *Credits* |
|---|---|
| Mus. 131-132—Basic Theory | 6 |
| Mus. 221-222—History of Music | 6 |
| Mus. 231-232—Advanced Theory | 6 |
| Mus. 315—Music Methods and Techniques | 6 |
| Applied Music, to include 6 credits of private lessons and 10 credits of ensemble participation, to include two semesters of a vocal ensemble | 16 |
| Complete a minor in Education, including either Mus. 309, or Mus. 405. | |
| Piano proficiency. | |

**Music—B.M. Degree (Performance)**

1. Complete the general University requirements as listed on page 27.
2. Complete the following degree and program (major) requirements:

| | *Credits* |
|---|---|
| Engl. 111 or equivalent and 211 or 213 | 6 |
| Speech Communications | 3 |
| Arts & Letters/History electives (non-music) | 15 |
| Electives to be selected from two additional colleges | 15 |
| Required Music courses: | |
| Mus. 161-462—Applied Music (Major) | 24 |
| Mus. 131-132—Basic Theory | 6 |
| Mus. 221-222—History of Music | 6 |
| Mus. 231-232—Advanced Theory | 6 |
| Ensembles | 1 per semester |
| Ten credits to be elected from the following courses: | |
| Mus. 331-332—Form and Analysis | 4 |
| Mus. 431—Counterpoint | 3 |
| Mus. 432—Orchestration | 3 |
| Mus. 351 or 352—Conducting | 2 |
| Mus. 493—Lit. of Performance Area | 3-6 |
| Mus. 493—Special Topics | Arr. |
| Piano proficiency | |
| Electives | to bring total credits to 130 credits |

A half recital will be required in the junior year and a full recital in the senior year. The student, in his graduation recital, must demonstrate ability to perform satisfactorily in public a program of artistic merit.

**Music—B.M. Degree**
**(Music Education — Secondary)**

1. Complete the general University requirements as listed on page 27.
2. Complete the following degree and program (major) requirements.

| | *Credits* |
|---|---|
| Engl. 111 or equivalent and 211 or 213 | 6 |
| Speech Communications | 3 |
| Arts & Letters/History electives (non music) | 15 |
| Electives to be selected from two additional colleges; must include Psy. 101 and Psy. 246 | 15 |
| Required Music Courses: | |
| Mus. 161-462—Applied Music (Major) | 14 |
| Mus. 131-132—Basic Theory | 6 |
| Mus. 221-222—History of Music | 6 |
| Mus. 231-232—Advanced Theory | 6 |
| Mus. 315—Music Methods and Techniques | 10 |
| Mus. 331 or 332—Form and Analysis | 2 |
| Mus. 351 or 352—Conducting | 2 |
| Mus. 432—Orchestration | 3 |
| Ensembles | 1 per semester |
| Piano proficiency | |
| Required Education courses: Ed. 313—Educational Psychology | 3 |

Ed. 314—Practicum in Tutoring; Behavior Modification....1
Ed. 332—Test and Measurements....3
Ed. 405—Methods of Teaching Music....3
Ed. 421—Secondary Education....3
Ed. 452—Student Teaching....9
Electives....to bring total credits to 130 credits

**Music—B.M. Degree**
**(Music Education — Elementary)**

1. Complete the general University requirements as listed on page 27.
2. Complete the following degree and program (major) requirements:

Engl. 111 or equivalent and Engl. 211 or 213....6
Speech Communications....3
Arts & Letters/History electives (non-music)....15
Electives to be selected from two additional colleges (must include Psy. 101 and Psy. 245)....15
Required Music courses:
Mus. 161-462—Applied Music (Major)....14
Mus. 131-132—Basic Theory....6
Mus. 221-222—History of Music....6
Mus. 231-232—Advanced Theory....6
Mus. 315—Music Methods and Techniques....10
Mus. 331 or 332—Form and Analysis....2
Mus. 351 or 352—Conducting....2
Mus. 432—Orchestration....3
Ensembles....1 per semester
Piano proficiency
Required Education courses:
Ed. 313—Educational Psychology....3
Ed. 314—Practicum in Tutoring; Behavior Modification....1
Ed. 332—Test and Measurements....3
Ed. 309—Elementary School Music Methods....3
Ed. 409—The Teaching of Reading....3
One elementary school methods course to be elected....3
One course to be selected from the following:
Ed. 304—Literature for Children....3
Ed. 311—Audio-Visual Methods and Materials....3
Ed. 302—Language Arts for Elem Teachers....3
Ed. 452—Student Teaching....9
Electives....to bring the total to 130 credits

**A minor in Music requires 12 hours of Music credits in addition to 6 credits in:**

Music Theory (selected from Mus. 103, 131, 132) .3
Music 123—Music Appreciation
*or* Music 124—Music in World Cultures....3

A minimum of 2 credits must be in large ensembles.

All applied music students are expected to perform in student recitals each semester of study.

## NATURAL RESOURCES

*College of Biological Sciences and Renewable Resources*

**Degree:** Bachelor of Science
**Minimum Requirements for Degree:**
130 Credits

The natural resources curriculum is designed to provide the student with a broad training in the various land resources and their related applied fields (land planning, conservation, watershed management, forestry, outdoor recreation and agriculture) and the sciences basic to these. Programs can be tailored to specific interests of students and can lead toward careers in general resource management, resource communications, conservation education, or several of the individual fields included.

Opportunities for summer employment are available through various state and federal agencies and through the University's Institute of Agricultural Sciences.

**Natural Resources—B.S. Degree**

1. Complete general University requirements and B.S. degree requirements, pages 27 and 29.
2. Complete the following program (major) requirements:

| | *Credits* |
|---|---|
| Biol. 107-108—Fundamentals of Biology | 4 |
| Biol. 271—Principles of Ecology | 3 |
| Chem. 105-106—General Chemistry | 8 |
| Econ. 235—Resource Economics | 3 |
| Geol. 101 or 111—General Geology *or* Physical Geology | 4 |
| L.R. 102-103—Conservation of Nat. Resources | 3 |
| L.R. 311—Soils | 3 |
| L.R. 354—Introduction to the Forest System | 3 |
| L.R. 321—Introduction to Watershed Science | 3 |
| L.R. 491 or 492—Seminar | 1 |
| W.F. 301—Principles of Animal Population Dynamics and Management | 3 |
| L.R. 414—Outdoor Recreation | 3 |

3. Plus at least 12 credits from the following courses in man's environment and/or resources. Approved special topics courses may at times be applied toward this requirement.

| | *Credits* |
|---|---|
| Ocn. 411—General Oceanography | 3 |
| Geol. 304—Geomorphology | 3 |
| Geol. 403—Environmental Geol. | 3 |
| Min. 101—Minerals & Man | 3 |
| Min. 470—Environmental Workshop | 2 |
| Soc. 207—Population & Ecology | 3 |
| Soc. 307—Population Problems | 3 |
| Geog. 327—Cold Lands | 3 |

Geog. 402—Man & Nature .....3
Biol. 476—Animal Ecology .....3
Biol. 474—Plant Ecology .....3
W.F. 430—Fisheries and Their Management .....3
W.F. 417—Forest and Tundra .....2
W.F. 419—Wetlands .....2
W.F. 435—Water Pollution Biol. .....2
Ag. 381—Plant Sciences .....3
Ag. 310—Animal Science .....3

**4.** Plus a minimum of 12 credits in one of the following fields beyond those taken to fulfill numbers 2 and 3 above. These courses are to be selected for their clear pertinence to a cohesive program in resource study and must be approved by the Head of the Department of Land Resources.

Anthropology (cultural)
Economics
Geography
Sociology
Psychology
Business Administration
Political Science
Police Administration
Education
Broadcasting, Journalism
Biological Sciences
Wildlife and Fisheries
Fisheries Biology
Geology
Mining Engineering and Petroleum
Civil Engineering, Engineering Sciences, Environmental Health Engineering

**5.** The total program must include a minimum of 12 credits in the following social sciences: anthropology, economics, sociology, political science, and/or psychology. Courses must include one relating man's culture to his environment, and one dealing with human population characteristics and dynamics.

## NORTHERN STUDIES

*Interdisciplinary Program*

**Degree:** Bachelor of Arts
**Minimum Requirements for Degree:** 130 Credits

The purpose of the Northern Studies program is to give interested students a broader study of the northern region—its environment, peoples, and problems. The major in Northern Studies is a composite and interdisciplinary one. Students must meet the prerequisite requirements set by each department for particular upper division courses.

Members of the Northern Studies Advisory Committee are W. R. Hunt, chairman; Claus M. Naske, John Cook, Donald Lynch, Michael Krauss, Lee Salisbury, Dave Murray, Bonita Neiland, Ron Senungetuk, Charles Keim, Thomas Morehouse, Elbert Rice, and student representatives Edwin Rhoads and Stephen Braund.

**Northern Studies—B.A. Degree**

**1.** Complete general University requirements and B.A. degree requirements pages 27-9.

**2.** Complete the following program (major) requirements:

*Credits*

Anth. 328—Arctic Ethnology .....3
Geog. 327—Cold Lands .....3
Hist. 380—Polar Exploration and its Lit. .....3
L.R. 102-103—Conservation of Nat. Resources .....3

Participate in the following seminar during the junior or senior year:
Hist. 492—Northern Studies Seminar .....3

In addition, the student should take at least one course in each of the following five areas and sufficient other courses in one of the areas to equal a total of 18 credits:

Anthropology:
Anth. 328—Arctic Archaeology .....3
Anth. 329—Peoples of Central & Northern Asia .....3
Anth. 342—Natives of Alaska .....3
Linguistics:
Ling. 381—Structural Linguistics .....3
Ling. 382—Linguistics Analysis .....3
Esk. 201-202—Intermediate Eskimo .....6
Earth Sciences:
Geog. 105—Elements of Physical Geography .....3
Geog. 302—Geography of Alaska .....3
Geog. 306—Geography of the U.S.S.R. .....3
Geog. 316—Pleistocene Geography .....3
Geog. 401—Weather and Climate .....3
Geol. 462—Glacial and Pleistocene Geology .....3
History:
Hist. 354—Canadian History & Lit. to 1867 .....4
Hist. 355—Canadian History & Literature: 1867 to Present .....4
Hist. 341—History of Alaska .....3
Hist. 344—Twentieth Century Russia .....3
Hist. 375—History of the North Pacific .....3
P.S. 263—Alaska Native Politics .....3
Ecology:
Biol. 104—Natural History of Alaska .....3
Biol. 271—Principles of Ecology .....3
W.F. 417—Wildlife Management: Forest & Tundra .....2

With the approval of the committee, students may make substitutions for some of the requirements in these areas by taking such relevant courses as: C.E.

603—Arctic Engineering; Econ. 493/688—Economics of Natural Resources; OCN 683 — Arctic Oceanography; and such other courses as are approved by the committee.

## NURSING

*See Health Sciences, Preprofessional Curricula.*

## OCEANOGRAPHY & OCEAN ENGINEERING PROGRAM

*College of Mathematics, Physical Sciences, and Engineering*

**Degrees:** Master of Science (Interdisciplinary Degree) Doctor of Philosophy (Interdisciplinary Degree).

The purpose of the program in oceanography and ocean engineering is to train ocean engineers at the M.S. level and oceanographers at the M.S. and Ph.D. levels. The program in oceanography and ocean engineering is coordinated by an interdisciplinary committee of the University composed of selected staff members from the academic colleges and research institutes involved in these areas of graduate training.

Graduate students for this program are selected on the basis of their backgrounds and on the basis of the University's capabilities to meet the selected needs of the individual student. Each student's application for admission to graduate study must be approved by an admission committee selected from members of the program's coordinating committee.

Excellent graduate training opportunities in oceanography and ocean engineering are offered by the University through the Institute of Marine Science and the instructional colleges of the University. The Institute of Marine Science has a staff of scientists and engineers actively engaged in oceanographic research work progressing at the Fairbanks campus of the University, at the Marine Station in Seward, and on research vessels at sea. The departments of chemistry, physics, geology, biological sciences, electrical engineering, civil engineering, engineering management, and mathematics contribute academic courses to this program.

At the M.S. level, the program emphasizes ocean-related course work in both the oceanography and ocean engineering areas. However, additional graduate courses are recommended in the area of the student's undergraduate training to assure a high level of competence in his primary subject.

## OFFICE ADMINISTRATION

*College of Business, Economics, and Government*

**Degrees:** Bachelor of Arts, Associate in Office Administration, Certificate in Secretarial Service

**Minimum Requirements for Degrees:** B.A.—130 Credits; A.O.A.—60 Credits; Certificate—30 Credits.

This department offers four courses of study in order to meet the different needs of those who plan to specialize in the field of office operations. (1) an extensive four-year program leading to the degree of Bachelor of Arts with a major in office administration. The objective of the curriculum is to provide the students with the knowledge, skills, and abilities required of the efficient office administrator or executive secretary. (2) a four-year course leading to the degree of Bachelor of Arts with a major in business education. The objective of the curriculum is to prepare young men and women for the teaching of business subjects in the secondary schools. (3) an intensive two-year program in office administration leading to an Associate in Office Administration degree with a major in office administration. (4) a one-year certificate issued after completion of 30 credits with emphasis placed on typewriting, machine transcription, filing, and the English language.

**Office Administration or Business Education — B.A. Degree**

**1.** Complete the general University requirements and B.A. degree requirements, pages 27-9.

**2.** Complete the following program (major) requirements:

| | *Credits* |
|---|---|
| Foundation Courses: | |
| Psy. 101—Introduction to Psychology *or* Soc. 101—Introduction to Sociology | 3 |
| P.S. 101—Introduction to American Govt. and Political Science | 3 |
| Econ. 121-122—Principles of Economics | 6 |
| Econ. 221—Introduction to Statistics for Economics and Business | 3 |
| Math. 110—Mathematics of Finance | 3 |
| Mathematics and/or Natural Science (lab science) electives | 8 |

Complete the following core courses:
O.A. 105-106—Intermediate & Adv. Typewriting .6
O.A. 231—Business Communications .....3
O.A. 203—Office Machines .....3
CIS 101—Intro. to Data Processing & Fortran .....3
Acc. 101-102—Intro. to Accounting .....6
B.A. 325—Financial Management .....3
B.A. 331—Business Law .....3
B.A. 343—Marketing .....3
B.A. 361—Industrial Relations
*or* B.A. 480—Organization Theory .....3

Complete one of the following majors:
A. Office Administration.
O.A. 101-102-201—Beginning, Intermediate and Advanced Shorthand .....11
O.A. 202—Adv. Dictation & Transcription .....4
O.A. 208—Machine Transcription & Filing .....3
O.A. 302—Exec. Secretarial Procedures .....3
Complete a minor complex .....12 or more

B. Business Education — Option 1
O.A. 101-102-201—Beginning, Intermediate and Advanced Shorthand .....11
O.A. 202—Adv. Dictation & Transcription .....4
O.A. 208—Machine Transcription & Filing .....3
O.A. 302—Exec. Secretarial Procedures .....3
Complete a minor in Secondary Education .....25

C. Business Education—Option 2
Acct. 310—Income Tax .....3
Acct. 342—Managerial Cost Accounting .....3
Acct. 311—Intermediate Accounting .....3
Adv. electives from O.A., B.A., Econ., or Acct .....3
Complete a minor in Secondary Education .....25
Complete electives to bring total credits to .....130.

**Office Administration—Associate Degree**

**1.** Complete the general University requirements as listed on page 27.

**2.** Complete the following degree and program (major) requirements:

Acc. 51—Introduction to Accounting I
*or* Acc. 101—Elementary Accounting .....3
Acc. 52—Introduction to Accounting II
*or* Acc. 85—Tax Accounting
*or* Acc. 102—Elementary Accounting .....3
Econ. 51—Introduction to Economics I
*or* Econ. 101—Intro. to Current Economic Problems
*or* Econ. 121—Principles of Economics I .....3
Speech elective .....3

Three credits from the following courses:
Econ. 52—Introduction to Economics II
*or* Econ. 122—Principles of Economics II .....3
P.S. 101—Intro. to American Government and Political Science .....3
B.A. 331—Business Law .....3
Engl. 067—Elementary Exposition
*or* Engl. 111—Methods of Written Comm .....3
Engl. 068—Elementary Exposition
*or* Engl. 211—Intermediate Exposition
*or* Engl. 213—Intermediate Exposition .....3
Soc. 101—Intro. to Sociology
*or* Psy. 101—Intro. to Psychology .....3
Mathematics elective .....3
O.A. 101—Beginning Shorthand .....4
O.A. 102—Intermediate Shorthand .....4
*O.A. 201—Advanced Shorthand .....3
O.A. 202—Adv. Dictation and Transcription .....4
O.A. 103—Elementary Typewriting .....3
O.A. 105—Intermediate Typewriting .....3
O.A. 106—Advanced Typewriting .....3
O.A. 203—Office Machines
*or* O.A. 63—Adding & Calculating Machines .....3
O.A. 208—Machine Transcription and Filing .....3
O.A. 231—Business Communications .....3
O.A. 302—Exec. Secretarial Procedures .....3
Approved electives to bring the total number of credit hours to 60.

A student who has received credit at other institutions for, or who can demonstrate proficiency in O.A. 101, 102, 103, or 105 will not be required to take these courses but must substitute the equivalent number of approved credits.

*O.A. 201 Advanced placement to O.A. 202 with permission of instructor.

**Requirements for One-Year Certificate in Secretarial Service**

| *First Semester* | *Credits* |
|---|---|
| Engl. 111—Methods of Written Comm *or* Engl. 67—Elementary Exposition | 3 |
| Sp.C. 51—Basic Speech Comm Skills | 2 |
| *or* Sp.C. 111—Fundamentals of Oral Comm | 3 |
| O.A. 105—Intermediate Typewriting | 3 |
| O.A. 61—Clerical Skills | 3 |
| O.A. 65—Machine Transcription | 3 |
| *or* O.A. 102—Intermediate Shorthand | 4 |
| O.A. 63—Adding and Calculating Machines | 3 |
| *Second Semester* | *Credits* |
| Engl. 68—Elementary Exposition | 3 |
| O.A. 106—Advanced Typewriting | 3 |
| O.A. 66—Machine Transcription *or* O.A. 201—Advanced Shorthand | 3 |
| O.A. 99—Office Practicum | 6 |

**Requirements for Office Administration Minor**

A minor in Office Administration consists of the following 22 credits:

| | *Credits* |
|---|---|
| O.A. 102—Intermediate Shorthand | 4 |
| O.A. 105—Intermediate Typewriting | 3 |
| O.A. 106—Advanced Typewriting | 3 |
| O.A. 201—Advanced Shorthand | 3 |
| O.A. 231—Business Communications | 3 |
| O.A. 203—Office Machines | 3 |
| O.A. 302—Exec. Secretarial Procedures | 3 |

## PEACE ARTS

*Interdisciplinary Program*

**Degree:** Bachelor of Arts
**Minimum Requirements for Degree:** 130 Credits

This program has been established by the University of Alaska as its contribution toward a more peaceful world. It is designed to prepare students for a professional career in achieving and maintaining peace, while at the same time affording a good liberal arts background to those wishing to pursue other careers. The program is administered by a committee composed of representatives from all participating colleges.

At present students majoring in this program must specialize in the U.S., Europe, the U.S.S.R. or Japan. It is planned to expand the program to include Latin America and the Moslem World.

**Peace Arts—B.A. Degree**

1. Complete general University requirements and B.A. degree requirements, pages 27-9.
2. Complete the following program (major) requirements:

Complete the following core courses:
- P.S. 201-202—Comparative Politics
- P.S. 321-322—International Affairs
- Econ. 121-122—Principles of Economics
- Geog. 405—Political Geography
- Hist. 334—Diplomatic History of the U.S.
- Pc.A. 492—Peace Arts Seminar

Complete the following regional courses (6-22 credits):
- Two years of a foreign language (or receive credit by examination).
- One semester course in history of area in which the language is spoken.
- One semester course in geography of area in which the language is spoken.

Complete 12 credits from the following courses or alternatives approved by the Program Advisor:
- Anth. 202—Cultural Anthropology
- Anth. 203 or 204—World Ethnography
- Econ. 337—Economic Development
- Econ. 423—Comparative Economic Systems
- Econ. 463—International Economics
- Econ. 425—History of Economic Thought
- Geog. 101—Introductory Geography
- Geog. 103—World Economic Geography
- Hist. 101 or 102—Western Civilization
- Hist. 450—Twentieth Century America
- Phil. 484—Philosophy of History
- P.S. 361—Latin American Governments and Politics
- One year of related foreign language at 300 level or above.

## PHILOSOPHY

*College of Arts and Letters*

**Degree:** Bachelor of Arts
**Minimum Requirements for Degree:** 130 Credits.

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

**Philosophy—B.A. Degree**

1. Complete the general University requirements and B.A. degree requirements, pages 27-9.
2. Complete the following program (major) requirements:

Complete a year sequence in mathematics.
Complete 33 credits in Philosophy, including:

| | *Credits* |
|---|---|
| Phil. 201—Introduction to Philosophy | 3 |
| Phil. 202—Introduction to Eastern Philosophy | 3 |
| Phil. 204—Introduction to Logic | 3 |
| Phil. 351-352—History of Philosophy | 6 |
| Phil. 471—Contemporary Philosophical Problems | 3 |
| Phil. 493 or 494—Special Topics | 3 |
| Choose two courses out of the following: | |
| Phil. 321—Aesthetics | 3 |
| Phil. 332—Ethics | 3 |
| Phil. 341—Epistemology | 3 |
| Phil. 342—Metaphysics | 3 |
| Choose two of the following: | |
| Phil. 481—Philosophy of Science | 3 |
| Phil. 482—Comparative Religion | 3 |
| Phil. 483—Philosophy of Social Sci | 3 |
| Phil. 484—Philosophy of History | 3 |

Successfully complete a comprehensive oral examination conducted by the staff of the Department of Philosophy covering all course work in Philosophy. The student is to arrange for the examination at the beginning of the last semester of his major study.

**A minor in Philosophy requires 18 credits of approved Philosophy courses including:**

| | *Credits* |
|---|---|
| Phil. 201—Introduction to Philosophy | 3 |
| Phil. 351-352—History of Philosophy | 6 |
| Phil. 471—Contemp. Philosophical Prob | 3 |
| Choose six credits from the following: | |
| Phil. 202—Intro. to Eastern Philosophy | 3 |
| Phil. 204—Introduction to Logic | 3 |
| Phil. 321—Aesthetics | 3 |
| Phil. 332—Ethics | 3 |
| Phil. 341—Epistemology | 3 |

Phil. 342—Metaphysics.....3
Phil. 481—Philosophy of Science.....3
Phil. 482—Comparative Religion.....3
Phil. 483—Philosophy of Social Sci.....3
Phil. 484—Philosophy of History.....3
Phil. 493/494—Special Topics.....Arr.

## PHYSICAL EDUCATION

*See Health, Physical Education, and Recreation.*

## PHYSICAL THERAPY

*See Health Sciences, Preprofessional Curricula.*

## PHYSICS

*College of Mathematics, Physical Sciences, and Engineering*

**Degrees:** Bachelor of Arts, Bachelor of Science, Master of Science, Master of Arts in Teaching, Doctor of Philosophy

**Minimum Requirements for Degrees:** B.A.—130 Credits; B.S.—130 Credits; M.S.—30 Additional Credits; M.A.T.—30 Additional Credits; Ph.D.—No Fixed Credits.

The science of physics is concerned with the nature of matter and energy and encompasses all phenomena in the physical world from elementary particles to the structure and origin of the universe. Physics provides, together with mathematics and chemistry, the foundation of work in all fields of physical science and engineering, and contributes to other fields such as biology, geology, and marine science.

**Undergraduate Program**—The undergraduate curriculum aims at a good foundation in general physics with emphasis on the experimental aspects. It provides opportunities for careers in education and industry, and opens the door to advanced work in physics and related sciences.

**Graduate Program**—The graduate work is intimately connected with the research activities of the Geophysical Institute which offer ample thesis material in the fields of the atmospheric and space sciences, experimental atomic and molecular physics, and in solid earth physics. The research program of the Geophysical Institute currently emphasizes investigations of auroral and ionospheric physics, geomagnetism and earth currents, radio wave propagation and scattering, solar radio astronomy and solar-terrestrial relations, polar meteorology and glaciology, seismology and solid earth physics, and laboratory studies of atomic and molecular interactions.

A graduate student may designate his major field as physics or geophysics. He will pursue his studies under the supervision of an advisory committee consisting of his major professor (chairman), two approved faculty members, and the department head (ex officio). The committee advises on the course of study to be followed and determines the background courses (mathematics, physics, astronomy, chemistry, geophysics) necessary to support the major field.

### Physics—B.A. Degree

**1.** Complete the general University requirements and B.A. degree requirements, pages 27-9.

**2.** Complete the following program (major) requirements:

Complete the foundation courses:
Phys. 211-212—General Physics.....8
Complete a minor in Mathematics, which includes Math. 200-201-202, and 6 credits at the 300-level or above.
Complete 20 additional credits of approved courses in Physics.

### Applied Physics—B.S. Degree

**1.** Complete the general University requirements and B.S. degree requirements, pages 27-9.

**2.** Complete the following program (major) requirements:

Complete Math. 200-201-202, 302 and 9 additional credits in mathematics at the 200-level or above.

*Complete Physics 311 and 331 and 12 additional credits in physics at the 300-level or above.

Complete 20 approved credits** in a chosen subject area of Applied Physics.

*Implicit in this requirement are 16 credits of lower-division physics courses which are prerequisites for these courses.

**These credits must be approved before the beginning of the student's final semester by the head of the Physics Department.

### Physics—B.S. Degree

**1.** Complete general University requirements and B.S. degree requirements, pages 27 and 29.

**2.** Complete the following program (major) requirements:

Math. 200-201-202, 302 and 9 additional credits at the 300-level or above.

Phys. 211-212, 311-312-313, 331-332, 411-412, 445, 381 and 382 or 481-482.

#### Suggested Curriculum

First Year
*Fall Semester* — *17 Credits*
Engl. 111—Methods of Written Comm.....3

Phys. 105—University Physics ..... 4
Math. 200—Calculus ..... 4
Chem. 105—General Chemistry ..... 4
Free electives ..... 2

*Spring Semester* — *17 Credits*
Sp.C. 111—Fundamentals of Oral Comm ..... 3
Phys. 106—University Physics ..... 4
Math. 201—Calculus ..... 4
Chem. 106—General Chemistry ..... 4
Free electives ..... 2

**Second Year**

*Fall Semester* — *16 Credits*
Math. 202—Calculus ..... 4
Phys. 211—General Physics ..... 4
Engl. 211—Intermediate Exposition with Modes of Literature
*or* Engl. 213—Intermediate Exposition ..... 3
Humanities/Social Science elective ..... 3
Free electives ..... 2

*Spring Semester* — *16 Credits*
Math. 302—Differential Equations ..... 3
Phys. 212—General Physics ..... 4
Humanities/Social Science electives ..... 6
Free electives ..... 3

**Third Year**

*Fall Semester* — *17 Credits*
Math. 321—Intermed. Applied Mathematics ..... 4
Phys. 313—Classical Physics ..... 4
Phys. 331—Electricity and Magnetism ..... 3
Phys. 381—Physics Laboratory ..... 2
Humanities/Social Science electives ..... 3
Free elective ..... 1

*Spring Semester* — *16 Credits*
Math. 422—Intermed. Applied Mathematics ..... 4
Phys. 445—Solid State Physics and Physical Electronics ..... 3
Phys. 332—Electricity and Magnetism ..... 3
Phys. 382—Laboratory ..... 2
Humanities/Social Science electives ..... 3
Free elective ..... 1

**Fourth Year**

*Fall Semester* — *15 Credits*
Phys. 411—Modern Physics ..... 4
Phys. 311—Classical Physics ..... 4
Math elective ..... 3
Free electives ..... 4

*Spring Semester* — *16 Credits*
Phys. 412—Modern Physics ..... 4
Phys. 312—Classical Physics ..... 4
Free electives ..... 8

**A minor in Physics requires 12-16 credits.**

### Physics or Geophysics—M.S. Degree

1. Complete the general University requirements and master's degree requirements, pages 27 and 29-30.
2. Complete a minimum of 30 credits of approved courses, including Phys. 699, Thesis.

### Physics—M.A.T. Degree

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

### Physics or Geophysics—Ph.D. Degree

Complete the general University requirements and Ph.D. requirements, pages 27 and 30-1.

## POLICE ADMINISTRATION PROGRAM

*College of Business, Economics, and Government*

**Degree:** Associate in Arts
**Minimum Requirements for Degree:**
65 Credits

### Police Administration—A.A. Degree

1. Complete the general University requirements as listed on page 27.
2. Complete the following degree and program (major) requirements.

*Credits*

A. General Requirements: 32 credits
†English ..... 6
Speech ..... 2
†Political Science 101-102 ..... 6
†Psychology 101 ..... 3
†Sociology 101 ..... 3
†At least 6 credits in two of the following areas: Natural Science, Math, Humanities or other ..... 12

B. Elective Courses in Social Science: 12 credits
Psychology — †Anthropology
†Sociology — Behavioral Science
Political Science

C. Core Courses: 12 credits
**P.A. 110—Intro. to Criminal Justice ..... 3
P.A. 251—Criminology
*or* *P.A. 151-C—Intro. to Criminology ..... 3
P.A. 252—Criminal Law ..... 3
P.A. 254—Procedural Law ..... 3

D. Elective Courses in Police Admin.: 9 credits
P.A. 150—Police Administration ..... 3
*P.A. 156-C—Patrol Procedures ..... 3
*P.A. 159-C—Organization, Management, and Administration ..... 3
**P.A. 255—Criminal Investigation ..... 3
P.A. 257—Traffic Safety ..... 3
P.A. 258—Juveniles and the Law ..... 3
P.A. 259—Administrative Concepts ..... 3

†These requirements can be fulfilled, through Correspondence Study, to a maximum of 15 credits.
*These courses are offered in Correspondence Study only.
**These courses are available for Correspondence Study also.

**Requirements for a Minor in Police Administration**

1. Complete 12 credits in Police Administration including:

| | *Credits* |
|---|---|
| P.A. 110—Intro. to Criminal Justice | 3 |
| P.A. 251—Criminology | 3 |
| P.A. 252—Criminal Law | 3 |
| P.A. 254—Procedural Law | 3 |

2. Complete 9 credits of electives in Police Administration from the following:

| | |
|---|---|
| P.A. 150—Police Administration | 3 |
| P.A. 255—Criminal Investigation | 3 |
| P.A. 257—Traffic Safety | 3 |
| P.A. 258—Juveniles and the Law | 3 |
| P.A. 259—Administrative Concepts | 3 |

## POLITICAL SCIENCE

*College of Business, Economics, and Government*

**Degree:** Bachelor of Arts
**Minimum Requirements for Degree:**
130 Credits

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

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

**Political Science—B.A. Degree**

1. Complete general University requirements and B.A. degree requirements, pages 27-9.
2. Complete the following program (major) requirements:

| | *Credits* |
|---|---|
| Hist. 101-102—Western Civilization | 6 |
| Hist. 131-132—History of the U.S. | 6 |
| Econ. 121-122—Principles of Economics | 6 |

Basic courses in philosophy, sociology and psychology are strongly recommended for majors. Also, a course in statistical interpretation is considered essential to those contemplating graduate study.

| | |
|---|---|
| P.S. 101-102—Intro. to American Government and Politics | 6 |
| P.S. 201—Comparative Politics: Methods of Political Analysis | 3 |
| P.S. 202—Comparative Politics: Contemporary Doctrines and Structures | 3 |
| P.S. 321-322—International Politics | 6 |
| P.S. 401-402—Political Behavior | 6 |

Six credits in Political Theory from the following:

| | |
|---|---|
| P.S. 315, 411, 412, 415 | 6 |

**A minor in Political Science requires 15 hours of credit distributed as follows:**

| | |
|---|---|
| P.S. 101-102—Intro. to American Govt. and Politics | 6 |
| P.S. 201 or 202—Comparative Politics: Political Analysis and Doctrines and Structures | 3 |
| P.S. 321 or 322—International Politics | 3 |

Three credits in Political Theory from the following:
P.S. 315, 411, 412, or 415

## PSYCHOLOGY

*College of Behavioral Sciences and Education*

**Degrees:** Bachelor of Arts, Bachelor of Science
**Minimum Requirements for Degrees:**
B.A.—130 Credits; B.S.—130 Credits

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

***Psychology—B.A. or B.S. Degree**

1. Complete general University requirements and B.A. or B.S. degree requirements, pages 27-9.
2. Complete the following program (major) requirements:

30 credits in Psychology beyond Psy. 101 and 201, including:

| | *Credits* |
|---|---|
| Psy. 251—Intro. Statistics for Behavioral Sciences (Soc) | 3 |
| Psy. 261—Intro. to Experimental Psy. | 3 |
| Psy. 406—Theories of Personality | 3 |
| Psy. 464—Learning | 3 |

Clinically-Oriented Courses: Complete 9 credits from the following:

| | |
|---|---|
| Psy. 245—Child Development | 3 |
| Psy. 246—Adolescence | 3 |
| Psy. 302—Social Psychology | 3 |
| Psy. 338—Abnormal Psychology | 3 |
| Psy. 373—Psychological Testing | 3 |
| Psy. 433—Clinical Psychology | 3 |

Experimentally-Oriented Courses: Complete 9 credits from the following:

| | |
|---|---|
| Psy. 301—History and Systems of Psy | 3 |
| Psy. 362—Intermediate Experimental Psy. | 3 |
| Psy. 407—Motivation | 3 |
| Psy. 465—Comparative and Physiological Psychology | 3 |

Psy. 466—Perception.....3
Psy. 473—Social Science Research.....3
Complete 9 credits from the following: one course each from Anthropology, Philosophy and Sociology.

A minor is not required for the B.S. degree with a major in Psychology.

**A minor in Psychology requires 15 credits in Psychology beyond Psy. 101 and 201.**

*A Psychology/Sociology course cross-referenced in both fields can be used only once when the major and minor are in Psychology/Sociology.

## REGIONAL DEVELOPMENT
*Interdisciplinary Graduate Program*

**Degree:** Master of Arts or Master of Science
**Minimum Requirements for Degree:** 30 Credits, including Thesis (Beyond a Bachelor's Degree)

The graduate-level interdisciplinary program in Regional Development leads to an M.A. or M.S. degree. Any student who qualifies for admission to graduate status may be admitted to the program. After completing eight credits of graduate study with grades of B or better, and having had a thesis project and title approved, the student may apply for admission to formal candidacy for a master's degree in Regional Development.

The objectives of the Regional Development program are to provide the student with a well-rounded understanding of the physical and cultural endowments of the North, especially Alaska; of the philosophies, opportunities, and problems affecting development of such areas; and of the means and procedures available for assuring intelligent regional development, both now and in the future.

Another objective is to provide the training necessary to qualify graduates for junior and intermediate positions on planning staffs or for admission to more advanced training leading to higher degrees and to senior-level professional positions.

A further objective is to provide broad background for public officials and for educators, journalists, and others who seek to become better qualified to help shape the development of Alaska and other areas.

The scope of the program will differ for different students according to their undergraduate backgrounds and graduate interests. Students are admitted from a great variety of liberal arts, engineering, scientific, and other B.A. and B.S. programs and then take such courses as will give them a broad foundation in regional - development philosophy and practice, and will lead them toward concentration in one of the several particular specialties required for work on a planning team. Each student's program will include a balanced core curriculum and will allow for some individual specialization in any of several options. The core curriculum requires completion of one appropriate three-credit course in each of the following areas:

1. The character of the natural environment and resource bases of the North, particularly Alaska and its bordering waters.
2. Special engineering problems and conservational considerations affecting the use of Northern resources.
3. Culture and history of the Native peoples.
4. History of the North, especially Alaska, since the beginning of white exploration, occupation, exploitation, and development.
5. Present-day economic and sociological conditions, trends, and problems in the North, particularly in Alaska.
6. Interregional, national, and international governmental relationships of special significance to Alaska's development.
7. Philosophies, concepts, and techniques of rural, wilderness, urban, and urban-rural regional planning.

The University has several research institutes in which regional-development research is a major interest and in which the student can find abundant opportunity to carry on meaningful research for his thesis. Members of these University institutes teach some of the courses in the program or give guest lectures. The various Alaska state government departments concerned with planning, and the planning offices of the larger cities and boroughs in Alaska, also provide opportunities for on-the-job internship and thesis research.

The program normally will require four semesters to complete 30 credits, including thesis. In some instances, however, the time required may be lessened by transfer of credit for previous training. There is no foreign language requirement.

The program as a whole is administered by a standing committee appointed by the Provost. Committee members represent the several participating colleges. Further information about the program in Regional Development may be obtained from the Head, Department of Geography, College of Earth Sciences and Mineral Industry.

## RUSSIAN STUDIES

*Interdisciplinary Major Program*

**Degree:** Bachelor of Arts
**Minimum Requirements for Degree:**
130 Credits

**Russian Studies—B.A. Degree**

1. Complete general University requirements and B.A. degree requirements, pages 27-9.
2. Complete the following program (major) requirements:

| Core courses (24 credits): | *Credits* |
|---|---|
| Anth. 329—Peoples of U.S.S.R. | 3 |
| Geog. 306—Geography of the Soviet Union | 3 |
| Hist. 261—Russian History | 3 |
| Hist. 344—Twentieth Century Russia | 3 |
| Russ. 301—Advanced Russian* | 3 |
| Russ. 302—Advanced Russian* | 3 |
| Russ 321—19th Century Russian Lit. | 3 |
| Russ. 322—20th Century Russian & Soviet Lit. | 3 |

*Students must complete two years of Russian language study (Russ. 101-102-201-202) or equivalent as a prerequisite for Russ. 301-302.

Complete at least 12 credits from the following courses or alternatives as approved by the Program Advisor:

| | |
|---|---|
| Econ. 423—Comparative Economic Systems | 3 |
| Geog. 405—Political Geography | 3 |
| Hist. 315—Europe 1914-1945 | 3 |
| Pc.A. 492—Peace Arts Seminar | 3 |
| Phil. 471—Contemporary Philosophical Prob. | 3 |
| P.S. 202—Comparative Politics: Contemporary Doctrines and Structures | 3 |
| P.S. 321—International Politics | 3 |
| P.S. 322—International Politics | 3 |
| Russ. 351—The Russian Novel | 3 |
| Russ. 382—Russian Drama in English Trans | 3 |

**A minor in Russian studies requires 15 credits taken from the core courses and approved by the Program Advisor.**

## SCIENCE

**Degree:** Associate in Arts
**Minimum Requirements for Degree:**
60 Credits.

**Science—A.A. Degree**

1. Complete the general University requirements as listed on page 27.
2. Complete the following degree and program (major) requirements:

| | *Credits* |
|---|---|
| Engl. 67-68 or 111 and 211 or 213 | 6 |
| Oral Communication | 3 |
| Humanities | 6 |
| Social Science | 6 |
| Six credits in one of the following: | |
| Natural Science, Mathematics, or other | 6 |
| Major Requirements: | |
| One semester of college level calculus | 3 or more |
| A year's sequence course in Biology, Chemistry, Geology, or Physics, plus two semesters in area other than that chosen for sequence | 14-16 |
| Approved Science elective (may include courses in Mathematics or Applied Science such as Engineering, Wildlife Mgmt., etc.) | 4-6 |
| Electives to total | 60 credits |

Courses used to meet the degree requirements may not be used to meet the major requirements.

## SOCIOLOGY

*College of Behavioral Sciences and Education*

**Degrees:** Bachelor of Arts, Bachelor of Science
**Minimum Requirements for Degrees:**
B.A.—130 Credits; B.S.—130 Credits.

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

***Sociology—B.A. or B.S. Degree**

1. Complete the general University requirements and B.A. degree requirements, pages 27-9.
2. Complete the following program (major) requirements:

Complete 30 credits in Sociology beyond Soc. 101-102, including:

| | *Credits* |
|---|---|
| Soc. 251—Intro. Statistics for Behavioral Sciences (Psy.) | 3 |
| Soc. 302—Social Psychology (Psy.) | 3 |
| Soc. 304—Culture and Personality | 3 |
| Soc. 309—Urban Sociology | 3 |
| Soc. 402—Theories of Sociology | 3 |
| Soc. 473—Social Science Research Methods (Psy) | 3 |
| Sociology electives (Soc. 383 and 407 recommended) | 9 |

Complete 9 credits composed of one course each from Anthropology, Philosophy, and Psychology.

A minor is not required for the B.S. degree with a major in Sociology.

***A minor in Sociology requires 15 credits in Sociology beyond Soc. 101-102.**

**Sociology Option**

A concentration in social services is offered which concerns itself with the knowledge and methods used in the social institutions for the maintenance and enhancement of human social functioning. The social services include counseling, social work, social welfare, corrections, probation, and parole.

***Sociology with a Concentration in Social Services — B.A. or B.S. Degree**

**1.** Complete the general University requirements and B.A. or B.S. degree requirements, pages 27-9.

**2.** Complete the following program (major) requirements:

Complete 32 credits beyond Soc. 101-102 and Psy. 101-201. Required in the 32 credits are:

| | *Credits* |
|---|---|
| Soc. 201—Social Problems | 3 |
| Soc. 251—Intro. Statistics for Behavioral Sciences (Psy.) | 3 |
| Soc. 333—Social Welfare as a Social Institution | 3 |
| Soc. 336—Social Work Methods | 3 |
| Soc. 363—Social Stratification | 3 |
| Soc. 383—Field Observation | 2-3 |
| And 11 credits from the following courses: | |
| Soc. 242—The Family | 3 |
| Soc. 302—Social Psychology (Psy.) | 3 |
| Soc. 304—Culture and Personality | 3 |
| Soc. 309—Urban Sociology | 3 |
| Soc. 343—Sociology of Deviant Behavior | 3 |
| Soc. 408—American Minority Groups | 3 |
| And 3 credits from the following courses: | |
| Psy. 245—Child Development (H.E.) | 3 |
| Psy. 246—Adolescence (Soc.) | 3 |
| Psy. 338—Abnormal Psychology | 3 |
| Psy. 433—Clinical Psychology | 3 |

And in consultation with advisor it is recommended that one course each be chosen from Anthropology, Philosophy, and Political Science.

*A Psychology/Sociology course cross-referenced in both fields can be used only once when the major and minor are in Psychology/Sociology.

## SPEECH, DRAMA, AND RADIO

*College of Arts and Letters*

**Degree:** Bachelor of Arts
**Minimum Requirements for Degree:** 130 Credits

Few phenomena of man's life are of greater concern to him than communication. In one way or another, communication has become the common problem, sine qua non, of the sciences and the arts alike. The life and behavioral sciences concern themselves directly with communication, for it is the processes of communication which define and maintain the structure and functioning of living things. The physical sciences from archaeology to space have an equal, if less direct, concern for the progress and development of any science depends upon communication. It is the business of the arts to communicate, just as it is the art of science to communicate.

The University, as the embodiment of all the fields of human endeavor, has the responsibility to disseminate its accumulated and expanding knowledge to the state and to the world. The Department of Speech, Drama, and Radio through its related disciplines is an important part of this communication process.

The department offers elective courses leading to a major or minor in speech with options in public address, drama, and broadcasting. The department also offers majors or minors in theatre and speech communications.

**Speech—B.A. Degree**

**1.** Complete the general University requirements and B.A. degree requirements, pages 27-9.

**2.** Complete the following program (major) requirements:

Complete 27 credits in the Speech Department including:

| | *Credits* |
|---|---|
| A. Sp.C. 111—Fundamentals of Oral Comm | 3 |
| Thr. 211—Introduction to Theatre | 3 |
| Brd. 211—Introduction to Broadcasting | 3 |
| Sp.C. 311—Introductory Phonetics | 3 |
| Sp.C. 211—Voice and Diction | 2 |

B. A Speech major may elect to take an option in Public Address by adding the following courses to those specifically required in A.

Sp.C. 241—Public Speaking I ..... 3
Sp.C. 351—Argumentation and Debate ..... 3
Sp.C. 235—Discussion and Small Group Process ..... 3
Sp.C. 361—Oral Interpretation ..... 3

C. A Speech major may elect to take an option in Drama by adding the following courses to those specifically required in A. (above):

Thr. 221—Acting I ..... 3
Thr. 241—Basic Stagecraft ..... 3
Thr. 351—Make-up for Theatre ..... 3
Thr. 331—Directing
*or* Thr. 321—Acting II ..... 3

D. A Speech major may elect to take an option in Broadcasting by adding the following courses to those specifically required in A. (above):

Brd. 213—Announcing ..... 2
Brd. 215—Radio Production ..... 3
Brd. 216—Television Production ..... 3
Brd. 217—Writing for Radio and Television ..... 3
Brd. 331—Radio-Television Advertising
*or* Brd. 341—Radio-Television News ..... 3

**A minor in Speech requires 12 credits of approved Speech electives in two areas of the department**

**Speech Communication—B.A. Degree**

**1.** Complete the general University requirements and B.A. degree requirements, pages 27-9.

**2.** Complete the following program (major) requirements:

A. Complete the following foundation courses and B. or C. below.

| | *Credits* |
|---|---|
| Sp.C. 111—Fundamentals of Oral Comm | 3 |
| Sp.C. 211—Voice and Diction | 2 |
| *or* Sp.P. 210—Speech Processes | 3 |
| Sp.C. 235—Discussion and Small Group Process | 3 |
| Sp.C. 311—Introductory Phonetics | 3 |
| Sp.C. 320—General Semantics | 3 |
| Sp.C. 325—Communication Theory | 3 |
| Sp.C. 351—Argumentation and Debate | 3 |

B. Speech Communications majors electing to complete the major with maximum breadth must complete, with the specific approval of the major advisor, a minimum of 12 additional credits from the department's courses and a minimum of 6 credits from the following courses:

Anth. 202—Cultural Anthropology ..... 3
Anth. 429—Language in Culture ..... 3
A.S. 301—Elem. Probability and Statistics ..... 3
A.S. 402—Scientific Sampling ..... 3
CIS 101—Introduction to Data Processing and Fortran ..... 3
CIS 210—Systems Design and Analysis ..... 3
CIS 220—Basic Programming Languages ..... 3
Psy. 101—Introduction to Psychology ..... 3
Soc. 101—Introduction to Sociology ..... 3

C. Speech Communications majors wishing to complete the major with a concentration in professionally oriented Speech Pathology must complete a minimum of 12 credits in Speech Pathology courses and a minimum of 6 credits in courses approved by the major advisor from the following:

Psy. 201—Advanced General Psychology ..... 3
Psy. 245—Child Development ..... 3
Psy. 246—Adolescence ..... 3
Psy. 251—Introductory Statistics for Behavioral Sciences ..... 3
Psy. 338—Abnormal Psychology ..... 3

**A minor in Speech Communications requires 18 credits selected from the foundation courses and including Sp.C. 111.**

**Theatre—B.A. Degree**

**1.** Complete the general University requirements and B.A. degree requirements, pages 27-9.

**2.** Complete the following program (major) requirements:

A. Complete the following foundation courses:

| | *Credits* |
|---|---|
| Thr. 211—Introduction to the Theatre | 3 |
| Thr. 221—Acting I | 3 |
| Thr. 241—Basic Stagecraft | 3 |
| Thr. 325—Theatre Speech | 3 |
| Thr. 331—Directing | 3 |
| Thr. 341—Intermediate Stagecraft | 3 |
| Thr. 351—Make-up for Theatre | 3 |

B. Complete a minimum of 9 credits from the following courses:

Thr. 101-401—Theatre Practicum ..... *3
Thr. 321—Acting II ..... 3
Thr. 343—Scene Design ..... 3
Thr. 347—Lighting Design ..... 3
Thr. 355—History of Stage Costume ..... 3
Thr. 435—Directing ..... 3

*Only 3 credits of Theatre Practicum may count toward the major.

C. Complete a minimum of 6 credits from the following courses with the approval of the major advisor:

Art 161-162—Design and Color Theory ..... 2 each
Art 261-262—History of World Art ..... 3 each
Brd. 217—Television Production ..... 3
E.S. 101-102—Graphics ..... 2 each
Engl. 217—Introduction to Drama ..... 3
Engl. 422—Shakespeare: History Plays and Tragedies ..... 3
Engl. 425—Shakespeare: Comedies and Non-Dramatic Poetry ..... 3
Engl. 445—20th Century Drama: From Chekhov to Ionesco ..... 3
Engl. 483—Craft of Drama ..... 3
Mus. 123-124— Introduction to Music ..... 3 each
Sp.C. 361—Oral Interpretation ..... 3

**A minor in Theatre requires 18 credits selected from the foundation courses and including Thr. 211.**

## VETERINARY MEDICINE

Students planning to become veterinarians are required to complete at least two or three years of pre-veterinary study at the college level. Upon completion of these studies, a student applies for admission to the professional school of veterinary medicine of his choice. Pre-veterinary students usually enroll in the Department of Biological Sciences, where they follow a sequence of courses designed to meet specific needs. Pre-veterinary studies normally include English, general and organic chemistry, mathematics, physics, biological sciences, animal science, and some experience in the care and handling of animals.

## WILDLIFE MANAGEMENT

*College of Biological Sciences and Renewable Resources*

**Degrees:** Bachelor of Science, Master of Science, Doctor of Philosophy (Interdisciplinary)

**Minimum Requirements for Degrees:** B.S.—130 Credits; M.S.—30 Additional Credits.

The wildlife management curriculum in the undergraduate program in the Department of Wildlife and Fisheries is intended to provide basic education and training. Holders of the bachelor's degree will be qualified to enter the management, law enforcement, and public information-education phases of wildlife work. Students contemplating careers in research, administration, advanced management work, or teaching will find the bachelor's curriculum a solid foundation for graduate study.

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

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

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

**Wildlife Management—B.S. Degree**

**1.** Complete the general University requirements as listed on page 27.

**2.** Complete the following degree and program (major) requirements:

**First Year**

| *Fall Semester* | *15 Credits* |
|---|---|
| Biol. 107-108—Fund. of Biology | 4 |
| Chem. 105—General Chemistry | 4 |
| Engl. 111—Methods of Written Comm | 3 |
| L.R. 102-103—Conservation of Nat. Resources | 3 |
| †Math. 170—Derivative for the Life Sciences | 1 |
| *Spring Semester* | *16 Credits* |
| *Biol. 210—General Physiology | 4 |
| Chem. 106—General Chemistry | 4 |
| *Biol. 239—Plant Form & Function | 4 |
| Math. 172—An Introduction to Calculus for the Life Scientist | 4 |

**Second Year**

| *Fall Semester* | *15 Credits* |
|---|---|
| Biol. 271—Principles of Ecology | 3 |
| Geol. 101 or 111—General or Physical Geology | 4 |
| General Economics elective | 3 |
| Math. 203—Intro. Finite Mathematics | 4 |
| W.F. 333—Literature of Ecology and Resource Management | 1 |
| *Spring Semester* | *16 Credits* |
| Biol. 205—Vertebrate Anatomy | 3 |
| Biol. 222—Biology of Vertebrates | 4 |
| Sp.C. elective | 3 |
| Econ. 235—Resource Economics | 3 |
| Engl. 211 or 213—Intermediate Exposition | 3 |

**Third Year**

| *Fall Semester* | *17 Credits* |
|---|---|
| Phys. 103—College Physics | 4 |
| W.F. 301—Principles of Animal Population Dynamics and Management | 3 |
| Biol. 331—Systematic Biology | 4 |
| **Foreign Language | 3 |
| A.S. 301—Elementary Statistics | 3 |
| *Spring Semester* | *16 Credits* |
| Phys. 104—College Physics | 4 |
| Biol. 476—Animal Ecology | 3 |

L.R. 311—Soils.....3
**Foreign Language.....3
L.R. 354—Intro. Forest Systems.....3

**Fourth Year**

*Fall Semester* — *8+ Credits*
W.F. 401—Wildlife Management Techniques.....2
W.F. 423—Limnology
*or* OCN 411—General Oceanography.....3
Biol. 425—Mammalogy.....3

*Spring Semester* — *11+ Credits*
Engl. 414—Research Writing.....3
W.F. 402—Wildlife Biology and Mgmt.....2
A.S. 402—Scientific Sampling.....3
Biol. 426—Ornithology.....3

†Students inadequately prepared for calculus will take Math. 171 (4 credits) rather than Math. 170.
*Note prerequisite.
**One year of foreign language taken at the university level. French, German, or Russian are recommended. Students having three or four years of language in high school with a grade of C or better, may, with advisor's approval, substitute an equivalent number of credits in the humanities area.

In addition:
1. Complete B.S. Social Science/Humanities requirement.....9
2. Complete sufficient electives to bring the total to 130.
3. Bachelor of science candidates are strongly urged to obtain work experience in wildlife-related positions with public resource agencies or private firms. Faculty members can help students contact potential employers. Wildlife and fisheries undergraduate students will be asked each fall to describe their work experience of the previous year.

**Wildlife Management—M.S. Degree**

1. Complete the general University requirements and master's degree requirements, pages 27 and 29-30.
2. Complete a minimum of 30 credits of approved courses, including W.F. 699—Thesis, in the field of wildlife management.
3. Students working in subject areas involving significant non-English literature will be expected to read the appropriate foreign language.

**Wildlife Management—Interdisciplinary Ph.D. Degree**

See page 30-1 for degree requirements.

**Graduate Study in Wildlife Management**

The Department of Wildlife and Fisheries and the Alaska Cooperative Wildlife Research Unit cooperate in offering graduate work leading to the Master of Science degree. An interdisciplinary Doctor of Philosophy degree can also be offered. Persons desiring detailed information on the graduate program in wildlife management may obtain this from the head, Department of Wildlife and Fisheries. The procedure to be followed in applying for admission to graduate study is outlined in the section on Admission to Graduate Study in this catalog.

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

# Course Descriptions

Courses offered by the University are listed alphabetically by subject area.

### Course Numbers

The first numeral of a course numbered in the hundreds indicates the year in which the course is normally offered in its own department. For example, Engl. 111 is given for first-year students and Engl. 342 is given for third-year students. Freshmen and sophomore students cautioned to register for upper division (300 and 400) level courses only if they had adequate preparation and background to undertake advanced study in the field in which the course is offered.

1-49—Noncredit courses.

50-99—Courses designed for associate degree or technical certificate; they are not applicable to baccalaureate requirements.

100-299—Lower division courses.

300-499—Upper division courses. Freshman and sophomore students may be required to obtain special permission to take 300 and 400 level courses unless such courses are required in the first two years of their curriculum as printed in this catalog.

600-699—Graduate courses to which a few well qualified undergraduates may be admitted with the permission of the head of the department in which the course is offered.

*Special or Reserved Numbers*—Courses identified with numbers ending in -92 are seminars; ending in -93 or -94 are special topics courses, approved to be offered only once during the year or on a trial basis; -97 indicates individual study; -98, individual research; -99, thesis. Courses identified with these special or reserved numbers may be repeated for credit.

### Course Credits

One represents satisfactory completion of one hour of work a week for one semester. This requirement may be met by attendance at one lecture, or by three fifty-minute periods of laboratory work a week, or the equivalent.

Following title the of each course, the figures in parenthesis indicate the number of lecture and laboratory hours the class meets. The first lecture hours; the second, laboratory. For example (2+3) indicates that a class has two hours of lecture and three of laboratory work week.

The number of credits listed is for each semester. Thus "3 Credits" means three credits may be earned.

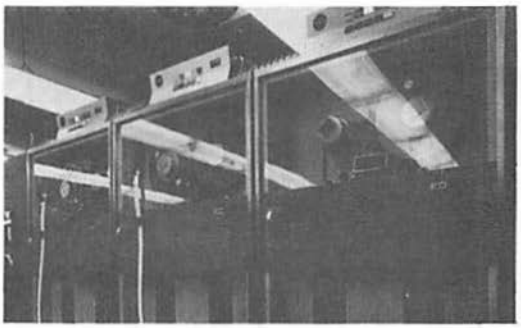
### Course Classifications

Subjects and courses that may used in satisfying generally stated degree requirements (e.g., "Social Science elective") have been classified as follows:

**Natural Sciences**
Anthropology 402
Biological Sciences
Chemistry
Geography 105, 209, 316, and 401
Geology
Mathematics
Physics

**Social Sciences**
Anthropology
Business Administration 331, 332
Economics
Geography except 105, 209, 316, and 401
History
Home Economics 236, 245, 407, 425
Political Science
Psychology
Sociology

**Humanities**
Art
English
Foreign Language and Literature
Home Economics 160, 260
Journalism
Linguistics
Music
Philosophy
Speech and Drama



## ACCOUNTING

**Acc. 51** **3 Credits** **Fall**
**Introduction to Accounting I (2+3)**
Emphasis on the recording functions of the accounting process. Bookkeeping for sole proprietor service enterprises and small retail businesses is studied for the entire accounting cycle. Payroll accounting and preparation of basic financial statements are introduced.

**Acc. 52** **3 Credits** **Spring**
**Introduction to Accounting II (2+3)**
Continuation of Acc. 51. Bookkeeping for sole proprietorships engaged in merchandising operations is studied for the entire accounting cycle. Accounting for sales, purchases, inventories, depreciation, noncurrent assets and owner's equity for individual proprietorships, partnerships and corporations is introduced. The study of preparation and analysis of financial statements is continued.

**Acc. 85** **3 Credits** **Spring**
**Tax Accounting (2+3)**
Emphasis on the preparation of individual income tax returns and on the completion of payroll tax reports. A thorough study of payroll accounting will be included.

**Acc. 101** **3 Credits** **Fall or Spring**
**Elementary Accounting (3+0)**
An introduction course in accounting concepts and procedures for service businesses and for merchandising businesses owned by a single proprietor. (Prerequisite: completion of all required remedial courses.)

**Acc. 102** **3 Credits** **Fall/Spring**
**Elementary Accounting (3+0)**
A continuation of introductory accounting concepts and procedures emphasizing the problems of businesses organized as partnerships or corporations and performing manufacturing operations. (Prerequisite: Acc. 101.)

**Acc. 310** **3 Credits** **Fall**
**Income Tax (3+0)**
A study of federal and state income taxes relating primarily to the individual residing in Alaska and an introduction to corporate income taxation. The course entails tax reporting, planning, and research.

**Acc. 311** **3 Credits** **Fall**
**Acc. 312** **3 Credits** **Spring**
**Intermediate Accounting (3+0)**
A treatment in depth of the balance sheet accounts and procedures for their analysis and correction. Study of working capital and fixed assets will receive special emphasis during Fall semester. Special attention will be given to long-term liabilities and stockholders' equity during Spring semester. (Prerequisites: Acc. 102.)

**Acc. 316** **3 Credits** **Fall**
**Accounting Information Systems (3+0)**
The design and analysis of accounting systems for business entities in various industries. Internal control for the business, data processing and its relationship to accounting systems examined. (Prerequisite: Acc. 102.)

**Acc. 342** **3 Credits** **Spring**
**Managerial Cost Accounting (3+0)**
A cost accounting course with a managerial emphasis focusing on breakeven analysis, job order costing, capital budgeting, profit planning, standard costing and variance analysis.

**Acc. 401** **3 Credits** **Fall**
**Advanced Accounting (3+0)**
A thorough study of the accounting for partnerships, parent-subsidiary relationships, fiduciaries, and installment sales.

**Acc. 402** **3 Credits** **Spring**
**Governmental Accounting (3+0)**
Principles and operations of fund accounting; financial reporting, budgetary control for governmental, municipal and non-profit organizations.

**Acc. 403** **3 Credits** **Spring**
**Advanced Taxes (3+0)**
A study of federal and state income taxes for all entities, gift, estate, and social security taxes. The course entails tax planning and tax research.

**Acc. 404** **3 Credits** **Fall**
**Adv. Managerial Cost Accounting**
A cost accounting course with a managerial emphasis focusing on inventory valuation, joint costing, process costing, decentralization, cost behavior patterns, sales mix and other cost analysis.

**Acc. 405** **3 Credits** **Spring**
**Contemporary Issues in Accounting (3+0)**
Current developments in financial and managerial

accounting theory and auditing standards examined. Relevant court cases, recent SEC rulings and AICPA sponsored studies affecting accounting will be researched and discussed. The course will focus on unresolved problems involving the accounting and auditing professions. (Prerequisite: Acc. 401)

**Acc. 452 3 Credits Fall**
**Auditing (3+0)**
A study of the procedures for verification of financial data and the professional standards applicable to the auditors examination of financial statements and his expression of opinion relative to them. (Prerequisite: Acc. 312.)

**Acc. 454 3 Credits Spring**
**Accounting Internship (3+0)**
Work experience in an approved position with supervision and training in various phases of accounting. (Prerequisites: advanced standing as an accounting major and permission of the head of the department.)

**Acc. 462 0 Credit Fall-Spring**
**C.P.A. Review**
Preparation for the Uniform Certified Public Accountant Examination. (Prerequisites: advanced standing in accounting and permission of the head of the department.)

**Acc. 493 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Acc. 494 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Acc. 497 Credits Arr. As Demand Warrants**
**Individual Study**
(Admission by arrangement.)

**Acc. 650 3 Credits Fall**
**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.)

## AGRICULTURAL SCIENCE

**Ag. 301 3 Credits Fall**
**Agricultural Prices (3+0)**
Analysis and interpretation of factors affecting agricultural prices; study of price movements; price policy. (Prerequisites: Econ. 121, 122. Offered as demand warrants.)

**Ag. 310 3 Credits Spring**
**Animal Science (2+3)**
Origin, history, and economic significance of breeds of dairy and beef cattle, swine, sheep, and poultry. Introduction to management, with special reference to Alaska. (Offered as demand warrants. Next offered 1974-75.)

**Ag. 311 4 Credits Fall**
**Applied Animal Nutrition (3+3)**
Application of feeding standards and feedstuffs analysis to the nutrition of farm animals. Comparative anatomy of the digestive system of pig, horse, and cow. (Offered in alternate years; next offered in 1975-76.)

**Ag. 381 3 Credits Fall**
**Plant Sciences (2+3)**
Principles of plant science as related to production to economic crops, with special attention to those grown in Alaska. (Offered alternate years; next offered in 1975-76. Prerequisite: A general course in botany.)

**Ag. 382 3 Credits Spring**
**Horticulture (2+3)**
Survey; principles of propagation, culture and use; soil, light, and water requirements; planting and harvesting; insect, weed, and disease control. (Prerequisites: Biol. 107-108, 239. Offered as demand warrants.)

**Ag. 404 3 Credits Spring**
**Agricultural Marketing (3+0)**
Principles and practices of agricultural marketing; prices and costs; case studies. (Prerequisite: Econ. 121. Offered as demand warrants.)

**Ag. 410 3 Credits Fall**
**Animal Nutrition and Metabolism (3+0)**
Nutrition and metabolism of domestic animals; ruminant and monogastric. (Prerequisites: Chem. 105-106; biochemistry recommended.)

**Ag. 492 Credits Arr. Fall-Spring**
**Seminar**
Unique problems in agricultural development of Alaska, the role of agriculture in Alaska's economy, and recent research advances in the state. Subject matter fields; economics, agronomy, animal industry, soils, horticulture, and agricultural engineering. (Offered as demand warrants.)

**Ag. 493 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Ag. 494 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Ag. 497 Credits Arr. As Demand Warrants**
**Individual Study**
(Admission by arrangement.)

**Ag. 693 Credits Arr. As Demand Warrants**
**Special Top**
Special topics course approved to be offered only once during an academic year.

**Ag. 694 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Ag. 697 Credits Arr. As Demand Warrants**
**Individual Study**
(Admission by arrangement.)

**Ag. 698 Credits Arr. Fall-Spring**
**Research**
Investigations of problems separate from, supplementary to, or of lesser scope than the thesis. (Admission by arrangement.)

**Ag. 699 Credits Arr. Fall-Spring**
**Thesis**
(Admission by arrangement.)

## ALASKA NATIVE LANGUAGES

**ANL 215 3 Credits Fall**
**ANL 216 3 Credits Spring**
**Alaska Native Languages (3+0)**
A survey of all Native Languages of Alaska, open to all students. History, present, and future of these languages; examples of Indian and Eskimo language structures, with native speakers in class; present situation and prospects for the future as a cultural and political force in Alaska and elsewhere. Fall semester devoted mainly to Eskimo and Aleut; Spring to Athapaskan, Eyak, Tlingit, Haida, Tsimshian. Semesters may be taken independently.

**ANL 387 3 Credits Fall**
**ANL 388 3 Credits Spring**
**Bilingual Methods and Materials (3+0)**
Training and research in bilingual education methods in Alaska native languages and preparation of books and materials in any of them.

**ANL 493 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**ANL 494 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**ANL 497 Credits Arr. As Demand Warrants**
**Individual Study**
(Admission by Arrangement)

**ANL 693 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**ANL 694 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**ANL 697 Credits Arr. As Demand Warrants**
**Individual Study**
(Admission by Arrangement)

## ANTHROPOLOGY

**Anth. 101 3 Credits Fall**
**The Study of Man (3+0)**
Introduction to anthropology, including the physical and cultural aspects of man.

**Anth. 202 3 Credits Spring**
**Cultural Anthropology (3+0)**
Basic theories and current concepts of cultural anthropology regarding the social, political, and aesthetic life of primitive societies.

**Anth. 203 3 Credits Fall**
**World Ethnography (3+0)**
A descriptive study of peoples of the world: Europe, Asia, and Africa.

**Anth. 204 3 Credits Spring**
**World Ethnography (3+0)**
A descriptive study of peoples of the world: the New World and the Pacific.

**Anth. 205 3 Credits Fall**
**Physical Anthropology (3+0)**
An introductory course including the behavior, genetics, classification, and evolution of man and the

other primates, as well as the distribution, morphological and physiological adaptations of modern human populations.

**Anth. 206 3 Credits Spring**
**World Prehistory (3+0)**
The inventions of man and the spread of culture in the Old and New World. (Prerequisites: Anth. 101 or 203 or 204, or permission of the instructor.)

**Anth. 214 3 Credits Fall**
**Archaeology (3+0)**
The history of archaeology and a study of its methods.

**Anth. 312 3 Credits Fall-Spring**
**North American Archaeology (3+0)**
Prehistoric cultures north of Mexico. Archaeological methods peculiar to America and problems related to the prehistory of the Arctic Regions. (Prerequisite: Anth. 214.)

**Anth. 326 3 Credits Spring**
**Arctic Ethnology (3+0)**
Ethnic groups and cultures of the circumpolar area.

**Anth. 328 3 Credits Spring**
**Arctic Archaeology (3+0)**
Problems of the prehistory of the Arctic. (Prerequisite: Anth. 214.)

**Anth. 329 3 Credits Fall**
**Peoples of the U.S.S.R. (3+0)**
Native peoples of Siberia and adjoining regions. (Prerequisite: Anth. 101.)

**Anth. 330 3 Credits Spring**
**Archaeology of Northern Asia (3+0)**
A study of prehistoric cultures of Northern Asia including Siberia, Central Asia, North China, Korea and Japan from the earliest evidence of human occupation up to the Historic Period. (Prerequisites: Anth. 214 or Anth. 206, or permission of the instructor.)

**Anth. 333 3 Credits Spring**
**The Biology of Arctic Peoples (3+0)**
Human population biology of Arctic groups in New and Old Worlds: Analysis of patterns of biological variation within and between prehistoric and modern Arctic populations. Emphasis on origins and historical relationships, microevolutionary processes, and adaptation to climatic stress. Demographic, ecologic, and cultural factors considered relative to their influence on biological variation; also, pre- and post-contact health problems. (Prerequisite: Anth. 205. Recommended: Anth. 328 or Anth. 523. Offered alternate years, next offered Spring 1976.)

**Anth. 334 3 Credits Spring**
**Physical Anthropology of the New World (2+2)**
Native Americans exclusive of Arctic populations: early migrations, demography, diets, microevolution, health, disease, and cultural practices—all as revealed by studies of the prehistoric and protohistoric skeletal remains, and by the genetics and morphology of living tribes. The value of integrating biological, ethnographical, and archaeological data is emphasized. (Prerequisite: Anth. 205. Recommended: Anth. 204 or 335. Offered alternate years.)

**Anth. 335 3 Credits Fall**
**North American Ethnology (3+0)**
Tribal life of American Indians north of Mexico.

**Anth. 342 3 Credits Spring**
**Anthropology of the Natives of Alaska (3+0)**
Indians and Eskimos of Alaska. Social organization, social customs, and problems of acculturation. Primarily for students who expect to teach in Alaska. (Prerequisites: Anth. 101, Hist. 341 or junior standing.)

**Anth. 401 3 Credits Fall**
**Primate and Human Evolution (3+0)**
The fossils — their morphology, inferred functional and ecological relationships, geochronologic and geochronometric placements. Current taxonomic and phylogenic assessments, theories of evolutionary processes, and the role of culture in hominid evolution are also major concerns. Contributions of biochemistry and chromosomal studies to an understanding of primate evolution are also considered. (Prerequisite: Anth. 205 or Biol. 208 or permission of the instructor.)

**Anth. 403 3 Credits Fall**
**Human Osteology (2+3)**
Human skeletal analysis: bone biology, skeletal anatomy, aging and sexing, metric and nonmetric traits of skeleton and dentition, paleopathology, and paleodemography. Inferences on genetic relationships between and patterned behavior within prehistoric groups derived from skeletal material. (Prerequisite: Anth. 205 or Biol. 201, 205, or 317. Offered alternate years, next offered Fall 1974.)

**Anth. 404 3 Credits Spring**
**Human Variations (2+3)**
Modern human populations, including systematics, behavior, ecology, and inter- and intrapopulation genetic and morphological variations. Human adaptations to heat, cold, high altitude and changing nutritional and disease patterns. (Prerequisites: Anth. 205, Biol. 252, or permission of the instructor. Offered alternate years.)

**Anth. 405 3 Credits Spring**
**Anthropological Genetics (2+3)**
Genetic analysis of discontinuous, quasicontinuous, and continuous biological variants in man: segregation analysis, quantitative genetics, and population genetics. Will also deal with computer simulations of evolutionary processes and phylogenetic

reconstructions. (Prerequisite: Biol. 252, or permission of the instructor. Recommended: A.S. 301 or other statistics course. Offered alternate years, next offered Spring 1976.)

**Anth. 406 4 Credits Spring**
**Primate Anatomy (2+6)**
Each student gains a first hand knowledge of the interrelations and functional significance of the structures of the primate body. The major work of the course consists of dissection of a specified primate and a study of the dentition and osteology. The total anatomical picture is related to the evolution and present ecology of primates. (Prerequisite: Anth. 205, Biol. 107-108, 201 or 317 and permission of the instructor. Offered alternate years or as demand warrants.)

**Anth. 410 3 Credits Fall**
**History of Anthropology (3+0)**
A chronological study of the development of the science of anthropology, stressing the leaders in the field and the theories developed.

**Anth. 423 3 Credits Fall**
**Social Structure (3+0)**
The social systems of native peoples.

**Anth. 424 3 Credits Spring**
**Religion: An Anthropological Approach**
Descriptive and comparative study of religious belief in native societies.

**Anth. 427 3 Credits Fall**
**Contemporary Problems (3+0)**
Analysis of the contemporary problems of the native populations, emphasizing the peoples of Alaska. (Prerequisite: permission of the instructor.)

**Anth. 429 3 Credits Fall**
**Language in Culture (3+0)**
The study of language in its relation to culture. (Prerequisites: Anth. 202 and junior standing.)

**Anth. 430 3 Credits Spring**
**Anthropological Field Methods (3+0)**
Lectures to prepare the student for field work and inform him of recently developed techniques of collecting field data. (Prerequisites: junior standing and permission of the instructor. Offered as demand warrants.)

**Anth. 492 Credits Arr. As Demand Warrants**
**Seminar**
Topics in anthropology.

**Anth. 493 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Anth. 494 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Anth. 497 Credits Arr. As Demand Warrants**
**Individual Study**
(Admission by Arrangement.)

**Anth. 498 Credits Arr. Fall-Spring**
**Research**
Supervised research in the fields of anthropology represented in the department program. (Prerequisite: permission of the instructor.)

**Anth. 499 Credits Arr. Fall-Spring**
**Thesis or Project**
Advanced students who have shown special aptitude for individual study research may elect thesis or project work. (Prerequisite: permission of the head of the department.)

**Anth. 603 3 Credits Spring**
**Proseminar in Anthropology (3+0)**
A seminar for graduate students to review and assess developments in archaeology, physical anthropology, and cultural anthropology. Emphasis will be on the theoretical and methodological aspects of each subdiscipline and the relationships between the three. (Prerequisite: graduate standing in anthropology. Offered each year.)

**Anth. 610 3 Credits Fall**
**Human Ecology (3+0)**
The adaptation of man to his environment, both natural and social. The course concerns itself with the total aspect of a society in its internal group relationship, as well as in the natural environment on which its economy is based.

**Anth. 620 3 Credits Spring**
**Physical Anthropology of North America (2+2)**
Review of pertinent background material. Individual intensive research on a group, tracing biological history, relationships with other living populations, prehistoric migrations, demography, reaction to foreign diseases, micro-evolutionary derivations, and other features. (Prerequisite: Anth. 204 and 205 or 335.)

**Anth. 630 Credits Arr. Spring**
**Anthropological Field Methods**
An opportunity for the graduate student to learn the techniques of field work and practice them.

**Anth. 692 Credits Arr. Fall-Spring**
**Seminar**
Topics include physical and social anthropology, comparative archaeology, ethnological theory. (Admission by arrangement.)

**Anth. 693 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Anth. 694 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Anth. 697 Credits Arr. As Demand Warrants**
**Individual Study**
(Admission by Arrangement.)

**Anth. 698 Credits Arr. As Demand Warrants**
**Research**
Supervised research. Credit to be arranged. (Prerequisites: graduate standing and permission of the instructor. Can be repeated.)

**Anth. 699 Credits Arr. Fall-Spring**
**Thesis**
Offered as demand warrants.

## APPLIED STATISTICS

**A.S. 301 3 Credits Fall-Spring**
**Elementary Probability and Statistics (2+3)**
Descriptive statistics, frequency distributions, mean, median, mode, standard deviation, elementary probability, inferential statistics, estimation of population parameters, tests of hypothesis, including non parametric methods, correlation, linear regression, and analysis of variance. (Prerequisite: Math. 106 or Math 121 and junior standing or consent of instructor.)

**A.S. 401 3 Credits Fall**
**Analysis of Linearized Models (2+3)**
Analysis by methods of least squares of general linearized models, including those appropriate to various designs, including completely random, randomized complete block, incomplete block and latin square, and those for the analysis of variance and analysis of covariance. Matrix algebra appropriate to least squares. (Prerequisite: A.S. 301.)

**A.S. 402 3 Credits Spring**
**Scientific Sampling (2+3)**
Sampling methods, including simple random, stratified and systematic; estimation procedures, including ratio and regression method; special area and point sampling procedures; optimum allocation. (Prerequisite: A.S. 301.)

**A.S. 451 3 Credits Fall**
**Statistics for Civil Engineering (3+0)**
An introduction to the use of probability and statistics in civil engineering design. Probability theory, choice of frequency models, estimation, significance testing, introduction to Bayesion decision making. Application to civil engineering problems. (Prerequisites: Math. 302, junior standing in engineering or physical sciences.)

**A.S. 493 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**A.S. 494 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**A.S. 602 3 Credits Spring**
**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, simple and partially compounded factorial designs, lattice and cubic lattice designs, treatment of missing data, comparison of designs. (Prerequisites: A.S. 401 or consent of instructor. Offered as demand warrants.)

**A.S. 693 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**A.S. 694 Credits Arr. As Demand Warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

## ART

**Art 101 3 Credits Fall**
**Art 102 3 Credits Spring**
**Beginning Ceramics (2+4)**
An introduction to ceramics as a medium for expression. Foundation experiences in clay, glazes, and plaster with lesser emphasis on enamels, concrete, and glass. Terminal course for non-ceramic majors, as well as a base for subsequent courses.

**Art 105 2 Credits Fall**
**Art 106 2 Credits Spring**
**Freehand Drawing (0+4)**
Pictorial design and composition, various contemporary forms of expressions, life drawing, landscape drawing, using varied techniques and media.

**Art 107 2 Credits As demand warrants**
**Art 108 2 Credits As demand warrants**
**Watercolor (1+3)**
Basic investigation of the materials of watercolor and

their use in expressing the student's ideas and problems in the techniques of watercolor.

**Art 161** 3 Credits **Fall**
**Art 162** 3 Credits **Spring**
**Design and Color Theory (2+2)**
Creative designing and rendering. Emphasis on mass-space relationships and composition, value transitions and hues, colorwheel, color, and intensity movements.

**Art 201** 3 Credits **Fall**
**Art 202** 3 Credits **Spring**
**Intermediate Ceramics (2+4)**
A continuation of Basic Ceramics with an emphasis on the potter's wheel and glaze calculations; plaster, as it relates to pottery; an introduction to enameling as a medium for expression; cold glass techniques; basic concrete experiences. (Prerequisite: Art 101-102 or permission of the instructor.)

**Art 203** 1 Credit **Fall**
**Art 204** 1 Credit **Spring**
**Gallery Techniques (1+0)**
Planning and installing art shows.

**Art 205** 2 Credits **Fall**
**Art 206** 2 Credits **Spring**
**Life Drawing and Composition**
Problems in drawing from life, exploring possibilities in pictorial design, and composition, still life and anatomy. (Prerequisite: Art 106 or permission of the instructor.)

**Art 207** 2 Credits **Fall**
**Art 208** 2 Credits **Spring**
**Beginning Printmaking (0+4)**
Various intaglio and relief printing media, engraving, etching, woodcut, and other grahic media. (Prerequisite: Art 106 or permission of the instructor.)

**Art 209** 3 Credits **Fall**
**Art 210** 3 Credits **Spring**
**Beginning Metalcraft (0+6)**
Material processes and techniques for silver jewelry and silversmithng. (Prerequisite: Art 161 or permission of the instructor.)

**Art 211** 3 Credits **Fall**
**Art 212** 3 Credits **Spring**
**Beginning Sculpture (0+6)**
Basic casting techniques, creative studies in clay, wood, stone and metal sculpture. Emphasis on mastery of techniques and material processes.

**Art 213** 3 Credits **Fall**
**Art 214** 3 Credits **Spring**
**Beginning Oil Painting (0+6)**
Basic investigation of materials and their use in expressing the students' ideas. (Prerequisites: Art 106, 162 or permission of the instructor.)

**Art 215** 2 Credits **As demand warrants**
**Weaving (0+6) (Same as H.E. 215)**
The study of various weaving techniques, including the traditional loom weaving, different kinds of primitive weaving, (blackstrap loom, Inko loom, Hungarian loom, etc.); tapestry weaving, macrame and spinning and dyeing yarns. The emphasis will be on individual creativity and experimentation within these techniques.

**Art 261** 3 Credits **Fall**
**Art 262** 3 Credits **Spring**
**History of World Art (3+0)**
Origins of art and its progressive development from the paleolithic era to the present; emphasis on change and development. (Prerequisite: sophomore standing. Term paper required each semester.)

**Art 301** 3 Credits **Fall**
**Art 302** 3 Credits **Spring**
**Advanced Ceramics (2+4)**
Advanced wheel work; design of large scale ceramic murals for incorporation into architecture. Study of the practical application of ceramics in the commercial field. Advanced body and glaze calculation. (Prerequisite: Art 201-202 or permission of the instructor.)

**Art 305** 2 Credits **Fall**
**Art 306** 2 Credits **Spring**
**Advanced Drawing and Anatomy (0+4)**
Creative approach, including a comprehensive study of functional human anatomy, with the human figure as an art motif. (Prerequisite: Art 206 or permission of the instructor.)

**Art 307** 2 Credits **Fall**
**Art 308** 2 Credits **Spring**
**Intermediate Printmaking (0+4)**
Additional study and experimentation in intaglio, relief, and planographic printing techniques, including lithography, serigraphy, and color printing. (Prerequisite: Art 208 or permission of the instructor.)

**Art 309** 3 Credits **Fall**
**Art 310** 3 Credits **Spring**
**Intermediate Metalcraft (0+6)**
Material processes and techniques for silver jewelry and silversmithing; creating problems in artistic design. (Prerequisite: Art 210 or permission of the instructor.)

**Art 311** 3 Credits **Fall**
**Art 312** 3 Credits **Spring**
**Intermediate Sculpture (0+6)**
Creative studies in welding, plaster casting, concrete casting, sand-casting, clay modeling, wood carving, and stone carving. (Prerequisite: Art 212 or permission of the instructor.)

**Art 313** 2 Credits Fall
**Art 314** 2 Credits Spring
**Intermediate Oil Painting (0+4)**
Creating pictorial problems in oil painting techniques, still life, composition, and figure painting. (Prerequisite: Art 214 or permission of the instructor.)

**Art 407** 2 Credits Fall
**Art 408** 2 Credits Spring
**Advanced Printmaking (0+4)**
Advanced study in all printing media. (Prerequisite: Art 308 or permission of the instructor.)

**Art 409** 3 Credits Fall
**Art 410** 3 Credits Spring
**Advanced Metalcraft (0+6)**
Continued investigation and experimentation of intermediate metalcraft. (Prerequisite: Art 310 or permission of the instructor.)

**Art 411** 3 Credits Fall
**Art 412** 3 Credits Spring
**Advanced Sculpture (0+6)**
Styrofoam burn-out, aluminum, bronze casting, steel welding, repousse sculpture, plastics, inlay, and architectural sculpture. (Prerequisite: Art 312 or permission of the instructor.)

**Art 413** 2 Credits Fall
**Art 414** 2 Credits Spring
**Advanced Oil Painting (0+4)**
Exploration and development of the creative approach to various techniques involved in figure, landscape, abstract and non-objective painting, and pictorial design. (Prerequisite: Art 314 or permission of the instructor.)

**Art 419** 3 Credits As demand warrants
**Art 420** 3 Credits As demand warrants
**History of Northern Renaissance Art (3+0)**
Pre-Renaissance painting; sculpture, architecture, and minor arts of the Netherlands through the Netherlandish Renaissance; Renaissance painting in France and Germany; the humanist and reformative influences on artistic developments.

**Art 493** Credits Arr. As demand warrants
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Art 494** Credits Arr. As demand warrants
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Art 497** Credits Arr. As demand warrants
**Individual Study**
(Admission by Arrangement.)

**Art 692** Credits Arr. As demand warrants
**Seminar**

**Art 693** Credits Arr. As demand warrants
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Art 694** Credits Arr. As demand warrants
**Special Topics**
Special topics course approved to be offered on trial basis.

**Art 697** Credits Arr. As demand warrants
**Individual Study**
(Admission by Arrangement.)

**Art 698** Credits Arr. Fall-Spring
**Research**

**Art 699** Credits Arr. Fall-Spring
**Thesis**

## BEHAVIORAL SCIENCES

**B.S. 101** 3 Credits As demand warrants
**Field Observation (2+3)**
Observation experience within a series of three agencies in which an awareness of intake procedures, services provided, and follow-up will be discussed.

**B.S. 201** 3 Credits As demand warrants
**Field Practice (2+3)**
Practical experience within an agency, under the guidance of field supervisors, collecting and interpreting client information. Ways of relating to clients in a therapeutic manner will be developed in the training experience.

**B.S. 220** 3 Credits Fall
**Culture and Learning (3+0)**
Cultural child rearing practices and their effects on learning. Includes acculturation processes and learning factors in early childhood among Alaskan ethnic groups.

**B.S. 251** 3 Credits As demand warrants
**Research Principles (2+3)**
Basic principles of scientific methods, its application to behavioral and social science statistics. The implication of systematic assessment, experimentation and survey methods for empirical conclusions concerning social and behavioral functions and causes.

## BIOLOGY

**Biol. 104** **3 Credits** **Fall**
**Natural History of Alaska (3+0)**
Aspects of the physical environment peculiar to the north and important in determining the biological setting; major ecosystem concepts to develop an appreciation for land use and wildlife management problems in both terrestrial and aquatic situations.

**Biol. 107** **3 Credits** **Fall-Spring**
**Fundamentals of Biology (3+0)**
Basic principles of living systems: chemical and structural bases; major metabolic mechanisms; reproduction and development; genetics; evolution and diversity; environmental relationships; and mechanisms for stability of cells, organisms, and populations. An introductory course open to students in all curricula.

**Biol. 108** **1 Credit** **Fall-Spring**
**Fundamentals of Biology (0+3)**
Laboratory part of Biology 107. Exercises are designed to illustrate principles and concepts developed in Biology 107. (Prerequisites: concurrent registration, or credit in Biol. 107.)

**Biol. 201** **3 Credits** **Spring**
**Mammalian and Human Anatomy (2+3)**
Mammalian gross and microanatomy, with emphasis on human structure. Dissection of cat and comparison with human. (Prerequisite: Biol. 107-108. Offered alternate years; next offered 1976.)

**Biol. 205** **3 Credits** **Spring**
**Vertebrate Anatomy (1+6)**
Anatomy of bony fishes, birds, and mammals. Laboratory dissections emphasized. (Prerequisites: Biol. 107-108 with a grade of B or better, or Biol. 107-108 and sophomore standing. Offered alternate years; next offered 1975.)

**Biol. 206** **2 Credits** **As demand warrants**
**Introduction to Bird Study (1+3)**
Natural history and identification of birds. Early morning field trips. No credit allowed if credit receive d for Biol. 426. (Prerequisites: Biol. 107-108 with a grade of B or better, or Biol. 107-108 and sophomore standing, or permission of the instructor.)

**Biol. 210** **4 Credits** **Fall**
**General Physiology (3+3)**
Organism function, including such topics as respiration, digestion, circulation, nerve and muscle function, hormones, and reproduction. (Prerequisites: Biol. 107-108 with a grade of B or better, or Biol. 107-108 and sophomore standing; Chem. 103 and 104 or concurrent registration in Chem. 105.)

**Biol. 222** **4 Credits** **Spring**
**Biology of the Vertebrates (3+3)**
An introduction to the different groups of vertebrates with emphasis on identification, biogeography, systematics, and basic life history features. (Prerequisites: Biol. 107-108 with a grade of B or better, or Biol. 107-108 and sophomore standing.)

**Biol. 239** **4 Credits** **Spring**
**Plant Form and Function (3+3)**
Structure, function, ecology and evolutionary patterns of the major groups of plants. (Prerequisites: Biol. 107-108 with a grade of B or better, or Biol. 107-108 and sophomore standing.)

**Biol. 242** **3 Credits** **Spring**
**Introductory Microbiology (2+3)**
Survey of the morphology and physiology of microorganisms, including viruses, bacteria and fungi, their role in ecology and their relationship to man. This course is recommended for those lower division students who need a survey-level microbiology course. It is not recommended for pre-professional health-science students. (Prerequisite: Biol. 107-108.)

**Biol. 252** **3 Credits** **Fall**
**Principles of Genetics (3+0)**
Principles of inheritance; physico-chemical properties of genetic systems. (Prerequisites: Biol. 107-108 with a grade of B or better, or Biol. 107-108 and sophomore standing.)

**Biol. 253** **1 Credit** **Fall**
**Principles of Genetics Lab (0+3)**
Laboratory part of Biology 252. Exercises designed to illustrate principles and concepts discussed in Biology 252. (Prerequisite: concurrent registration or credit in Biol. 252.)

**Biol. 271** **3 Credits** **Fall-Spring**
**Principles of Ecology (3+0)**
Relationships between organisms and their environments. Communities, environmental factors affecting plants and animals, population structure, and reaction of organisms. Field trips. (Prerequisites: Biol. 107-108 with a grade of B or better, or Biol. 107-108 and sophomore standing.)

**Biol. 305** **4 Credits** **Fall**
**Invertebrate Zoology (3+3)**
Structure, function, classification, evolution and life histories of invertebrate animals. (Prerequisites: Junior standing and at least eight credits in Biology, including Biol. 107 and 108, or permission of the instructor.)

**Biol. 306** **3 Credits** **As demand warrants**
**Entomology (2+3)**
Natural history and identification of insects and arachnids. Preregistration required to insure

preparation of individual insect collection. (Prerequisite: Biol. 107-108. Offered as demand warrants.)

**Biol. 307 3 Credits Fall**
**Parasitology (2+3)**
Classification, morphology, life history, and ecology of parasites of animals. (Prerequisites: Biol. 107-108 and permission of instructor.)

**Biol. 308 3 Credits Fall**
**Principles of Evolution (3+0)**
An introduction to the mechanisms of, and evidence for, the evolution of living systems. The coding and transmission of genetic information in populations, population variability, change and stabilization. (Prerequisites: Biol. 107-108, Biol. 252, Biol. 271 or permission of the instructor.)

**Biol. 317 5 Credits Spring**
**Comparative Anatomy of Vertebrates (2+9)**
Anatomy, phylogeny, and evolution of the vertebrates. (Prerequisites: Biol. 107-108 with a grade of B or better, or Biol. 107-108 and sophomore standing.)

**Biol. 318 4 Credits Spring**
**Vertebrate Developmental Anatomy (2+6)**
Morphogenesis of the vertebrates and introduction to the causal analysis of development. (Prerequisite: Biol. 317. Offered alternate years; next offered 1975.)

**Biol. 328 3 Credits Spring**
**Biology of Marine Animals (3+0)**
Introduction to biology of marine organisms; ocean as a habitat, distribution, classification, functional morphology, and general biology of the major biological groups; man and the oceans. (Prerequisite: Upper division standing in a biologically oriented major. Offered alternate years; next offered 1976.)

**Biol. 331 4 Credits Spring**
**Systematic Botany (2+6)**
Identification and classification of vascular plants with emphasis on Alaskan flora; discussion of taxonomic principles aand both classical and experimental methods of taxonomic research. Preregistration is required to insure that each student will prepare a plant collection. (Prerequisite: Biol. 239, or permission of the instructor. Biol. 252 recommended.;)

**Biol. 333 3 Credits Fall**
**Morphology of the Non-Vascular Plants (2+3)**
Comparative study of structure, development, phylogenetic trends, and life histories of the major groups of algae, fungi, and bryophytes. (Prerequisite: Biol. 239. Offered alternate years; next offered 1974.)

**Biol. 334 4 Credits Fall**
**Morphology and Anatomy of Vascular Plants (3+3)**
Comparative study of morphology, developmental anatomy, phylogenetic trends, and life histories of the major groups of vascular plants. (Prerequisite: Biol. 239. Offered alternate years; next offered 1975.)

**Biol. 343 5 Credits Fall**
**General Bacteriology (3+6)**
Morphology, physiology, and systematics of bacteria and viruses and their relationship to man. Introduction to concepts of immunology and epidemiology. Recommended for health sciences students and others desiring more in-depth knowledge of bacteria and basic microbiological techniques. (Prerequisites: Credit or concurrent registration in Chem. 321, or permission of the instructor.)

**Biol. 352 3 Credits Fall**
**Cytogenetics (2+3)**
Cell structure emphasizing the role of chromosomes in the differentiation and development of plants and animals. (Prerequisites: Biol. 252 or permission of the instructor.)

**Biol. 354 3 Credits Spring**
**Genetics of Microorganisms (2+3)**
Modern concepts of microbial genetics, including basic genetic theory, growth and macromolecular synthesis, the genetic code, mutation and selection, genetic exchange mechanisms, accessory genetic elements (extrachromosomal) and control mechanisms. (Prerequisites: Biol. 252, Biol. 242 or permission of the instructor. Offered alternate years; next offered 1975.)

**Biol. 361 3 Credits Spring**
**Cell Biology (3+0)**
Detailed structure, including ultrastructure, and function of the cell; isolation, composition, and biochemical properties of cell organelles and their integration. (Prerequisites: A year each of college chemistry and biology.)

**Biol. 362 1 Credit Spring**
**Cell Biology Lab (0+3)**
Laboratory part of Biol. 361. Exercises designed to explore the biochemical basis of cellular biological phenomena. (Prerequisites: Concurrent registration or credit for Biol. 361, or concurrent registration or credit for Chem. 452.)

**Biol. 401 30 Credits Fall**
**Medical Technology**
Twelve-month medical technology internship at an affiliated hospital school, including work in clinical chemistry, hematology, microbiology, serology, parasitology, and histologic technique. (Prerequisites: senior standing in medical technology curriculum with

the prior two semesters having been in residence at the University of Alaska; acceptance by an affiliated school of medical technology.)

**Biol. 414 4 Credits Spring**
**Comparative Physiology (3+3)**
Functional variations and interrelationships among the major animal phyla; includes ionic and osmotic regulation, temperature regulation, metabolism, excretion, respiration, cardiovascular systems, nerve and muscle function. (Prerequisites: Biol. 210, Chem. 106; Chem. 223 or 321 and Biol. 361 recommended Offered alternate years; next offered 1976.)

**Biol. 416 3 Crdits Spring**
**Plant Physiology (2+3)**
Functions of the vascular plants; plant-soil-water relations; synthesis and metabolism of organic compounds; growth and development. (Prerequisites: Biol. 210, Chem. 106, Chem. 223 or 321 and Biol. 361 recommended. Offered alternate years; next offered 1976.)

**Biol. 423 4 Credits Fall**
**Ichthyology (3+3)**
Major groups of fishes, amphibians and reptiles, with emphasis on forms found in northwestern North America. Classification, evolution, structure and importance to man of the major groups. (Prerequisites: Biol. 222; Biol. 317 recommended, or permission of the instructor.)

**Biol. 425 3 Credits Fall**
**Mammalogy (2+3)**
Variety of mammals, their behavior, life histories, identification, phylogeny and systematics, morphology, distribution and zoogeography. (Prerequisites: 20 credits in Biology, including Biol. 222 and Biol. 205 or 317, or permission of instructor.)

**Biol. 426 3 Credits Spring**
**Ornithology (2+3)**
Structure and adaptation, ecology, behavior, life histories, distribution, and classification of birds. Early morning field trips. (Prerequisites: 20 credits in Biology, including Biol. 222 and Biol. 205 or Biol. 317 or permission oof instructor.)

**Biol. 441 3 Credits Spring**
**Principles of Animal Behavior (2+3)**
Basic principles (causal factors and functional consequences) in the behavior of individual organisms and social groups, and in the development of behavior patterns. (Prerequisites: Biol 210, 222 and 305.)

**Biol. 443 3 Credits Fall**
**Microbial Ecology (1+6)**
Laboratory investigation of ecological activity and impact of bacteria and fungi. Isolation and study of important genera. (Prerequisites: Biol. 343; or Biol. 242 and Biol. 271; or consent of instructor. Offered alternate years; next offered 1976.)

**Biol. 462 4 Credits Spring**
**Developmental Biology (3+3)**
Principles of developmental biology and differentiation; emphasis on systems employed for experimental studies. (Prerequisites: Biol. 361 or Chem. 451 or consent of instructor; Biol. 318 recommended. Offered alternate years; next offered 1976.)

**Biol. 474 3 Credits Fall**
**Plant Ecology (2+3)**
Occurrence, abundance and productivity of plant species under field conditions; structure, composition and variations in time and space of plant communities; relative environmental aspects; methods of analysis. (Prerequisites: Biol. 239 and 271 or permission of instructor.)

**Biol. 476 4 Credits Spring**
**Animal Ecology (4+0)**
Principles and concepts of ecology as applied to animal populations, including distribution and abundance, growth and regulation of populations, their role in the functioning of natural ecosystems, ecological energy relationships, and the organization of natural communities. (Prerequisites: Biol. 271 and Biol. 222 or 305, or permission of instructor.)

**Biol. 478 2 Credits Spring**
**Field Ecology (0+3)**
An intensive experience in the collection and interpretation of ecological data. The course consists of a field trip during spring break. Students will engage in the design, execution, and analysis of field projects dealing with various aspects of ecology. (Prerequisites: Biol. 271 and Biol. 474 or Biol. 476 [may be taken concurrently], and permission of instructor. Students will be expected to share in expenses.)

**Biol. 492 Credits Arr. Fall-Spring**
**Seminar**
Topics in biological sciences.

**Biol. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Biol. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Biol. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Biol. 498 Credits Arr. Fall-Spring**
**Research**
Guided investigation, either laboratory or field, for qualified seniors. (Admission by arrangement.)

**Biol. 615 1 Credit As demand warrants**
**History of Biology (1+0)**
The progress of biological thought and philosophy from ancient to modern times.

**Biol. 616 3 Credits Spring**
**Principles and Methods of Taxonomy (2+3)**
Modern taxonomic ideas and their application to zoological and botanical problems. (Offered alternate years; next offered 1975.)

**Biol. 618 2 Credits Spring**
**Biogeography (2+0)**
Spatial and temporal geography of plant and animal groups; emphasis on environmental and historical features controlling present patterns of distribution. (Offered alternate years; next offered 1976.)

**Biol. 627 3 Credits Spring**
**Physiological Ecology (2+3)**
A study of those physiological processes primarily involved in the interaction of animals with their environment. Special emphasis will be placed on northern habitats. (Prerequisites: a physiology course and Biol. 271. Offered alternate years; next offered 1975.)

**Biol. 629 3 Credits**
**Advanced Animal Behavior (3+0)**
Adaptive nature of behavior in relation to the physical, biological, and social environment. Current problems and controversies in the study of behavior. (Prerequisites: Biol. 441 and permission of the instructor. Offered alternate years; next offered 1975.)

**Biol. 637 2 Credits Fall**
**Modern Evolutionary Theory (2+0)**
Contemporary ideas and problems of the mechanics of evolution.

**Biol. 641 3 Credits As demand warrants**
**Microbial Physiology (2+3)**
The principal types of autotrophic and heterotrophic microbial metabolism. Photosynthesis, nitrogen fixation, metabolism of iron and sulfur bacteria. Fermentation, respiration, biosynthetic pathways. (Prerequisites: Biol. 343; Chem. 452 or permission of the instructor.)

**Biol. 650 3 Credits Spring**
**Physiological Genetics (2+3)**
Development and metabolism in relation to and under the control of genotypes. (Prerequisites: Biol. 252, Biol. 361 and Chem. 321 or permission of instructor; Chem. 451 recommended. Offered alternate years; next offered 1975.)

**Biol. 652 3 Credits Spring**
**Marine Ecology (3+0)**
The sea as a biological environment; organisms in the ocean; factors influencing the growth of organisms; nutrient cycles; productivity; food web and interdependence of organisms; several field trips may be required. (Prerequisites: Biol. 271, Chem. 212, 322; Geol. 411 or permission of the instructor. Offered alternate years; next offered 1976.)

**Biol. 674 3 Credits Spring**
**Advanced Plant Ecology (2+3)**
Current concepts, controversies, and advances in plant ecology; emphasis on community-level ecology, methods of classification and ordination, and recent literature. (Prerequisite: Biol. 474. Offered alternate years; next offered 1976.)

**Biol. 692 Credits Arr. Fall-Spring**
**Seminar**
Topics in biological sciences. (Offered as demand warrants.)

**Biol. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Biol. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Biol. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by Arrangement.)

**Biol. 698 Credits Arr. Fall-Spring**
**Research**
Investigation, either field or laboratory, of a problem of lesser scope than the thesis, or supplementary to the thesis. (Admission by arrangement.)

**Biol. 699 Credits Arr. Fall-Spring**
**Thesis**
(Admission by arrangement.)

## BROADCASTING

**Brd. 100, 200, 300, 400 1 Credit Fall-Spring**
**Radio Operations (0+3)**
Training in practical radio operations. Participation on KUAC staff required. May be repeated for a maximum of four credits.

**Brd. 211 3 Credits Fall-Spring**
**Introduction to Broadcasting (3+0)**
A survey of radio and television, with emphasis on the history, financing, regulation, and operation of the broadcasting industry.

**Brd. 213 2 Credits Fall-Spring**
**Announcing (1+2)**
Microphone techniques, role of the announcer in broadcasting. Fundamentals of announcing; their practical application. (Prerequisite: Sp.C. 111 or admission by arrangement.)

**Brd. 215 3 Credits Fall-Spring**
**Radio Broadcast Production (2+3)**
Use of studio equipment; radio production techniques; tape editing.

**Brd. 216 3 Credits Spring**
**Television Production (2+4)**
Basic aspects of television production; floor directing, audio, camera, film chain, staging, lighting, switching.

**Brd. 217 3 Credits Fall-Spring**
**Writing for Radio and Television (3+0)**
Preparation of announcements, interviews, music continuity, special events programs, documentaries, commentaries, news, and other basic radio and television continuity.

**Brd. 331 3 Credits Fall-Spring**
**Radio-Television Advertising (2+3)**
Academic approach to econmics and standards of radio and television advertising. Special emphasis on ethical considerations involved in the preparation and presentation of commercial broadcast copy. (Prerequisite: Brd. 217 or permission of the instructor.)

**Brd. 341 3 Credits Fall-Spring**
**Radio-Television News (2+4)**
Responsible news writing, editing, processing and delivery for the broadcast media. Special emphasis on ethical considerations in broadcast journalism. (Prerequisite: Brd. 217 and Jour. 201 or by permission.)

**Brd. 371 3 Credits Every third semester**
**Educational Broadcasting (3+0)**
The foundations of educational broadcasting, financing, ownership; programming various educational media: PTV, ITV, P-RADIO, CCTV. Educational broadcasting's role in the U.S.

**Brd. 372 3 Credits Every third semester**
**Methods of Instructional Broadcasting (2+4)**
Studio practices and procedures for the production of instructional programs. Underlying educational philosophy and actual in-studio practice.

**Brd. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Brd. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Brd. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

## BUSINESS ADMINISTRATION

**B.A. 151 3 Credits Fall-Spring**
**Introduction to Business (3+0)**
Business organization, nature of major business functions such as management, finance, accounting, marketing, personnel administration. The opportunities and requirements for professional business careers.

**B.A. 165 3-4 Credits Fall-Spring**
**Business Administration for Technicians**
A survey of core areas of business administration with particular emphasis upon organization and operation of small and middle-scale businesses. Business law, personal finance, manufacturing, marketing and finance at the introductory level. An introduction to business enterprise for non-business majors.
(Prerequisites: Associate degree or freshman standing, except that credit may not be counted toward the four-year degrees in business and economics.)

**B.A. 230 3 Credits Fall**
**Business in American History (3+0)**
**(Same as Hist. 230)**
A survey of American business leadership from 1790 to 1960. Dynamic business leaders, their contributions to business techniques, their problems with governmental controls, and their impact on American history will be examined. (Prerequisite: Hist. 132 or consent of instructor.)

**B.A. 231 3 Credits Fall**
**Business Communications (3+0)**
**(Same as O.A. 231)**
Applies the techniques of written communications to situations that require problem solving and an understanding of human relations. Emphasis on clarity, accuracy, and effectiveness in composing and evaluating various kinds of communications that commonly pass between a businessman and his associates, customers, and dealers. Included will be inter-office memos, letters, reports. (Prerequisites: Engl. 111 and ability to type.)

**B.A. 243** **3 Credits** **Fall**
**Principles of Marketing (3+0)**
Role of marketing in society and economy. The business firm as a marketing system, management of the firm's marketing effort. (Prerequisite: Econ. 121, 122.)

**B.A. 253** **1 Credit** **Fall**
**B.A. 254** **1 Credit** **Spring**
**Business Practicum (0+1)**
Work experience in an approved position with supervision and training in various phases of a business or institute. No student can receive more than eight (8) credits for work experience course of the practice or internship type. (Prerequisite: Permission of the head of the department.)

**B.A. 280** **3 Credits** **Fall**
**Processes of Management (3+0)**
Techniques in effective administration or organizations including both theory and application in managerial processes. The primary process of planning, key to success of other processes of management that follow. Effective organization of work elements, study of classical forms of organizational structure as well as acceptance theory. Elements of the decision making process including quantitaitive techniques used in direction and control.

**B.A. 292** **3 Credits** **Spring**
**Introduction to Data Processing (3+0)**
**(Same as O.A. 292.)**
Introduction to data processing. Related management.

**B.A. 302** **3 Credits** **Fall-Spring**
**Advanced Leadership (3+0) (Same as Mil. 302)**
A comprehensive analysis of leadership and leadership styles centering upon the appointed leadership environment applicable to formal organizations of business and the military. Emergent leadership considerations and variables are also examined. A variety of guest speakers representative of a cross-section of leadership experience are included dependent up local resources and availability.

**B.A. 303** **3 Credits** **Fall-Spring**
**Advanced Leadership (3+0) (Same as Mil. 303)**
Comprehensive anaylsis of leadership styles and functions applicable to formal organizations. Lab: Advanced leadership development including enrichment seminars. (Prerequisite: junior standing as a minimum.)

**B.A. 325** **3 Credits** **Fall**
**Financial Management (3+0)**
Intensive analysis of the methods of financial planning and control, asset management, and other functions performed by the financial executive.

**B.A. 326** **3 Credits** **Spring**
**Principles of Advertising (3+0)**
**(Same as Jour. 326)**
Theory and practice of advertising; including strategy, media use, creation and production of advertisements and measurement of advertising effectiveness.

**B.A. 331** **3 Credits** **Fall**
**B.A. 332** **3 Credits** **Spring**
**Business Law (3+0)**
Survey of the legal aspects of business problems; basic principles, institutions, and administration of law. Fall semester: contracts, agency, employment, negotiable instruments, and personal property sales. Spring semester: insurance, suretyship, partnerships, corporations, real property trusts, wills, bankruptcy, torts and business crimes. (Prerequisite: junior standing or permission of instructor.)

**B.A. 359** **3 Credits** **Fall-Spring**
**Regulation of Industry (3+0)**
Effects of government regulation, economic policy and executive policy and executive policy on private and public enterprise.

**B.A. 360** **3 Credits** **Fall**
**Production Management (3+0)**
Basic manufacturing management. Survey of models and representative problems including scheduling machine set-up, plant layout, capital budgeting and production control. (Prerequisite: junior standing.)

**B.A. 361** **3 Credits** **Spring**
**Industrial Relations (3+0)**
Personnel practice in industry; analysis of labor-management problems; methods and administrations of recruiting, selecting, training and compensating employees; labor laws and their applications. (Preequisite: Psy. 101 and Soc. 101.)

**B.A. 371** **3 Credits** **Fall**
**Business Data Processing (3+0)**
An analysis of computer based management information systems. COBOL will be taught and used. Required for all business administration majors. (Prerequisite: CIS 101.)

**B.A. 372** **3 Credits** **Spring**
**Advanced Fortran Programming (3+0)**
Advanced Fortran techniques and applications. Use of magnetic tapes and discs will be covered. Applications will include programming of subroutines, statistical procedures and an introduction to simulation. (Prerequisites: Econ. 221 and CIS 101 or equivalent programming background.)

**B.A. 409** **3 Credits** **Fall**
**Industrial Organization and Public Policy (3+0)**
**(Same as Econ. 409)**
The study of the relationship of market structure to the

economic conduct and performance of firms and industries; the determinants, measurement and classification of market structure; public policy toward mergers, industrial concentration and aggregate concentration. (Prerequisites: Econ. 121, 122 and 321.)

**B.A. 423 3 Credits Fall-Spring**
**Investment Management (3+0)**
Management securities, portfolios of individuals and institutions; basic security analysis; investment policies of banks, insurance companies, investment companies, and fiduciaries. (Prerequisite: B.A. 325.)

**B.A. 425 3 Credits Spring**
**Advanced Corporate Financial Problems (3+0)**
A consideration of corporate financial problems, planning and controls, and major functions performed by corporate financial managers. (Prerequisite: B.A. 325.)

**B.A. 443 3 Credits Spring**
**Marketing and Analysis of Retailing Management (3+0)**
Factors influencing behavior of consumer and business units behavior change. The management of retailing functions in marketing; application of management principles in marketing system analysis and control. (Prerequisite: B.A. 343.)

**B.A. 444 3 Credits Spring**
**Industrial Marketing (3+0)**
Analysis of the marketing structure for industrial products. Product lines, channels of distribution, selling, pricing, warehousing and wholesaling problems. (Prerequisite: B.A. 343.)

**B.A. 445 3 Credits Spring**
**Marketing Research (3+0)**
Objective is to familiarize students with the basic processes and tools of marketing research with emphasis on utilization of research findings as an integral part of the managerial decision-making process. Students will apply techniques of data-gathering and analysis to a marketing problem.

**B.A. 462 3 Credits Spring**
**Administrative Policy (3+0)**
In-depth case study work analyzing companies' administrative policies with respect to marketing, finance, accounting, marketing segmentation between industries, and policy differences within industries.

**B.A. 475 3 Credits Spring**
**Transportation and Logistics (3+0)**
The essential focus of teaching and research in transportation is on systems planning, especially multimode systems. The program builds upon basic knowledge of the properties of transportation systems components, and the ability to analyze interactions among these components and between the transportation system and its environment. Special consideration will be given to Alaskan transportation problems by experienced specialists. (Prerequisite: Econ. 221.)

**B.A. 480 3 Credits Fall-Spring**
**Organization Theory (3+0)**
Literature of organizational theory; emphasis on theoretical concepts, social science research techniques and organizational behavior. (Prerequisites: B.A. 361 and 380.)

**B.A. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an acadmic year.

**B.A. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**B.A. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**B.A. 648 3 Credits Spring**
**Mathematica l Method and Computers Workshop (3+0)**
Selected topics in the use of mathematical models, econometric techniques and computers in marketing; individual research projects. (Prerequisite: permission of the instructor.)

**B.A. 690 3 Credits Fall**
**Seminar in Finance (3+0)**
Survey of financial institutions and markets with emphasis upon theory and practice of central banking and actual operation of monetary policy. Current problems in finance. (Prerequisites: post-graduate or graduate standing. Approval of graduate student's advisory committee or the department head.)

**B.A. 691 3 Credits Fall**
**Seminar in Marketing (3+0)**
A survey of marketing institutions, systems, policies and practices. Review of marketing constituents in economic development, marketing theory and current problems. (Prerequisites: post-graduate or graduate standing. Approval of graduate student's advisory committee or the department head.)

**B.A. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**B.A. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**B.A. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangements.)

**B.A. 696 3 Credits Spring**
**Orientation to Research (3+0)**
The basic tools of research methodology from problem selection and formulation to presentation of research results with major emphasis on survey research techniques. Special attention is given to preparing students for thesis requirements. In order to obtain maximum benefit from the course, it should be taken as early as possible in the student's graduate program. (Prerequisites: Post graduate or graduate standing. Approval of graduate student's advisory committee or the department head.)

**B.A. 699 Credits Arr. Fall-Spring**
**Thesis**

## CHEMISTRY

**Chem. 103 4 Credits Fall**
**Chem. 104 4 Credits Spring**
**Contemporary Chemistry (3+3)**
Descriptive courses with laboratory designed to provide orientation in chemistry for students in non-science and science related curricula. Either semester may be taken separately without prerequisites. Chem. 103: Introductory principles of inorganic chemistry and their applications. Chem. 104: Principles and applications of the chemistry of carbon in a modern economic, social and biological context.

**Chem. 105 4 Credits Fall**
**Chem. 106 4 Credits Spring**
**General Chemistry (3+3)**
An introduction to chemistry, including atomic and molecular structure; the principles of chemical change and related energy changes. Chemistry 106 includes the chemistry of the elements. (Prerequisite: High school chemistry or permission of the instructor. For Chem. 106, Chem. 105 is required.)

**Chem. 195 Credits Arr. Fall**
**Chem. 196 Credits Arr. Spring**
**Freshman Tutorial**
Participation in seminar, individual projects, or other activities offered by the department to provide further opportunities for experience in the discipline. Enrollment limited to students with freshman standing.

**Chem. 211 4 Credits Fall**
**Chemical Principles (3+3)**
An intensive, systematic study of the laws and concepts of chemistry, with considerable emphasis on mathematical aspects. Laboratory work will include both qualitative and quantitative procedures. (Prerequisites: High school chemistry or Chem. 103-104 and satisfactory performance on an advanced placement examination given three weeks into the semester, with Math. 200 at least corequisite. Four advanced placement credits may be given upon completion of Chem. 211 with a grade of C or better.)

**Chem. 212 4 Credits Spring**
**Introductory Quantitative Analysis (2+6)**
The theoretical treatment of statistics, electrochemistry, and spectroscopic methods. A rigorous treatment of acid-base, oxidation - reduction, and complex equilibria. The laboratory includes practice in volumetric, gravimetric, spectroscopic and electrochemical methods. (Prerequisites: Chem. 106 or 211, Math. 106 or equivalent.)

**Chem. 223 4 Credits Fall**
**Introductory Organic Chemistry (4+0)**
An integrated, intensive, one-semester study of aliphatic and aromatic organic compounds, their occurrence, methods of preparation, reactions, and uses. (Prerequisite: Chem. 106 or 211.)

**Chem. 321 3 Credits Fall**
**Chem. 322 3 Credits Spring**
**Organic Chemistry (3+0)**
A systematic study of the more important classes of carbon compounds, reactions of their functional groups, methods of synthesis, relations, and uses. (Prerequisite: Chem. 106 or 211 for Chem. 321; Chem. 321 for Chem. 322.)

**Chem. 324 3 Credits Spring**
**Organic Laboratory (1+8)**
A laboratory course designed to illustrate modern techniques of isolation, purification, analysis, and structure determination of covalent, principally organic, compounds. (Prerequisites: Chem. 223 or 321 or permission of the instructor.)

**Chem. 331 3 Credits Fall**
**Chem. 332 3 Credits Spring**
**Physical Chemistry (3+0)**
Fall semester: kinetic theory of gases, principles of thermodynamics, with applications to solutions, phase equilibria and chemical equilibria. Spring semester: chemical kinetics, electrochemistry, atomic, and molecular structure. (Prerequisites: Chem. 106 or 211, Math. 202, Phys. 104 or 106 or permission of the instructor; Chem. 331 for Chem. 332.)

**Chem. 362 1 Credit Spring**
**Scientific Glassworking (0+3)**
Construction of scientific glassware. (Prerequisite: junior standing in chemistry or permission of the instructor.)

**Chem. 402 3 Credits Spring**
**Inorganic Chemistry (3+0)**
Systematic application of the theories of atomic structure and chemical bonding to the elements as they appear in the Periodic System. (Prerequisite or corequisite: Chem. 332.)

**Chem. 421 3 Credits Fall**
**Advanced Organic Chemistry (3+0)**
The theoretical interpretation of organic structure and reactions. (Prerequisites: Chem. 322, 332.)

**Chem. 425 3 Credits Fall**
**Advanced Organic Laboratory (1+8)**
A laboratory course in the application of modern techniques to the rational synthesis of covalent organic and inorganic compounds. (Prerequisites: Chem. 223 or 322 and Chem. 324 or permission of the instructor. A reading knowledge of German is recommended.)

**Chem. 431 3 Credits Fall**
**Advanced Physical Chemistry (3+0)**
Introduction to quantum chemistry and statistical thermodynamics. (Prerequisite: Chem. 332.)

**Chem. 433 3 Credits Fall**
**Chem. 434 3 Credits Spring**
**Instrumental Methods in Chemistry (1+6)**
The application of instrumental methods to quantitative, qualitative, and structural analysis of chemical systems. (Prerequisite or Corequisite: Chem. 331 for Chem. 433; Chem. 332 for Chem. 334.)

**Chem. 451 Credits Arr. Fall**
**Chem. 452 Credits Arr. Spring**
**General Biochemistry**
Fall semester: chemistry of protein, enzymes; photosynthesis; carbohydrate biosynthesis; oxidative metabolism of carbohydrates, fatty acids and amino acids. Spring semester: biosynthesis of lipids, amino acids and nucleic acids; biochemical genetics; the genetic code, biosynthesis of protein, metabolic controls. (Prerequisite: Chem. 322; Chem. 331 and 332 recommended or permission of the instructor.)

**Chem. 492 0 or 1 Credit Fall-Spring**
**Seminar (1+0)**
Discussion of current literature.

**Chem. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Chem. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Chem. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Chem. 498 Credits Arr. Fall-Spring**
**Research**
Introduction to research at the undergraduate level. (Admission is by permission of the instructor.)

**Chem. 602 3 Credits Spring**
**Advanced Inorganic Chemistry (3+0)**
Advanced topics in inorganic chemistry. Topic Areas: Solid state chemistry, X-ray diffraction, thermodynamic aspects, physical methods, unusual oxidation states, etc. (Prerequisite: Chem. 402 or 431.)

**Chem. 612 3 Credits Fall**
**Advanced Analytical Chemistry (3+0)**
Applications of equilibria and statistics to analytical methods. (Prerequisite: Chem. 332.)

**Chem. 622 3 Credits Spring**
**Advanced Organic Chemistry II (3+0)**
Modern interpretations of organic chemical reactions based on structure, kinetics, and energetics. (Prerequisites: Chem. 322, 332, 421. Offered in alternate years.)

**Chem. 632 3 Credits Spring**
**Advanced Physical Chemistry II (3+0)**
Applications of quantum mechanics to molecular bonding and electronic spectroscopy. (Prerequisite: Chem. 431.)

**Chem. 633 3 Credits Spring**
**Spectroscopy and Molecular Structure (3+0)**
Introduction to the rotational, vibrational, and magnetic resonance spectroscopy of polyatomic molecules. (Prerequisite: Chem. 431.)

**Chem. 651 3 Credits Fall**
**Chem. 652 3 Credits 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. Arranged in consultation with instructor. (Prerequisites: Chem. 451 and 452 or equivalent.)

**Chem. 661 3 Credits Fall-Spring**
**Chemical Oceanography I (3+0)**
**(Same as OCE 661)**
Chemical composition and properties of sea water; evaluation of salinity; pH, excess base, and carbon

dioxide system, interface reactions; dissolved gases; organic components and trace inorganic components. (Prerequisites: Chem. 212, 322, 332, or permission of the instructor.)

**Chem. 663** **3 Credits** **Fall-Spring**
**Chemical Oceanography II (3+0)**
**(Same as OCE 663)**
Selected topics in chemical oceanography, including stable isotope chemistry; chemical equilibria; chemistry of marine biota and their products; interaction of sediments and water; material exchange through sea air interface; marine photosynthesis and special topics of marine biochemistry; chemical technology as applied to oceanography; raw materials and industrial utilization. (Prerequisite: Chem. 661, or permission of the instructor. Offered in alternate years.)

**Chem. 665** **2 Credits** **Fall-Spring**
**Cellular Biochemistry (2+0)**
Chemistry, structure and metabolism of microorganisms including growth kinetics and energetics, transport and control processes. (Prerequisite: Chem. 452 or equivalent. Offered in alternate years.)

**Chem. 692** **1 Credit** **Fall-Spring**
**Seminar (1+0)**
Reviews of current research.

**Chem. 693** **Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Chem. 694** **Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Chem. 697** **Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Chem. 698** **Credits Arr.** **Fall-Spring**
**Research**
Research which is not rectly connected with thesis work. (Admission by arrangement and permission of the department head.)

**Chem. 699** **Credits Arr.** **Fall-Spring**
**Thesis**

## CIVIL ENGINEERING

**C.E. 112** **3 Credits** **Spring**
**Elementary Surveying (2+3)**
Use of transit, level and plane table, stadia, circular curves, elementary theory of measurement. Public land system. (Prerequisite: E.S. 111.)

**C.E. 116** **3 Credits** **Spring**
**Mapping (2+3)**
Maps and scales, projections, U.S. Public Land System, aerial photos with special applications to forestry and wildlife management. Plane tables, compasses, stadia, levels, transits, traverses. Intended primarily for students in wildlife management. (Prerequisite: junior standing or permission of the instructor. Offered in alternate years, next offered 1975.)

**C.E. 334** **3 Credits** **Spring**
**Properties of Materials (1+6)**
Introduction to the properties of engineering materials. Bonding, crystal, and amorphous structures. Relationships between microstructure and engineering properties. Modification of properties and environmental serviceability.

**C.E. 344** **3 Credits** **Spring**
**Water Resources Engineering (2+2)**
Fundamentals of engineering hydrology and hydraulic engineering. Precipitation, runoff, statistical methods, flood control, open channels, and groundwater. (Prerequisite: E.S. 341.)

**C.E. 402** **2 Credits** **Spring**
**Transportation Engineering (2+0)**
Administration, economics, location, design, construction and maintenance of highways, railways, airports and other transportation facilities. (Prerequisite: C.E. 435 or permission of the instructor.)

**C.E. 412** **3 Credits** **Spring**
**Elements of Photogrammetry (2+3)**
Elementary study of aerial and terrestrial photographs as applied to surveying and mapping. (Prerequisite: permission of the instructor. Offered in alternate years, next in 1976.)

**C.E. 415** **3 Credits** **Fall**
**Advanced Surveying (2+3)**
Traverses, curves, field astronomy, state coordinate systems, adjustments. (Prerequisite: C.E. 112.)

**C.E. 416** **1 Credit** **Spring**
**Boundary Surveying (1+0)**
Surveying problems related to land subdivision. Both metes and bounds descriptions and platted subdivisions are considered. Strongly recommended for those who wish to practice land surveying. (Prerequisite: C.E. 415 or other surveying experience acceptable to the instructor.)

**C.E. 422** **2 Credits** **Spring**
**Foundation Engineering (2+0)**
Principles of foundation action, spread footings, mats, pile foundations, retaining walls and bulkheads, bridge

piers, cofferdams and abutments. (Prerequisite: C.E. 435.)

**C.E. 431 4 Credits Spring**
**Structural Analysis (3+3)**
Statically determinate structures. Loadings. Graphical and analytical solutions stresses and deflections. Indeterminate structures. Influence lines. (Prerequisite: E.S. 331.)

**C.E. 432 4 Credits Spring**
**Structural Design (3+3)**
Planning of structural systems, detail connections. Reinforced concrete. Introduction to ultimate load theory. Prestressing. Composite action. (Prerequisite: C.E. 431.)

**C.E. 435 3 Credits Fall**
**Soil Mechanics (2+3)**
Identification, description, and physical properties of soils. Subsurface exploration, frost action. Entire soil mass surveyed for effect on substructure design. (Prerequisites: E.S. 331, C.E. 334.)

**C.E. 438 3 Credits Spring**
**Design of Engineered Systems (3+0)**
Introduction to system design methods for large scale engineering systems. The application of linear and dynamic programming and statistical methods to design decisions. Emphasis on problems in civil engineering. (Prerequisite: Senior standing in an engineering program.)

**C.E. 441 4 Credits Fall**
**Sanitary Engineering (3+3)**
Introduction to fundamentals of environmental engineering including theory and application of water and wastewater engineering practice. Conservation, quality, treatment, and distribution of water supply. Wastewater characteristics, collection, treatment and disposal. Introductory information on solid waste management and air pollution control. (Prerequisite: E.S. 341 or permission of instructor.)

**C.E. 492 Credits Arr. Fall-Spring**
**Seminar**

**C.E. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**C.E. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**C.E. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**C.E. 603 3 Credits Fall**
**C.E. 604 3 Credits Spring**
**Arctic Engineering (3+0)**
Application of engineering fundamentals to problems of advancing civilization in polar regions. Logistics, foundations on frozen ground and ice, thermal aspects of structures and materials transport and communications; heating and ventilating. (Prerequisite: Graduate standing or permission of the instructor.)

**C.E. 611 3 Credits As demand warrants**
**C.E. 612 3 Credits As demand warrants**
**Transportation Engineering (3+0)**
Land, air, and marine transportation, facilities, design, utilization, planning, and administration.

**C.E. 615 3 Credits As demand warrants**
**Transportation Design (1+6)**
Primarily a laboratory course in pavement and embankment design.

**C.E. 617 3 Credits Fall**
**Control Surveys (3+0)**
Geodetic surveying, where the shape of the earth must be considered. Both horizontal and vertical control will be studied. Adjustments of level nets, traverses, triangulation, and trilateration. (Prerequisites: C.E. 415 or other surveying experience acceptable to the instructor. Offered alternate years. Next offered 1975.)

**C.E. 618 3 Credits As demand warrants**
**Transportation Planning**
Future design problems with special emphasis on mass transit and mode interconnection. (Prerequisite: C.E. 611 or enrollment in C.E. 612.)

**C.E. 620 3 Credits Spring**
**Civil Engineering Construction (3+0)**
Construction equipment and methods, construction management and accounting, construction estimates and costs. (Prerequisites: E.M. 450 or equivalent. Offered alternate years. Next offered 1975.)

**C.E. 621 3 Credits As demand warrants**
**Advanced Foundation Engineering (2+3)**
Correlation principles in the analysis and design of spread footings, mats, pile foundations, and retaining walls. Specialty correlation to the class of structural design.

**C.E. 631 3 Credits Fall**
**Advanced Structural Analysis (3+0)**
Continuation of C.E. 431. Continuity in structure. Elastic and plastic theories. Arches and shells. Tall frames. (Prerequisite: C.E. 431. Offered alternate years. Next offered 1974.)

**C.E. 632 3 Credits Spring**
**Advanced Structural Design (2+3)**
Design of complex structures and frames. Live, dead,

and earthquake loadings. Structural joints, columns, connectors, ties, and struts. Application of modern materials and techniques to design. (Prerequisite: C.E. 631. Offered alternate years. Next offered 1975.)

**C.E. 644 3 Credits As demand warrants**
**Hydraulic Engineering (2+3)**
Advnced analysis and design of hydraulic engineering devices, structures and machines. Special emphasis on hydraulic systems and control. (Prerequisite: E.S. 341 or equivalent.)

**C.E. 649 3 Credits As demand warrants**
**City and Regional Planning (3+0)**
Elements of city and regional planning for engineers. Demography, land use, physical planning techniques.

**C.E. 661 3 Credits As demand warrants**
**Advanced Hydrology (3+0)**
The fundamentals of precipitation — runoff relationships, hydrograph analysis, general system analysis, statistical analysis. Emphasis given to dynamic gic processes in cold regions. (Prerequisite: Permission of the instructor.)

**C.E. 662 3 Credits Spring**
**Surface Water Dynamics (3+0)**
Principles of open channel flow; ice covered flow, unsteady flow, streamflow as a sediment and pollution transport agent. (Prerequisite: E.S. 341.)

**C.E. 663 3 Credits Fall**
**Ground Water Dynamics (3+0)**
Foundamentals of geohydrology, hydraulics of flow through porous media, well hydraulics, and ground water pollution, ground water resources development. (Prerequisite: E.S. 341.)

**C.E. 670 3 Credits As demand warrants**
**Waves and Tides (2+1)**
**(Same as OCE 670)**
Generation and propagation of waves at sea, theory of waves, wave spectra and forecasting, observation and recording of ocean waves, tsunamis, tides, internal waves.

**C.E. 674 3 Credits As demand warrants**
**Environmental Hydrodynamics (2+1)**
**(Same as OCE 674 and Phys. 674)**
Mechanics of fluids on a rotating earth. Navier Stoke's equations, boundary layer phenomena, turbulent flow, and applications of hydrodynamics to motion of stratified fluids such as the atmosphere and ocean.

**C.E. 676 3 Credits As demand warrants**
**Coastal Engineering (2+1)**
**(Same as OCE 676)**
Review of deep and shallow water waves, littoral drift, coastal structures, pollution problems, harbor seiches. (Prerequisite: C.E. 670.)

**C.E. 692 1 Credit Fall-Spring**
**Graduate Seminar (1+0)**
Reports and papers on engineering topics. Practice in public speaking. (Prerequisite: permission of the instructor.)

**C.E. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**C.E. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**C.E. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**C.E. 699 Credits Arr. Fall-Spring**
**Thesis**
Individual study or research for students of special aptitude.

## COMPUTER INFORMATION SYSTEMS

**CIS 101 3 Credits Fall**
**Introduction to Data Processing and Fortran (3+0)**
A beginning course covering topics in machine organization, problem formulation, Fortran, programming, information flow, management, and applications of automatic data processing systems.

**CIS 103 3 Credits Fall**
**Techniques of Organization (3+0)**
Programming sequential and random access devices. Methods of organizing, sorting, merging files on cards, tapes, disks, and drums.

**CIS 104 3 Credits Spring**
**Operations Management (3+0)**
Methods of accounting for, organizing, and supervising operation of computing equipment. Personnel relations and company organization.

**CIS 201 3 Credits Spring**
**COBOL (2+2)**
Training and practice in writing problems in the COBOL language. Multiple file processing, editing, and reporting generating routines. (Prerequisite: B.A. 371.)

**CIS 202 3 Credits Fall**
**Principles of Programming with Business Applications (3+0)**
Commonly automated areas in businesses are examined.

Selected problems are programmed in COBOL, Payroll, Inventory Control, Accounts Renewable, General Ledger. (Prerequisites: Acc. 102, B.A. 371.)

**CIS 209 3 Credits Fall**
**Introduction to Operating Systems (3+0)**
Techniques in multi - programming, queueing, scheduling, and handling interrupts from perpheral devices.

**CIS 210 4 Credits Spring**
**Systems Design and Analysis (3+3)**
Concepts and techniques of designing information systems. Topics include systems theory; data collection classification, transmission, and display, data base organization; sequential and random techniques, online systems; and computer software related to system design.

**CIS 220 3 Credits Spring**
**Basic Programming Languages (3+0)**
Programming in selected computer languages including ASSEMBLER, RPG, and machine language. (Prerequisite: CIS 101.)

## CONSTRUCTION TECHNOLOGY

**C.T. 101 3 Credits Fall**
**Construction Drafting (Basic) (1+8)**
Drafting techniques, including orthographic projection, pictorial drawing, sketching and lettering. Development of basic drafting skills, with drafting room equipment.

**C.T. 102 2 Credits Spring**
**Construction Drafting (Basic) (0+6)**
Continuation of C.T. 101. Descriptive geometry, solution of three dimensional problems. Computer aided drafting. Organization of drawings. (Prerequisite: C.T. 101)

**C.T. 111 3 Credits Fall**
**Basic Surveying Skills (0+15) (half semester)**
Introduction to the tools and instruments of the surveyor. Instruction in the use, care, and maintenance of equipment. (Prerequisite: concurrent enrollment in C.T. 121)

**C. T. 112 3 Credits Fall**
**Surveying Computations (5+10) (Half Semester)**
Basic calculations and measurements of the surveyor. Computations for angles, distances, corrections and errors. (Prerequisite: Enrollment in C.T. 121.)

**C.T. 113 3 Credits Spring**
**Earthwork (5+10) (half semester)**
Measurement and calculation of earthwork quantities. Earthmoving methods and equipment. Optimization of site and equipment usage. (Prerequisites: C.T. 111 and C.T. 112)

**C.T. 114 3 Credits Spring**
**Basic Construction Surveys (0+15) (half semester)**
Review of standard field practices, survey party organization, and data recording methods. Study of field books, notekeeping, and problems involving computations in the field. (Prerequisites: C.T. 111 and C.T. 112)

**C.T. 121 3 Credits Fall**
**Surveying Mathematics (3+0)**
Review of high school algebra and geometry. Applied trigonometry, with emphasis on right triangle problems. Use of slide rule and calculations. (Prerequisite: High school algebra.)

**C.T. 131 2 Credits Spring**
**Introduction to Computer Programming (1+3)**
Basic computer programming using the FORTRAN language and stressing scientific and technical applications. (Prerequisite: C.T. 121 or equivalent.)

**C.T. 201 2 Credits Fall**
**Construction Drafting (Structural) (0+6)**
Detailing standards and practice for steel, concrete and timber structures. Preparation of shop and erection drawings from engineering plans. Lay out of formwork. Quantity take-offs. (Prerequisites: C.T. 102 or equivalent.)

**C.T. 202 2 Credits Spring**
**Construction Drafting (Architectural & Mech) (0+6)**
Introduction to architectural and mechanical aspects of building construction. Architectural details. HVAL systems. Piping and ductwork. Quantity take-off. (Prerequisite: C.T. 201.)

**C.T. 211 2 Credits Fall**
**Topographic and Control Surveys (0+6)**
A review of topographic surveying and mapping methods, to include constructing a topographic map from organizing the survey to drafting the finished map. Establishment and use of coordinate systems. Precise control surveys. Property surveys. (Prerequisites: C.T. 113 and C.T. 114)

**C.T. 241 3 Credits Fall**
**Construction Materials Technology (1+6)**
Properties and classification of mineral aggregates, chemistry of cement, properties of asphalt. Mix design and testing of Portland Cement and asphaltic concretes. Introduction to properties of steel and timber.

**C.T. 242 3 Credits Spring**
**Soil Mechanics and Testing (1+6)**
Identification, description and physical properties of soils. ASTM and AASHO soil tests. Subsurface exploration. (Prerequisite: C.T. 241)

**C.T. 251** **2 Credits** **Fall**
**Engineering Economics (1+2)**
Monetary values and the processes of fiscal decision-making. Studies in economic selection among alternatives for selection and replacement of materials and equipment. Depreciation, operation, and maintenance costs of plant and equipment.

**C.T. 252** **2 Credits** **Spring**
**Engineering Estimates (1+3)**
Introduction to construction estimates and bidding. To familiarize the student with the types of estimates and the factors that make up an engineering estimate.

**C.T. 253** **2 Credits** **Spring**
**Contracts & Business Law (1+3)**
Laws of contracts as applied to construction. Correlation of contracts, specifications and plans. Legal aspects of construction. Claims and arbitration. Partnerships and corporations. (Prerequisite: C.T. 251)

**C.T. 261** **3 Credits** **Spring**
**Statics and Strength of Materials (2+2)**
Forces and vectors, static equilibrium, internal resisting forces and properties of materials. Elementary number design. (Prerequisite: E.S. 111.)

**C.T. 271** **2 Credits** **Spring**
**Accounting for Construction (1+3)**
Introduction to accounting principles. General ledger. Job accounting and cost accounting. Special problems of construction accounting. Financial statements. (Prerequisite: C.T. 251 or equivalent)

## ECONOMICS

**Econ. 51** **3 Credits** **Fall**
**Introduction to Economics I (3+0)**
Introduction to the economic problem of scarcity; determination of the levels of national income and employment; the banking system and government policy with respect to expenditures and taxation. The subject matter of this course is similar to that of Economics 121 but is presented in a less theoretically rigorous fashion.

**Econ. 52** **3 Credits** **Spring**
**Introduction to Economics II (3+0)**
Economic problems approached from the level of the individual consumer and the business firm; business profit-maximizing decision-making with respect to prices and output levels; special economic topics such as international trade, wage determination and the role of American labor unions, environmental problems, etc. The subject matter of this course is similar to that of Economics 122 but is presented in a less theoretically rigorous fashion. (Prerequisites: Econ. 51 or permission of instructor.)

**Econ. 101** **3 Credits** **Fall-Spring**
**Introduction to Current Economic Problems (3+0)**
A one semester course designed primarily for the student who plans no further work in economics. The course utilizes a less theoretical approach than is customary in introductory economics courses and focuses on such current problems as unemployment, inflation, economic growth, balance of payments, industrial strikes, etc.

**Econ. 121** **3 Credits** **Fall-Spring**
**Principles of Economics I (3+0)**
Introduction to economics; analysis and theory of national income; money and banking; public finance and taxation; economic systems.

**Econ. 122** **3 Credits** **Fall-Spring**
**Principles of Economics II (3+0)**
Theory of prices and markets; income distribution; contemporary problems of labor, agriculture, public utilities, international economic relations.

**Econ. 221** **3 Credits** **Fall**
**Introduction to Statistics for Economics and Business (3+0)**
Problems in economics and business translated into statistical terms. Organizing of data; identifying of populations and their parameters; sample selection and use of sample data; linear correlations; time series analysis; index numbers. (Prerequisite: Math. 106 or Math. 122 or Math. 161.)

**Econ. 235** **3 Credits** **Spring**
**Resource Economics (3+0)**
Economic analysis as related to the productive use of both renewable and non-renewable resources. Specific topics include: benefit-cost analysis, externalities, valuation of resources, conservation. (Prerequisites: Econ. 122, or permission of instructor.)

**Econ. 236** **3 Credits** **Summer**
**Environmental Economics (3+0)**
Re-examination of economic concepts, goals and philosophies when the environment is explicitly treated as a scarce resource; the costs, benefits and institutional implications of alternative solutions to the problem of environmental decay.

**Econ. 321** **3 Credits** **Fall**
**Intermediate Microeconomics (3+0)**
Analysis of demand and supply under various market forms; cost and theory of production; factor pricing and theory of distribution; survey of welfare economics. (Prerequisites: Econ. 121 & 122.)

**Econ. 324** **3 Credits** **Spring**
**Intermediate Macroeconomics (3+0)**
Concepts and measurement of income; analysis of

aggregate demand and supply and their relation to the level of prices, employment and economic growth. (Prerequisites: Econ. 121 & 122.)

**Econ. 326 3 Credits Spring**
**Statistical Methods (3+0)**
Classical statistics and regression analysis applied to economics and business problems. Specific topics covered include descriptive statistics, elements of probability, sampling, point and interval estimation, hypothesis testing, analysis of variance and regression analysis. (Prerequisites: Econ. 221, Math. 162 or Math. 200.)

**Econ. 332 3 Credits Fall**
**Economic History of the United States (3+0)**
History of the U.S. economy with special emphasis on the process of economic growth. (Offered alternate years. Next offered 1974.)

**Econ. 337 3 Credits Fall**
**Economic Development (3+0)**
Theories of growth and economic development; characteristics of the developing nations; analysis of major problems and policy issues; economic, political and social reforms. (Prerequisites: Econ. 121 and 122, or permission of the instructor.)

**Econ. 350 3 Credits Fall**
**Money and Banking (3+0)**
The liquid wealth system in the United States, to include the commercial banking system, the Federal Reserve System and nonbank financial institutions; the regulation of money and credit and its impact on macroeconomic policy objectives. (Prerequisites: Econ. 121 and 122. Offered in alternate years.)

**Econ. 351 3 Credits Fall**
**Public Finance (3+0)**
Federal, state and local government taxation, spending and debt; their effects on allocation, distribution, stabilization and growth; the role of fiscal policy. (Prerequisites: Econ. 121 and 122. Offered in alternate years. Next offered 1975-76.)

**Econ. 409 3 Credits Fall**
**Industrial Organization and Public Policy (3+0)**
**(Same as B.A. 409)**
The study of the relationship of market structure to the economic conduct and performance of firms and industries; the determinants, measurement and classification of market structure; public policy toward mergers, industrial concentration and aggregate concentration. (Prerequisites: Econ. 121, 122, and 321.)

**Econ. 420 3 Credits Fall**
**Labor Economics (3+0)**
Labor market analysis; employment and unemployment, wage rates, structure and composition of the labor force; economic aspects of unionism, labor legislation, social insurance. (Prerequisites: Econ. 121, 122.)

**Econ. 423 3 Credits Spring**
**Comparative Economic Systems (3+0)**
Contrasts structure, institutions, and dynamics of selected private enterprise, collectivist, and underdeveloped economies. (Prerequisites: Econ. 121, 122.)

**Econ. 424 3 Credits Spring**
**Managerial Economics (3+0)**
Interpretation of economic data and applications of economic theory in business firms. Bridging the gap between theory and practice through empirical studies, cases and decision problems. Particular emphasis upon decision-making based heavily upon analysis of data developed from research. (Prerequisite: Econ. 221 & 321.)

**Econ. 425 3 Credits Fall**
**History of Economic Thought (3+0)**
Economic thought from the physiocrats to the present, classical and neoclassical theory, exponents and critics; contemporary development in economic theory. (Prerequisites: Econ. 121, 122 and three credits of upper division courses in economics or other social sciences. Offered alternate years. Next offered 1975-76.)

**Econ. 435 3 Credits Fall**
**Economics of Resource (3+0)**
Concepts of resources; economic theory applied to resource utilization and management; resources and economic development; theories and problems of conservation; use of Alaska examples. (Prerequisites: Econ. 121 and 122.)

**Econ. 463 3 Credits Spring**
**International Economics (3+0)**
Pure theory of international trade; comparative cost, terms of trade, and factor movements. International disequilibrium; blaance of payments and its impacts on national economy, capital movement, economic development through international trade. (Prerequisites: Econ. 121 and 122. Offered in alternate years. Next in 1975-76.)

**Econ. 471 3 Credits As demand warrants**
**Seminar in Economic Theory (3+0)**
Content will vary but will deal with advanced topics in economic theory. (Prerequisite: Permission of instructor.)

**Econ. 472 3 Credits Spring**
**Seminar in Contemporary Economic Problems (3+0)**
A study of current economic and business problems utilizing the knowledge and analytical techniques

obtained in prerequisite courses. (Prerequisites: Econ. 221, 321, and 324.)

**Econ. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Econ. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Econ. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Econ. 498 Credits Arr. Fall-Spring**
**Research**
Readings and research on individually assigned topics; formal paper required on assigned topic.

**Econ. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Econ. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Econ. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Econ. 698 Credits Arr. Fall-Spring**
**Economic Research**
Methods of economic research used in analyzing specific, assigned topics. Discussion of problems encountered, results obtained. Report and formal paper required. (Prerequisites: graduate standing and permission of the instructor.)

## EDUCATION

**Ed. 201 3 Credits Fall-Spring**
**Orientation to Education (1+6)**
Designed to acquaint the prospective teacher with the nature of teaching, including the scholastic, professional, and personality requirements for effective teaching. Involves laboratory time in the public schools as teacher's aide. Open to all students. Required for students majoring in education.

**Ed. 301 3 Credits As demand warrants**
**Social Studies for Elementary Teachers (3+0)**
Methods and materials adaptable to modern curriculum in elementary social studies. (Prerequisites: Ed. 313 and prerequisites thereto.)

**Ed. 302 3 Credits As demand warrants**
**Language Arts for Elementary Teachers (3+0)**
Definition; role of language in children's learning; specific language skills to be taught in grades one through eight; methods and materials for effective teaching; organization for instruction; all aspects of the language arts, except reading. (Prerequisites: Ed. 313 and prerequisites thereto.)

**Ed. 303 3 Credits Fall**
**Language Development (3+0)**
Principles, procedures and materials for enhancing the language development of young children. (Prerequisite: Psy. 244.)

**Ed. 304 3 Credits Spring**
**Literature for Children (3+0)**
Criteria for evaluating children's books and application of criteria to books selected by student; history of children's literature; study of outstanding authors, illustrators and content of specific categories of literature; book selection aids and effective use of literature to promote learning. (Prerequisite: Psy. 245 or permission of the instructor.)

**Ed. 306 3 Credits As demand warrants**
**Teaching of Science in Elementary Schools (3+0)**
Modern concepts, methods and materials of teaching science. (Prerequisites: Ed. 313 and prerequisites thereto.)

**Ed. 307 3 Credits As demand warrants**
**Teaching of Arithmetic (3+0)**
Present day concepts, methods and materials. (Prerequisites: Math. 105 or its equivalent, Ed. 313 and prerequisites thereto. In-service teachers may substitute Math. 345 for the mathematics prerequisites.)

**Ed. 308 3 Credits Spring**
**Physical Education for the Elementary School (2+3)**
**(Same as P.E. 308)**
Philosophy, source materials, games, rhythmics, group activities and program planning; participation required to gain skills and techniques of teaching activities for elementary grade children. (Prerequisites: Ed. 313 and prerequisites thereto.)

**Ed. 309 3 Credits Fall-Spring**
**Elementary School Music Methods (3+0)**
**(Same as Mus. 309)**
Principles, procedures, and materials for teaching music to children at the elementary level. (Prerequisites: Ed. 313 and prerequisites thereto.)

**Ed. 311 3 Credits Spring**
**Audio-Visual Methods and Materials (3+2)**
Selection and use of audio-visual materials in teaching and learning at all levels of education. (Prerequisites: Ed. 313 and prerequisites thereto.)

**Ed. 313 3 Credits Fall-Spring**
**Educational Psychology (3+0)**
Study of psychological principles and experience in applying them to classroom teaching and learning in public school classrooms. Must be taken in conjunction with Ed. 314. (Prerequisites: Psy. 101 and 245 or 246.)

**Ed. 314 1 Credit Fall-Spring**
**Practicum in Tutoring: Behavior Modifications (0+1)**
This course offers college students the opportunity to apply — in practical situations — the techniques of behavior modification / contingency management. Must be taken in conjunction with Ed. 313. (Prerequisites: Psy. 101 and Psy. 245 or 246.)

**Ed. 315 3 Credits Fall-Spring**
**Elementary Methods I (2+3)**
General methods and management procedures in the elementary school classroom. (Prerequisites: Ed. 313 and prerequisites thereto.)

**Ed. 316 3 Credits Fall-Spring**
**Elementary Methods II (2+3)**
Concepts, methods and materials of teaching social studies and all aspects of the language arts, except reading. Includes field experience in the public schools. (Prerequisites: Ed. 313 and prerequisites thereto.)

**Ed. 317 3 Credits Fall-Spring**
**Elementary Methods III (2+3)**
Modern concepts, process skills, methods and materials of teaching mathematics and science with a field-based emphasis. (Prerequisites: Math. 105 or equivalent, and Ed. 313 and prerequisites thereto.)

**Ed. 331 1 Credit Fall**
**Evaluation Procedures for Early Childhood Education (1+0)**
Techniques of evaluation appropriate to early childhood education.

**Ed. 332 3 Credits Fall-Spring**
**Tests and Measurements (3+0)**
Theory and practice of educational evaluation; emphasis on testing aspects most applicable for classroom teachers; construction of teacher-made tests; interpretation of teacher-made and standardized instruments emphasized. Not open to students having credit in Psy. 373. (Prerequisites: Ed. 313 and prerequisites thereto.)

**Ed. 345 3 Credits Spring**
**Sociology of Education (3+0)**
**(Same as Soc. 345)**
Impact of culture on schools. Examination of contemporary social trends and relationships among church, school, government, and family. (Prerequisite: Soc. 101.)

**Ed. 348 3 Credits Spring**
**History of Education (3+0)**
Development of education in Western civilization and its implications for American education. (Prerequisites: History 101, 102 or History 131, 132.)

**Ed. 351 1 Credit Summer**
**Workshop on Alaska**
A workshop consisting of lectures and demonstrations by authorities in anthropology, biology, education, geography, mining, geology, history, literature, art, wildlife, and various other teaching fields.

**Ed. 384 3 Credits Fall**
**The Exceptional Child (3+0)**
Characteristics, identification, diagnosis, and remediation procedures for use with exceptional children. (Prerequisites: Ed. 313 and prerequisites thereto and junior standing.)

**Ed. 402 3 Credits Fall-Spring**
**Methods of Teaching (3+0)**
Principles and methods of teaching management, routine, daily programs, etc. (Prerequisites: Ed. 332 and prerequisites thereto. Must be taken concurrently with Student Teaching, Ed. 452, at the secondary level.)

**Ed. 404 3 Credits As demand warrants**
**Methods of Teaching Foreign Languages (3+0)**
Discussion of the particular problems related to the teaching of foreign languages in the secondary schools, evaluation of teaching aids, audio-visual equipment and the language laboratory, and methods such as "grammar - translation," "direct," "audio-lingual;" recent research on the subject. (Prerequisites: 100 semester hours, Ed. 332 and prerequisites thereto.)

**Ed. 405 3 Credits As demand warrants**
**Methods of Teaching Music (3+0)**
**(Same as Mus. 405)**
Methods and problems of teaching music in junior and senior high schools, with emphasis on the general music program. (Prerequisites: 100 semester hours, Ed. 332 and prerequisites thereto, and Mus. 232, or permission of the instructor.)

**Ed. 406 3 Credits As demand warrants**
**Methods of Teaching Physical Education (3+0) (Same as P.E. 406)**
Selection of materials and presentation methods for secondary school physical education. (Prerequisites: 100 semester hours, Ed. 332 and prerequisites thereto.)

**Ed. 407 3 Credits As demand warrants**
**Methods of Teaching Home Economics (3+0)**
Problems and methods in selecting and organizing materials for instruction; comparison and evaluation of methods, laboratory techniques, supplies, equipment; economy of time and materials. (Admission by arrangement. Prerequisites: 100 semester hours, Ed. 332 and prerequisites thereto.)

**Ed. 408 3 Credits As demand warrants**
**Methods of Teaching Business Education (3+0)**
**(Same as O.A. 408)**
Organization and content of high school business education courses; equipping a business education department, including selection, care, and maintenance; methods in teaching bookkeeping, typewriting, shorthand, and transcription. (Admission by arrangement. Prerequisites: 100 semester hours, Ed. 332 and prerequisites thereto.)

**Ed. 409 3 Credits Fall**
**The Teaching of Reading (3+0)**
Importance and nature of reading. Specific steps involved in the teaching of reading, word analysis, comprehension, interpretation, reading rate; new developments in reading instruction emphasizing appropriate materials. (Prerequisites: Ed. 313 and prerequisites thereto.)

**Ed. 410 3 Credits Spring**
**Reading and Young Children (3+0)**
The consideration of skills prerequisite -- effective reading development, the simple beginnings of reading, skills and competencies expected of the beginning reader and various approaches to reading currently being used. (Prerequisites: Psy. 244 or Psy. 245 and Ed. 313 and prerequisites thereto.)

**Ed. 421 3 Credits Spring**
**Secondary Education (3+0)**
Development of a working concept of secondary education in the U.S., its history, objectives, curriculum, organization, practices, and consideration of current issues. (Prerequisites: Ed. 313 and prerequisites thereto.)

**Ed. 422 3 Credits Fall**
**Philosophy of Education (3+0)**
Basic philosophic concepts and their historical development; philosophy applied to education and related issues and problems; examinations of contributions of outstanding educators. (Prerequisite: Phil. 201 or permission of instructor.)

**Ed. 426 3 Credits Fall-Spring**
**Principles and Practices of Guidance (3+0)**
Introduction to the philosophies; organization, patterns, tools, and techniques that aid teachers and guidance personnel in preparing students for responsible decision-making in modern society. (Prerequisites: Ed. 332 and prerequisites thereto.)

**Ed. 443 3 Credits As demand warrants**
**Foundations of Vocational Education (3+0)**
A study of the social and philosophical roots of vocational education in America, and public policy as a response to the need for an educated labor force. The relationship of vocational, technical, and special education to general education and the responsibility of public education in a technological society. (Prerequisites: Teaching credential consistent with program design.)

**Ed. 446 3 Credits As demand warrants**
**Public School Organization, Control, and Support (3+0)**
Fundamentals of public school organization, control, and support. Relation of federal, state, and local agencies. Problems incident to public school organization, control, and support in Alaska. (Prerequisite: senior standing in education. Not open to students who took Ed. 442, 542 before they were abolished.)

**Ed. 452 9 Credits Fall-Spring**
**Student Teaching (0+18)**
Supervised teaching in elementary or secondary schools of Fairbanks or in a school approved by the Department of Education. The department may limit registration, determine assignments, prescribe the number of teaching hours required, and cancel the registration of students doing unsatisfactory work. (Prerequisite: see page 104 for requirements for admission to student teaching. May be taken concurrently with Ed. 402.)

**Ed. 480 3 Credits Spring**
**Education of Culturally Different Youth (3+0)**
Interdisciplinary study of problems encountered by teachers in educating culturally atypical pupils. Consideration of psychological and social factors inherent in the educational process. Specific attention given to curricular improvement and teaching strategies appropriate for culturally different students. (Prerequisites: Ed. 313 and prerequisites thereto and junior standing.)

**Ed. 492 Credits Arr. As demand warrants**
**Seminar**
Current topics in education. (Prerequisite: permission of the head of the department.)

**Ed. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Ed. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Ed. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Ed. 601 3 Credits Fall-Spring**
**Graduate Seminar (3+0)**
Expectations, concerns, and questions regarding elementary and secondary classroom teaching today. Selected major trends, problems, and issues in elementary and secondary education and the profession of elementary and secondary teaching. (Prerequisite: Graduate standing or permission of the instructor.)

**Ed. 604 3 Credits As demand warrants**
**Diagnosis and Correction of Reading Deficiencies (3+0)**
Nature of the reading process; emphasis on psychology involved in discerning reading difficulties; testing programs to ascertain specific disabilities in readiness, vocabulary, word-attack, comprehension, speed and accuracy; specific suggestions for their correction; newer approaches to teaching reading. (Prerequisites: Ed. 409 and experience in the teaching of reading.)

**Ed. 605 2 Credits As demand warrants**
**Reading Lab (0+6)**
Working with a child who has been identified as having reading problems using testing and remedial techniques appropriate to his need. (Prerequisites: Ed. 409 and Ed. 604. May be taken concurrently with Ed. 604.)

**Ed. 607 3 Credits As demand warrants**
**Reading in Secondary Schools (3+0)**
Organizing and conducting a comprehensive reading program in the secondary school. Specific skills involved in the teaching of reading, emphasizing new developments in instruction and materials. Open to all secondary teachers.

**Ed. 608 3 Credits As demand warrants**
**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. (Prerequisite: graduate standing in education and elementary teaching experience.)

**Ed. 620 3 Credits As demand warrants**
**Curriculum Development (3+0)**
Basic definition of curriculum. Present need for curriculum improvement. Criteria for selection of broad goals. Types of curriculum framework examined. Consideration of the organization of specific learning experiences as part of the curriculum structure. (Prerequisites: Ed. 313 and graduate standing in education.)

**Ed. 621 3 Credits As demand warrants**
**Student Personnel Work in Higher Education (3+0)**
Provide selected student services para-professionals and graduate students in education with information to assist in development of an increased understanding of the role and scope of student personnel work as a supporting force in American higher education. (Prerequisite: Permission of the instructor.)

**Ed. 622 3 Credits As demand warrants**
**Current Issues in Student Personnel Administration (3+0)**
The contemporary problems and issues affecting student personnel workers in higher education. Includes an examination of the changing role of students; student diversity; students' rights, freedoms, and responsibilities; evaluation, research, and accountability; financing; and relationship to central administrative services. (Prerequisite: Ed. 621 and permission of the instructor.)

**Ed. 623 3 Credits As demand warrants**
**Principles of Individual Counseling (3+0)**
**(Same as Psy. 623)**
Counseling techniques and procedures in education, social work and on a limited basis, clinical psychology; their applications by the classroom teacher and guidance specialist in assisting students with adjustment problems within a normal range. (Prerequisites: Ed. 426, Psy. 338 or 406 and permission of the instructor.)

**Ed. 624 3 Credits As demand warrants**
**Group Counseling (3+0)**
**(Same as Psy. 624)**
Kinds and types of groups with emphasis on methods, problems and needed skills in working with groups in a counseling situation. (Prerequisites: Ed. 426, 623.)

**Ed. 625 3 Credits As demand warrants**
**Higher Education: Basic Understandings (3+0)**
Historical and philosophical foundations of higher education, both in America and abroad. Examination of curriculum development, instruction, administration and interinstitutional cooperation, with emphasis on trends and innovations in higher education. (Prerequisite: Graduate standing and permission of the instructor.)

**Ed. 626 3 Credits As demand warrants**
**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: Ed. 621 and permission of the instructor.)

**Ed. 627 3 Credits Fall and Spring**
**Education Research (3+0)**
Techniques of education research; selection of topics and problems, data gathering, interpretation and preparation of reports. (Prerequisite: graduate standing in education.)

**Ed. 628 3 Credits As demand warrants**
**Analysis of the Individual (3+0)**
**(Same as Psy. 628)**
Means of acquiring data pertinent to the individual. Interpreting data and formulating case reports conducive to greater understanding. (Prerequisite: Ed. 426.)

**Ed. 629 3 Credits As demand warrants**
**Individual Tests of Intelligence (3+0)**
**(Same as Psy. 629)**
Individual intelligence tests with emphasis on the Revised Stanford-Binet Intelligence Scale and the Wechsler Intelligence Scales. (Prerequisites: Ed. 332 and permission of the instructor.)

**Ed. 630 3 Credits As demand warrants**
**Laboratory in Individual Tests of Intelligence (0+9)**
**(Same as Psy. 630)**
Provides laboratory experience in administration of the Revised Stanford-Binet Intelligence Scale or the Wechsler Intelligence Scales. (Prerequisites: Ed. 629 and permission of the instructor.)

**Ed. 631 3 Credits As demand warrants**
**Advanced Educational Psychology: Developmental (3+0)**
Stresses understanding of human emotional, mental, physical, and social development. Emphasis on individual differences. Assumes one previous course in human development, educational psychology, and teaching experience. (Prerequisite: graduate standing.)

**Ed. 632 3 Credits As demand warrants**
**Occupational Information (3+0)**
**(Same as Psy. 632)**
Principles and practices of vocational guidance. Explains process of choosing a vocation, theories of vocational choice, sources and dissemination of occupational information. (Prerequisites: graduate standing, Ed. 426 and permission of the instructor.)

**Ed. 633 2 Credits As demand warrants**
**Organization, Administration, and Supervision of Guidance (2+0)**
For administrators, guidance personnel and others interested in developing or evaluating a guidance program; selection procedures and supervision of guidance personnel are considered. (Prerequisite: Ed. 426.)

**Ed. 634 1 to 3 Credits Arr. Fall-Spring**
**Counseling Practicum**
**(Same as Psy. 634)**
Provides supervised field experience, including preparatory activities in an educational and agency setting. (Prerequisite: Approval of instructor. May be repeated for a maximum of six credits.)

**Ed. 636 2 Credits As demand warrants**
**Advanced Public School Administration: Cases and Concepts (2+0)**
Case study approach to public school administration; identification and analysis of basic issues and problems; identification of pertinent data and possible solutions. (Prerequisite: first course in public school administration.)

**Ed. 637 3 Credits As demand warrants**
**Public School Administration (3+0)**
Responsibility pertaining to the organization of a school and the direction of personnel. Functions of instructional leadership. Public school administration as a career. Problems incident to public school administration in Alaska. (Prerequisites: Ed. 446 and graduate standing in education.)

**Ed. 638 3 Credits As demand warrants**
**Supervision and Improvement of Instruction (3+0)**
Development, purpose, organization of supervisory programs; special attention to current in-service education programs. (Prerequisite: graduate standing in education.)

**Ed. 639 3 Credits As demand warrants**
**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.)

**Ed. 641 3 Credits As demand warrants**
**School Law (3+0)**
Rights and responsibilities of teachers and pupils; rulings of the Attorney General; decisions of the courts, regulations of the State Board of Education. (Prerequisite: graduate standing in education.)

**Ed. 642 3 Credits As demand warrants**
**Career Education in Public Schools (3+0)**
An introduction and examination of career education concepts, teacher strategies and career guidance structure in grades K-12. (Prerequisites: Upper division graduate student consistent with program design.)

**Ed. 643** **3 Credits** **As demand warrants**
**Cooperative Occupational Education in the Curriculum (3+0)**
A study of cooperative work experience programs as an interdependent combination of instruction and employment. The course will focus on key elements of the cooperative work experience plan as a vehicle for applying and testing what has been learned in the classroom. (Prerequisites: Teaching credential consistent with program design.)

**Ed. 644** **3 Credits** **As demand warrants**
**Organization and Administration of Vocational Education (3+0)**
This course will examine the principles and problems of organizations and administrative practices as related to the structure and operation of state and local programs of vocational education. (Prerequisites: Teaching credential consistent with program design.)

**Ed. 660** **6 Credits** **As demand warrants**
**Internship**
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 and admission to candidacy for the Ed.S. degree.)

**Ed. 692** **Credits Arr.** **As demand warrants**
**Educational Seminar**
Current topics in education. Maximum credit allowed toward advanced degrees: four credits. (Admission by arrangement.)

**Ed. 693** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Ed. 694** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Ed. 697** **Credits Arr.** **As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Ed. 698** **Credits Arr.** **Fall-Spring**
**Research Education**
Independent project in lieu of thesis. (Admission by arrangement. Prerequisite: Ed. 627.)

**Ed. 699** **Credits Arr.** **Fall-Spring**
**Thesis**
(Offered as demand warrants. Prerequisite: Ed. 627.)

## ELECTRICAL ENGINEERING

**E.E. 102** **3 Credits** **Fall**
**Introduction to Electrical Engineering (3+0)**
Basic modern devices, concepts, technical skills, and instruments of electrical engineering.

**E.E. 203** **4 Credits** **Fall**
**E.E. 204** **4 Credits** **Spring**
**Electrical Engineering Fundamentals (3+3)**
Analysis of alternating - current circuits using complex notation and phasor diagrams; resonance; transformers; Fourier analysis; the complex frequency plane; three-phase circuits. (Prerequisite: Math. 200.)

**E.E. 323** **1 Credit** **Fall**
**E.E. 324** **1 Credit** **Spring**
**Electrical Engineering Lab I (0+3)**
Laboratory problems emphasizing measurement techniques, laboratory procedures, and operation principles of basic instruments. Laboratory exercises basically in circuits, electronics, and control. Semester design problems. (Corequisites: E.E. 333, 334 or permission of the instructor.)

**E.E. 332** **3 Credits** **Spring**
**Electromagnetic Waves and Antennas (3+0)**
Use of Maxwell's equations in the analysis of waveguides, cavity resonators, and transmission lines; retarded potentials; antennas for radio and microwave frequencies. (Prerequisites: Math. 302, Physics 331.)

**E.E. 333** **3 Credits** **Fall**
**Physical Electronics (3+0)**
Basic properties of semiconductors; p-n junctions and transistors. (Prerequisite: E.E. 204.)

**E.E. 334** **3 Credits** **Spring**
**Electronic Circuit Design (3+0)**
Analysis of the common circuits used in computation, control, and communications; stability considerations; worst case design of functional units. (Prerequisite: E.E. 333.)

**E.E. 353** **3 Credits** **Fall**
**Circuit Theory I (3+0)**
Transient analysis by Laplace transform, state variable, and Fourier methods; filter networks, computer aided analysis. (Prerequisite: E.E. 204.)

**E.E. 354** **3 Credits** **Spring**
**Circuit Theory II (3+0)**
State variable methods, advanced network analysis and synthesis, filter networks. (Prerequisite: E.E. 353.)

**E.E. 403** **4 Credits** **Fall**
**Electrical Power Engineering (3+3)**
Characteristics and applications of electric motors,

generators and transformers; multiphase circuit applications, transients, fault currents, and system stability; power systems. (Prerequisites: E.E. 204.)

**E.E. 404 4 Credits Spring**
**Electrical Power Engineering II (3+3)**
Topics in generation, power system operation and management, and distribution which include selection of energy source, plant layout and construction, rate structures, customer relations, and power regulation and relaying. (Prerequisite: E.E. 403.)

**E.E. 431 1 Credit Fall**
**High Frequency Lab I (0+3)**

**E.E. 432 1 Credit Spring**
**High Frequency Lab II (0+3)**
Laboratory experiments in transmission lines, impedances, bridges, scattering parameters, hybrids, waveguides, cavities, periodic circuits, waveguide obstacles, isolators, multi-port junctions, antennas, lasers, bulk-effect microwave generators. (Co-requisites: Phys. 331 or equivalent.)

**E.E. 442 4 Credits Fall**
**Digital Computers (4+0)**
Design functioning of digital systems; computer organization, computer arithmetic, combinational and sequential circuits, methods of control, electronic circuitry. (Prerequisite: junior standing in electrical engineering, mathematics or physics, or permission of the instructor. Offered in alternate years. Next offered 1974-75.)

**E.E. 462 4 Credits Fall**
**Communication Systems (3+3)**
Theory and practice of communications systems; introduction to information theory; system design and laboratory experience in analogs and digital communication. (Prerequisite: credit or registration in E.E. 353.)

**E.E. 471 4 Credits Fall**
**Fundamentals of Automatic Control I (4+0)**
Linear system representation by transfer functions and state variables. The concept of feedback. Time and frequency response of linear systems. Identification. Controllability and observability. Stability by Routh-Hurwitz criterion and frequency plane methods. Specifications of higher order linear systems. System design and compensation. (Prerequisites: E.E. 353 or permission of the instructor.)

**E.E. 472 4 Credits Spring**
**Fundamentals of Automatic Control II (4+0)**
Discrete state variable methods. The Z-transform and its application to sampled-data control systems. Stability and response. Compensation. Control by digital computer. Elements of stochastic control systems, estimation and filtering. Elements of non-linear control, including stability by Liapunov's method. Elements of optimal control, including Pontryagin's principle. (Prerequisites: E.E. 471 or permission of the instructor.)

**E.E. 474 3 Credits Fall**
**Instrumentation and Measurement (3+0)**
Instrumentation theory and concepts; devices, transducers; data sensing, transmission, recording, display, instrumentation systems; remote sensing; hostile environmental conditions. (Prerequisites: E.S. 207, E.S. 308, or permission of the instructor.)

**E.E. 481 3 Credits Fall**
**Electronics and Instrumentation for Scientists and Engineers I (2+3)**
Theory and design of solid state electronic circuitry for practicing engineers and scientists in the physical and life sciences. Diodes, transistors, field effect transistors, integrated circuits and other solid state devices. Analysis of modern electronic systems. (Prerequisites: 1 year of college physics; mathematics through calculus.)

**E.E. 482 3 Credits Spring**
**Electronics and Instrumentation for Scientists and Engineers II (2+3)**
Instrumentation theory and concepts; transducers; data transmission, recording and reducing. Digital electronics. Electrical measurement of physical variables and error analysis. (Prerequisite: E.E. 481 or equivalent.)

**E.E. 492 1 Credit Fall-Spring**
**Seminar (1+0)**
Current topics. Senior students will have an opportunity to present papers. May be taken more than once for credit.

**E.E. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**E.E. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**E.E. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**E.E. 603 3credits Fall**
**Advanced Electric Power Engineering (3+0)**
Selected advanced topics in electric power generation, transmission, utilization, optimization, stability, and economics. (Prerequisite: E.E. 403 and E.E. 404 or equivalent, or permission of instructor.)

**E.E. 604 3 Credits Spring**
**Nuclear Power Generation (3+0)**
Fundamentals of nuclear reactors, nuclear electric generators, performance characteristics, control, instrumentation, and economics. (Prerequisite: E.E. 403 and 404 or equivalent, or permission of the instructor. Offered as demand warrants.)

**E.E. 607 3 Credits Fall**
**E.E. 608 3 Credits Spring**
**Communications Systems Engineering (3+0)**
A description of the communication network of North America; technical details of design and operation of telephone systems on the local level; switching system principles and alternatives; design of transmission systems of all types; system performance considerations; technical and economic analyses for system designs. (Prerequisite: B.S. degree in Electrical Engineering or equivalent experience; or permission of instructor.)

**E.E. 631 3 Credits Fall**
**Quantum Electronics (3+0)**
Applied quantum mechanics; stimulated emission; conditions for oscillation and amplification. Applications to microwave and optical gas and solid state masers. Theory and properties of molecular and semiconductor masers, nonlinear and multiple-photon processes, and optical resonators. (Co-requisite: Phys. 651 or permission of instructor.)

**E.E. 632 3 Credits Spring**
**High Frequency Devices (3+0)**
Principles of operation of microwave tubes, microwave semiconductor devices, parametric amplifiers, nonlinear elements, ferromagnetics. (Prerequisite: E.E. 332.)

**E.E. 635 3 Credits Fall**
**Advanced Electronic Circuit Design (3+0)**
Low noise level design; networks for extraction of signals from noise; environmental design; signal conditioning networks. (Prerequisite: E.E. 334 or permission of the instructor.)

**E.E. 651 4 Credits Fall**
**Stochastic Control Systems (4+0)**
Performance measure and minimization techniques; continuous and discrete random processes in control systems. Optimal design of systems having stochastic signals and noise. Application of the Wiener-Hopf method to control systems design. Kalman-Bucy filtering methods in the continuous and discrete domain. (Prerequisites: Math. 371, E.E. 472 or permission.)

**E.E. 652 4 Credits Spring**
**Optimal Control (4+0)**
Calculus of variations applied to optimal control. The Pontryagin maximum principle, Bellman's principle of optimality. Dynamic programming and the matrix riccati equation. Optimization under constraints. Minimum-time control. The optimal regulator problem. Elements of optimum-switched systems. (Prerequisites: E.E. 472 or permission.)

**E.E. 662 3 Credits Spring**
**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, channel models. (Prerequisite: Math. 302.)

**E.E. 672 3 Credits Fall**
**Underwater Acoustics (3+0)**
**(Same as OCE 672)**
Nature of sound, units and standards, sound-related characteristics of sea water, transmission and transmission losses, effect and discontinuities, reverberation, measurement techniques.

**E.E. 674 3 Credits Spring**
**Instrumentation Systems (3+0)**
Design of complete engineering and scientific instrumentation systems; test methodology; cost, reliability, and accuracy considerations; environmental hazards; space applications. (Prerequisite: E.E. 474.)

**E.E. 676 1 Credit Spring**
**Instrumentation Lab II (0+3)**
Building and testing systems designed in E.E. 674. (Fee $20) (Corequisite: E.E. 674.)

**E.E. 692 Credits Arr. Fall-Spring**
**Seminar**
Current topics at an advanced level. Presentation of student papers.

**E.E. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics approved to be offered only once during an academic year.

**E.E. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**E.E. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**E.E. 699 Credits Arr. Fall-Spring**
**Thesis**
Individual study and research.

## ELECTRONICS TECHNOLOGY (Industrial Technology Program)

**E.T. 151 4 Credits Fall-Spring**
**DC Circuits (5+12)**
The first course in electricity for electronics technicians. Basic physics, electrical terms and units, meters and their use, resistance, Ohms' law, simile circuits, magnetic fundamentals, batteries, Kirchoffs' laws, DC circuit analysis, inductance, and capacitance.

**E.T. 152 4 Credits Fall-Spring**
**AC Circuits (5+12)**
Principles of alternating current, vectors, phase relationships, inductive and capacitative reactance and impedance, AC circuit analysis, series and parallel resonant circuits, transformers, and Thevenin's equivalent circuit.

**E.T. 157 3 Credits Fall-Spring**
**Logic Circuits and Boolean Algebra (3+3)**
Lecture and laboratory includes studies in digital gates and circuits, number systems, Karnough maps, binary arithmetic, truth tables and boolean algebra.

**E.T. 159 5 Credits Fall-Spring**
**Mathematics for Electronics (5+3)**
Review of arithmetic. Selected topics in algebra, trigonometry, slide-rule computation, graphs, analytical geometry, waveform analysis, decibel calculations, and applications to electronics. (Prerequisite: high school mathematics.)

**E.T. 165 3 Credits Spring-Summer**
**Semiconductor Devices and Circuits (2+3)**
Basic physics; diodes including special types. The transistor and basic transistor circuits. The S.C.R. and applications. F.E.T.'s and unijunction transistors. (Prerequisite: E.T. 151 and E.T. 152.)

**E.T. 166 3 Credits Spring-Summer**
**Electronics Practice (0+12)**
Electronic drawings, soldering, electrical connections, and use of hand tools. Layout and assembly of audio-frequency equipment, operation of transmitters and receivers, troubleshooting; practical aspects of electronics.

**E.T. 168 3 Credits Spring-Summer**
**Basic Circuit Theory (2+6)**
Transformer theory. Special purpose vacuum tubes, including high power types and cathode ray. Filter circuits, power supplies, waveshaping circuits. Transmitter and receiver concepts. (Prerequisites: E.T. 151 and E.T. 152.)

**E.T. 184 5 Credits Spring-Summer**
**Digital Computer Theory and Application (3+6)**
Theory, organization, functioning and maintenance of large digital computer systems. (Prerequisites: E.T. 151, E.T. 152 and E.T. 157.)

**E.T. 275 3 Credits Summer-Fall**
**Microwave Electronics (2+3)**
Microwave oscillators, transmitters, duplexers, antennas, amplifiers, mixers, receivers, and multiplexing. (Prerequisites: E.T. 165 and E.T. 168.)

**E.T. 278 4 Credits Summer-Fall**
**Solid State Electronics (2+6)**
Basic solid state theory and application including laboratory work in the following areas: methods of circuit analysis, circuit aspects of field effect transistors, integrated circuits, and silicon controlled rectifiers. (Prerequisites: E.T. 165, 166 and 168.)

**E.T. 281 4 Credits Summer-Fall**
**Telemetry (2+6)**
Telemetry techniques including signal conditioning, frequency division telemetry, data sampling, pulse amplitude modulation, pulse duration modulation, pulse code modulated telemetry, subcarrier discriminators. PAM/PDM decommutation, and real time monitoring. (Prerequisites: E.T. 157, 165, 166 and 168.)

**E.T. 282 3 Credits Summer-Fall**
**Communication Circuits (2+3)**
Propagation of radio waves; antenna and transmission lines studies; basic receivers and receiver circuits; transmitters and transmitter circuits; television receivers and transmitter circuits. (Prerequisites: E.T. 168.)

**E.T. 283 3 Credits Summer-Fall**
**Waveshaping Circuits (2+3)**
Nonsinusoidal waveshapes; waveshaping circuits including differentiated and integrated voltage waveshapes. Oscilloscope analysis of waveshape distortion. Limiters, clampers, and counters. Polyphase power supplies. (Prerequisites: E.T. 168.)

**E.T. 287 4 Credits Fall-Spring**
**Modern Communication Techniques (2+6)**
Preparation for F.C.C. 1st class Radiotelephone license. Application of state of the art components in communications. (Prerequisites: E.T. 275 and E.T. 278 or by permission of the instructor.)

**E.T. 289 5 Credits Fall-Spring**
**Solid State Systems Development (3+6)**
Small system development, fabrication and operation utilizing state of the art solid state components. (Prerequisites: E.T. 166, 278, and 281.)

## ENGINEERING AND SCIENCE MANAGEMENT

**E.S.M. 401 Credits Arr. Fall**
**Construction Cost Estimating and Bid Preparation (3+0)**
Compilation and analysis of the many items that influence and contribute to the cost of projects to be constructed. Preparation of cost proposals and study of bidding procedures.

**E.S.M. 450 3 Credits Spring**
**Economic Analysis and Operations (3+0)**
Fundamentals of engineering economy, project scheduling, estimating, legal principles, professional ethics, and human relations. (Not offered for credit toward the Master of Science in Engineering Management or Science Management. Not offered for credit toward the Master of Science in Engineering Management or Science Management. (Prerequisites: E.S. 201 and senior standing in engineering or permission of instructor.)

**E.S.M. 605 3 Credits Fall**
**Advanced 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. 611 3 Credits Fall**
**Engineering Management (3+0)**
Review of accounting principles; industrial accounting including cost accounting; business organization; business finance; emphasis on use of data in management rather than its generation.

**E.S.M. 612 3 Credits Spring**
**Engineering Management (3+0)**
Development of ability to seek out needed information, analyze it, and make recommendations over a wide range of managerial problems involving fiscal matters; cases involving capital acquisitions, profit maximization, methods improvement, pricing, modification of controls, and other management problems. (Prerequisites: E.M. 605, 611.)

**E.S.M. 613 3 Credits Spring**
**Engineering Management (3+0)**
Human element in management; labor relations, human relations, personnel administration, industrial psychology, employee relations, and labor economics from the viewpoint of needs of a manager.

**E.S.M. 621 3 Credits Spring**
**Operations Research (3+0)**
Mathematical techniques for aiding managerial decision-making. Waiting line theory, inventory models, linear programming, transportation problem, dynamic programming, PERT/CPM, machine scheduling, and simulation. Emphasis on application of techniques to actual management situations.

**E.S.M. 623 3 Credits Fall-Spring**
**Computer Programming for Engineering Managers (3+0)**
A course in basic FORTRAN programming, with applications to engineering management problems. (Not offered for credit toward the Master of Science in Engineering Management or Science Management.)

**E.S.M. 684 3 Credits Spring-Fall**
**Project (3+0)**
Individual study of an actual engineering management problem resulting in a report which includes recommendations for action.

**E.S.M. 692 Credits Arr. Fall-Spring**
**Seminar**

**E.S.M. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**E.S.M. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**E.S.M. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

## ENGINEERING SCIENCE

**E.S. 101 2 Credits Fall**
**Graphics (0+6)**
Correct use of drafting instruments. Lettering, geometric construction, orthographic projection, sketching dimensioning, perspective drawing, simple design project, introduction to computer graphics.

**E.S. 102 2 Credits Spring**
**Graphics (0+6)**
Descriptive geometry, graphic solution of three dimensional problems, design project, graphic solution of vector problems, perspective drawings by computer, graphs, charts and diagrams, graphical calculus. (Prerequisite: E.S. 101 or equivalent.)

**E.S. 111 3 Credits Fall**
**Engineering Science (1+4)**
Engineering problems solving with emphasis on the statics, kinematics, and dynamics of engineering systems. Conservation laws, fluid mechanics, and heat. (Prerequisite: credit or registration in Math. 106)

**E.S. 122 3 Credits Spring**
**Engineering Design (1+6)**
Student engineering companies will design useful new devices and in so doing practice the techniques of creative engineering; study of need, design, and testing; cost and market analysis; scheduling, budgeting, and organization; written and oral presentation. (Prerequisite: E.S. 111 or permission of the instructor.)

**E.S. 201 3 Credits Fall-Spring**
**Computer Techniques (2+3)**
Basic computer programming, primarily in FORTRAN, with considerable applications from all fields of engineering. (Prerequisite: Math. 106 or enrollment in Math. 200.)

**E.S. 208 4 Credits Spring**
**Mechanics (3+3)**
Statics, kinematics, dynamics. Both classical and vector methods are used. Graphical solutions, work and energy, impulse and momentum, virtual work. (Prerequisites: E.S. 111 or Phys. 105 and Math. 201.)

**E.S. 301 3 Credits Spring-Fall**
**Engineering Analysis (3+0)**
Application of mathematical tools to the engineering with emphasis on the mathematical formation of typical engineering problems. Selected topics from all fields of engineering. (Prerequisite: Math. 302.)

**E.S. 307 4 Credits Fall**
**Elements of Electrical Engineering (3+3)**
Electrical fundamentals; elementary circuits and theorems; natural, forced and steady state response; principles of electronics; circuit models and system parameters; characteristics of AC and DC machines. (Prerequisite: Math. 202, or permission of the instructor.)

**E.S. 308 3 Credits Spring**
**Instrumentation and Measurement (2+3)**
Instrumentation theory and concepts digital and analog; devices; transducers, data sensing transmission; recording, and display; instrumentation system; remote sensing; hostile environmental conditions. (Prerequisite: E.S. 307.)

**E.S. 331 3 Credits Fall**
**Mechanics of Materials (2+3)**
Theory and practice of structural material. Stress-strain relationships. Torsion. Shear and moment diagrams. Beams, columns, shafts. Connections. Indeterminate analysis. (Prerequisite: E.S. 208, Math. 201.)

**E.S. 341 4 Credits Fall**
**Fluid Mechanics (3+3)**
Statics and dynamics of fluids. Basic equations of hydrodynamics, dimensional analysis, simple hydraulic machinery. (Prerequisites: E.S. 208, Math. 201.)

**E.S. 346 3 Credits Spring**
**Basic Thermodynamics (3+0)**
Systems, properties, processes, and cycles. Fundamental principles of thermodynamics (first and second laws), elementary applications. (Prerequisites: Math. 202, Phys. 212.)

**E.S. 492 Credits Arr. Fall-Spring**
**Engineering Seminar**
Oral and written exposition on current engineering topics.

## ENGLISH

**Engl. 067 3 Credits Fall**
**Engl. 068 3 Credits Spring**
**Elementary Exposition (3+0)**
For students preparing for an associate degree. Development of reading comprehension. Instruction in written expression, with practical application (such as preparing technical work results, resumes, and business correspondence) as determined by the needs of the class.

**Engl. 100 3 Credits Fall-Spring**
**Elementary English (3+0)**
For students inadequately prepared for Engl. 111. Intensive practice in written comprehension. Frequent writing assignments. Not to be substituted for required courses.

**Engl. 103 3 Credits Fall-Spring**
**Intensive Developmental English (5+0)**
An approach to problems of communication in English with special sensitivity to difference in culture and language and stylistic features which characterize informal, formal, spoken, and written usage. The balance among listening, speaking, writing, and reading will be determined by the needs of the class.

**Engl. 104 3 Credits Fall-Spring**
**Intensive Developmental English (5+0)**
Concept similar to Engl. [103 or 003], except that all material used will be correlated with a specified course in which the student is concurrently enrolled, and work will be focused on problems peculiar to that course. (May be taken a second time for credit when the correlated course is different.)

**Engl. 105 3 Credits Fall-Spring**
**Intensive Developmental Reading (5+0)**
Intensive instruction in reading designed to encourage wide reading and vocabulary improvement and to develop the reading skills necessary for successful competition in college courses. Emphasis will be on the kinds of materials encountered by freshmen. Reading clinic help will be available, utilizing various commercial materials and mechanical devices.

**Engl. 106 3 Credits Fall-Spring**
**Intensive Developmental Writing (5+0)**
A writing program emphasizing the differences between speech and writing, narrative and factual reporting, with particular emphasis on the use of connectors and other organizational devices used in the various kinds of writing done in college.

**Engl. 111 3 Credits Fall-Spring**
**Methods of Written Communication (3+0)**
Instruction in writing expository prose, including principles of order and clarity. Close analysis of appropriate texts. Introduction to research techniques.

**Engl. 211 3 Credits Fall-Spring**
**Intermediate Exposition, with Modes of Literature (2+0+1)**
Instruction in writing through close analysis of literature. Students write for weekly conferences. Research paper required. (Prerequisites: Engl. 111 and sophomore standing.)

**Engl. 213 3 Credits Fall-Spring**
**Intermediate Exposition (2+0+1)**
Instruction in writing through close analysis of expository prose from the social and natural sciences. Students write for weekly conferences. Research paper required. (Prerequisites: Engl. 111 and sophomore standing.)

NOTE: Neither English 211 nor English 213 is to be considered or is to be used as a prerequisite for any other course or for any particular course of study. Because both of these courses will be primarily courses in writing, either one of them will fulfill the second half of the requirement in written communication for the baccalaureate degree. A student who has taken one of these courses before declaring a major in which the other course may be considered more appropriate, or a student who changes his major from a field in which one of these courses is considered more appropriate than the other, will not be required to take the other course.

**Engl. 215 3 Credits Fall**
**Introduction To Poetry (3+0)**
Analysis and appreciation of the various kinds of writing in verse (lyric, narrative, and other poetry), including the terminology used to describe poetic techniques.

**Engl. 216 3 Credits Fall-Spring**
**Introduction To Fiction (3+0)**
Analysis and appreciation of selected novels and short stories, including the terminology used to describe fictional techniques.

**Engl 217 3 Credits Spring**
**Introduction To Drama (3+0)**
Analysis and appreciation of selected plays, including the terminology used to describe dramatic techniques.

**Engl. 301 3 Credits Fall-Spring**
**Survey of World Literature: From the Ancient World Through the Renaissance (3+0)**

**Engl. 302 3 Credits Fall-Spring**
**Survey of World Literature: From the Age of Reason to the Present (3+0)**
The study of literary, philosophical, and aesthetic ideas of western man as reflected in his literature.

**Engl. 303 3 Credits**
**Survey of British Literature: From Beowulf Through the Early Renaissance (3+0)**
Comprehensive study of representative writers and works in Old and Middle English and in Modern English through the earlier work of Shakespeare. (Offered annually.)

**Engl. 304 3 Credits Fall**
**Survey of British Literature: From the Late Renaissance Through the Neoclassical Period (3+0)**
Comprehensive study of representative British writers and works from the later work of Shakespeare to the end of the Eighteenth Century.

**Engl. 305 3 Credits Spring**
**Survey of British Literature: From the Romantic Period to the Present (3+0)**
Comprehensive study of representative British writers and works from the publication of *Lyrical Ballads* (1798) to the present.

**Engl. 306 3 Credits Fall**
**Survey of American Literature: From the Colonial Period to the Civil War (3+0)**
Comprehensive study of American thought as reflected in its major writers, including works representative of American Calvinism, Rationalism, Transcendentalism, and Romanticism.

**Engl. 307 3 Credits Spring**
**Survey of American Literature: From the Civil War to the Present (3+0)**
Comprehensive study of American thought as reflected in its major writers, including works representative of Realism, Naturalism, Suream-of-Consciousness, and Surealism.

**Engl. 311** **3 Credits** **Fall-Spring**
**Advanced Exposition (2+0+1)**
Instruction in writing for students who wish to develop proficiency in organizing and composing essays on factual material in which they have genuine interest. Research paper required. Course will fulfill the second half of the requirement in written communication (i.e., it may replace Engl. 211 or Engl. 213). (Prerequisites: Engl. 111, sophomore standing, and permission of instructor.)

**Engl. 318** **3 Credits** **Fall**
**Modern English Grammar (3+0)**
Study of the structure of current English as seen through recent linguistic theory and the investigation of such related topics as regional and social dialects, functional varieties, usage, and dictionaries. Recommended for all students majoring in linguistics or in elementary education and for all students with a teaching major or minor in English.

**Engl. 349** **3 Credits** **Spring**
**Aleut, Eskimo, and Indian Literature of Alaska in English Translation (3+0)**
Survey of the folklore of Alaska native peoples, including bibliography of published collections, systems of classifying the stories, and study and appreciation of selected stories representing all major native languages.

**Engl. 354** **4 Credits** **Fall**
**Survey of Canadian History and Literature: 17th Century to 1867 (4+0)**
**(Same as Hist. 354)**
History and literature of Canada from the 17th Century to Confederation taught jointly by staff members from the Departments of History and English.

**Engl. 355** **4 Credits** **Spring**
**Survey of Canadian History and Literature: 1867 to the Present (4+0)**
**(Same as Hist. 355)**
History and literature of Canada from the Confederation to the present taught jointly by staff members from the Departments of History and English.

**Engl. 401** **3 Credits** **Fall**
**World Literature: Selected Masterpieces From Homer Through Dante (3+0)**
A study of the literature and ideas of the western world with emphasis on the complete works of the major writers, including Homer, the Greek dramatists, Sappho, Virgil, Catullus, Ovid, and Dante, among others.

**Engl. 402** **3 Credits** **Spring**
**World Literature: Selected Masterpieces From Cervantes to the Present (3+0)**
A study of the literature and ideas of the western world with emphasis on the complete works of the major writers, including Cervantes, Goethe, Flaubert, Dostoevsky, Chekhov, and Kafka, among others.

**Engl. 414** **3 Credits** **Spring**
**Research Writing (3+0)**
Technical, specialized exposition, documentation, and research. Concentration on language, style, and audience in scholarly articles. Papers in students' fields prepared for conference. Students should have a definite project in mind before enrolling. (Prerequisite: permission of the instructor.)

**Engl. 421** **3 Credits** **Fall**
**Chaucer (3+0)**
Major poetry, with emphasis on *The Canterbury Tales*, and survey of Chaucerian criticism.

**Engl. 422** **3 Credits** **Fall**
**Shakespeare: History Plays and Tragedies (3+0)**
Major chronicle plays and tragedies, including significant criticism.

**Engl. 425** **3 Credits** **Spring**
**Shakespeare: Comedies and Non-Dramatic Poetry (3+0)**
Major comedies and non-dramatic poems, including significant criticism.

**Engl. 426** **3 Credits** **Spring**
**Milton (3+0)**
Major poetry and prose, and survey of Miltonian criticism.

**Engl. 444** **3 Credits** **As demand warrants**
**European Literature (3+0)**
Studies in major European writers and periods.

**Engl. 445** **3 Credits** **As demand warrants**
**20th-Century Drama: From Chekhov to Ionesco (3+0)**
The major dramatists and their achievements.

**Engl. 446** **3 Credits** **As demand warrants**
**20th-Century British and American Poetry (3+0)**
The major achievements in modern poetry, including the work of Yeats, Eliot, Pound, Lowell, Roethke, and Stevens, among others.

**Engl. 447** **3 Credits** **As demand warrants**
**20th-Century British Literature, Exclusive of Poetry (3+0)**
Fiction, drama, essays, and criticism of the major writers, including Joyce, Shaw, Woolf, Lawrence, and Orwell, among others.

**Engl. 448** **3 Credits** **As demand warrants**
**20th-Century American Literature, Exclusive of Poetry (3+0)**
Fiction, drama, essays, and criticism of the major writers. Comprehensive readings in selected authors.

**Engl. 452 3 Credits As demand warrants**
**The British Novel to 1900 (3+0)**
Origin and development of the novel with concentration on significant novelists from Daniel Defoe to Thomas Hardy.

**Engl. 462 3 Credits Spring**
**Applied English Linguistics (3+0)**
Study of the linguistic basis for such practical language activities as teaching reading and spelling, teaching English as a second language or standard English as a second dialect, teaching composition, and literary criticism. After an initial interview, students will investigate a specific areas of application. (Engl. 318 or a linguistics course is desirable, but not required.)

**Engl. 472 3 Credits Spring**
**History of the English Language (3+0)**
Origin and development of the English language from prehistoric times to the present. (Engl. 318 or a linguistics course is desirable, but not required.)

**Engl. 481 3 Credits Fall**
**Craft of Poetry (3+0)**
Intensive study of the forms and techniques used by poets, through analysis of selected poems and consideration of selected criticism.

**Engl. 482 3 Credits Spring**
**Craft of Fiction (3+0)**
Intensive study of the forms and techniques used by novelists and short story writers, through analysis of selected fiction and consideration of selected criticism.

**Engl. 483 3 Credits Fall**
**Craft of Drama (3+0)**
Intensive study of the forms and techniques used by dramatists, through analysis of selected plays and consideration of selected criticism.

**Engl. 484 3 Credits Spring**
**Craft of Non-Fiction Prose (3+0)**
Intensive study of the forms and techniques used by biographers, essayists, and writers of other non-fiction literary prose, through analysis of selected works and consideration of selected criticism. (Not a workshop. See Jour. 420 for a course in writing biography and autobiography, for which this course may serve as preparation.)

**Engl. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Engl. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Engl. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Engl. 601 3 Credits Fall**
**Bibliography, Methods, and Criticism (3+0)**
A study of the basic reference works for research in literature, the methods for conducting research, and the principles of literary criticism.

**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.

**Engl. 604 3 Credits As demand warrants**
**Studies in British Literature: Renaissance and 17th Century (3+0)**
Variable subject matter in significant topics in 16th- and 17th-Century British Literature.

**Engl. 607 3 Credits As demand warrants**
**Studies in British Literature: 18th and 19th Centuries (3+0)**
Variable subject matter in significant topics in British literature of the Augustan, Romantic, and Victorian periods.

**Engl. 608 3 Credits As demand warrants**
**Studies in British Literature: 20th Century (3+0)**
Variable subject matter in significant topics in modern British literature.

**Engl. 609 3 Credits As demand warrants**
**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.

**Engl. 612 3 Credits As demand warrants**
**Studies in American Literature: 20th Century (3+0)**
Variable subject matter in significant topics in modern American literature.

**Engl. 670 3 Credits As demand warrants**
**Studies in Comparative Literature (3+0)**
Variable subject matter in significant topics in comparative literature.

**Engl. 671 Credits Arr. Fall-Spring**
**Writers' Workshop**
The writing of verse, fiction, drama, or non-fiction prose in accordance with the individual student's needs and the instructor's specialization. Depending on available staff, the workshop may be limited during any semester to work in a particular genre, for instance, fiction. May be taken twice for a maximum of six

credits. (Prerequisites: at least two of these courses—Engl. 481, 482, 483, 484—and permission of instructor; or, permission of the Head of Department of English and of instructor.)

**Engl. 692 3 Credits Annually**
**Seminar**
Various topics. (Offered annually; admission by arrangement.)

**Engl. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Engl. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Engl. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Engl. 699 Credits Arr. Fall-Spring**
**Thesis**

## ENVIRONMENTAL QUALITY ENGINEERING

**EQS 401 3 Credits Fall**
**Environmental Quality Science Measurements (2+3)**
Theory and laboratory procedures for determining quality of water supplies. Natural water quality, pollution loads and water and wastewater treatment plant parameters. Familiarization with *Standard Methods for the Examination of Water and Wastewater*. Experiments on unit processes of treatment systems are included along with consideration for solid waste and air pollution monitoring. (Prerequisite: CE 441 or CE 441 concurrent with EQS 401 or permission of instructor.)

**EQE 402 3 Credits Spring**
**Engineering Management of Water Quality (3+0)**
Concepts, rationale, theory, institutions and engineering aspects of water quality management. Methods of water quality management; low flow augmentation, in-stream aeration; stream and estuarine analysis; ocean disposal systems; diffuser analysis and design; control of thermal effluents, industrial discharges and arctic applications. (Prerequisite: permission of instructor.)

**EQS 403 3 Credits Fall**
**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 atmoshperic emissions and their effects on man and his environment. Identification and location of sources, measurement of quality and quantity, control and regulations, economics and standards. (Prerequisite: C.E. 441 or permission of instructor.)

**EQE 604 3 Credits Spring**
**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.)

**EQE 605 3 Credits Fall**
**Chemical and Physical Water and Wastewater Treatment Processes (3+0)**
The theory and design of chemical and physical unit process utilizing the treatment of water and wastewater. Sedimentation and flotation, ion exchange, adsorption, absorption, coagulation, precipitation, filtration, disinfection, reverse osmosis and aeration theories will be studied. Design problems for all unit processes. (Prerequisite: graduate standing or permission of the instructor.)

**EQE 606 3 Credits Spring**
**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 and permission of the instructor.)

**EQE 692 Credits Arr. Fall-Spring**
**Seminar**

**EQE 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**EQE 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**EQE 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**EQE 699 Credits Arr. Fall-Spring**
**Thesis**

## ESKIMO

**Esk. 101 5 Credits Fall**
**Esk. 102 5 Credits Spring**
**Elementary Yupik Eskimo (5+0)**
Introduction to Central Yupik, the language of the Yukon and Kuskokwim deltas and Bristol Bay. Open to both speakers and nonspeakers. For speakers the course provides literacy and grammatical analysis. For others it provides a framework for learning to speak, read, and write the language. Consideration given to dialect differences.

**Esk. 108 3 Credits Spring**
**Yupik Literacy (3+0)**
Literacy training for speakers of Central Yupik. Learning to read and write the language.

**Esk. 111 5 Credits Fall**
**Esk. 112 5 Credits Spring**
**Elementary Inupiaq Eskimo (5+0)**
Introduction to Inupiaq, the language of Unalakleet, Seward Peninsula, Kotzebue Sound, and North Slope. Open to both speakers and nonspeakers. For speakers the course provides literacy and grammatical analysis. For others it provides a framework for learning to speak, read, and write the language. Consideration given to dialect differences.

**Esk. 118 3 Credits Spring**
**Inupiaq Literacy (3+0)**
Literacy training for speakers of Alaskan Inupiaq. Learning to read and write the language.

**Esk. 201 3 or 4 Credits Fall**
**Esk. 202 3 or 4 Credits Spring**
**Intermediate Eskimo (3+0) or (4+0)**
Continuation of Eskimo 101-102. Increasing emphasis on speaking, reading and writing.

**Esk. 415 3 Credits Fall**
**Advanced Yupik Eskimo (3+0)**
Advanced study in Yupik Eskimo. A continuation of Esk. 202.

**Esk. 417 3 Credits Spring**
**Advanced Inupiaq Eskimo (3+0)**
Advanced study in Inupiaq Eskimo. A continuation of Esk. 112.

**Esk. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Esk. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Esk. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Esk. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Esk. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Esk. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

## FOREIGN LANGUAGES

**For. Lang. 110 2 Credits Spring**
**How to Pronounce French, German, Italian, and Spanish (2+0)**
Designed to meet the needs of students and others in radio, television, journalism, drama, music (esp. voice), etc. who want to pronounce French, German, Italian and Spanish correctly and with confidence. The method is practical and direct. Concrete examples are used. (No prerequisites.)

**For. Lang. 393 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**For Lang. 394 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**For Lang. 397 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

## FRENCH

**Fren. 101 5 Credits Fall**
**Fren. 102 5 Credits Spring**
**Elementary French (5+0)**
Development of the four skills (listening comprehension, speaking, reading, and writing) with emphasis on oral work, practice in the language laboratory, basic grammar, and vocabulary.

**Fren. 111** 3 Credits **Fall**
**Fren. 112** 3 Credits **Spring**
**French for Reading Ability (3+0)**
Rapid acquisition of reading knowledge with attention to needs in specialized fields. Credit applicable to degrees requiring one year of a foreign language with emphasis on reading skill. (Offered as demand warrants.)

**Fren. 201** 4 Credits **Fall**
**Fren. 202** 4 Credits **Spring**
**Intermediate French (4+0)**
Continuation of Fren. 102. Increasing emphasis on reading ability and cultural material. Conducted in French. (Prerequisite: Fren. 102 or two years of high school French.)

**Fren. 301** 3 Credits **Fall**
**Fren. 302** 3 Credits **Spring**
**Advanced French (3+0)**
Discussions and essays on more difficult subjects or texts; translations, stylistic exercises, special grammatical problems, systematic vocabulary building. Conducted in French. (Prerequisite: Fren. 202 or equivalent. Next offered 1974-75.)

**Fren. 313** 3 Credits **Fall**
**Fren. 314** 3 Credits **Spring**
**French Civilization (3+0)**
History and development of the arts and of national institutions; extensive reading and classroom discussion. Conducted in French. (Prerequisite: Fren. 202. Next offered 1976-77.)

**Fren. 323** 3 Credits **Fall**
**Fren. 324** 3 Credits **Spring**
**Survey of French Literature (3+0)**
Reading of texts representative of literary currents, genres, authors, epochs. Conducted in French. (Prerequisite: Fren. 202. Concurrent or previous enrollment in Fren. 301 or 302 recommended. Next offered: 1975-76.)

**Fren. 404** 3 Credits **Spring**
**Advanced Syntax and Oral Expression (3+0)**
Continuation of Fren. 301 or 302. Analysis of difficult aspects of syntax and phonetics and practice in speaking and writing. Conducted in French. (Next offered 1976-77.)

**Fren. 439** 3 Credits **Fall**
**Literature of the Classical Age (3+0)**
Close study of outstanding literary works of different genres. Conducted in French (Offered as demand warrants.)

**Fren. 443** 3 Credits **Fall**
**19th Century French Literature (3+0)**
French literature in the 19th century; romantisme - Realisme - naturalisme idealisme - fin de siecle. Conducted in French. (Offered as demand warrants.)

**Fren. 452** 3 Credits **Spring**
**The French Novel of the 20th Century (3+0)**
Representative novelists and their works. Conducted in French. (Offered as demand warrants.)

**Fren. 467** 3 Credits **Fall**
**Contemporary French Theatre (3+0)**
Analysis of important plays, study of themes and dramatic techniques. Conducted in French. (Offered as demand warrants.)

**Fren. 472** 3 Credits **Spring**
**French Poetry (3+0)**
French poetry from the Middle Ages to the 20th century. Course conducted in French. (Offered as demand warrants.)

**Fren. 493** Credits Arr. As demand warrants
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Fren. 494** Credits Arr. As demand warrants
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Fren. 497** Credits Arr. As demand warrants
**Individual Study**
(Admission by arrangement.)

**Fren. 608** 3 Credits **Spring**
**History of the French Language (3+0)**
Study of the historical evolution of French, supplemented by an analysis of documentary texts from the main literary periods. Conducted in French. (Offered as demand warrants.)

**Fren. 635** 3 Credits **Fall**
**The Renaissance (3+0)**
Analysis of outstanding literary works and, in general, of texts representative of the main literary forces prevalent during the 16th century. Conducted in French. (Offered as demand warrants.)

**Fren. 641** 3 Credits **Fall**
**The Age of Enlightenment (3+0)**
A critical study of a variety of texts, philosophical as well as literary. Conducted in French. (Offered as demand warrants.)

**Fren. 646** 3 Credits **Spring**
**The 19th Century Novel (3+0)**
Analysis of novels ranging from romanticism to naturalism. Conducted in French. (Offered as demand warrants.)

**Fren. 692** Credits Arr. **Fall-Spring**
**Seminar**
Various topics. (Offered as demand warrants.)

**Fren. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Fren. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Fren. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Fren. 698 Credits Arr. Fall-Spring**
**Research**
(Offered as demand warrants.)

**Fren. 699 Credits Arr. Spring**
**Thesis**
(Offered as demand warrants.)

## GEOGRAPHY

Note: Geography 105, 209, 316 and 401 are Natural Science courses; all others are Social Science courses.

**Geog. 101 3 Credits Fall**
**Introductory Geography (3+0)**
World regions; an analysis of environment, with emphasis on the major culture realms.

**Geog. 103 3 Credits Fall-Spring**
**World Economic Geography (3+0)**
Study of the world's major economic activities: their physical and cultural bases, spatial growth and distribution patterns, and their significance in inter-regional and international development.

**Geog. 105 3 or 4 Credits Spring**
**Elements of Physical Geography (3+0 or 3+3)**
Description and analysis of physical environment including climate, landforms, soils, water, vegetation and their world patterns. Optional laboratory for one additional credit includes exercises related to each major unit of the course.

**Geog. 202 3 Credits Spring**
**Geography of United States and Canada (3+0)**
Regional geography of Anglo-America. Introductory systematic study of the area as a whole, followed by detailed study of the physical and cultural landscape forms, patterns, and associations of each major region in turn. Consideration of the significance of Anglo-America in current world economic and political geography.

**Geog. 209 3 Credits Fall**
**Fundamentals of Meteorology (3+0)**
**(Same as Phys. 209)**
An introductory course in meteorology for the non-specialist. Aviation weather will be included. (Prerequisite: High school algebra or permission of the instructor.)

**Geog. 301 3 Credits Spring**
**Geographic Field Research Techniques**
Theory and application of geographic methods of conducting field investigations. Collection, analysis, synthesis and interpretation of data concerning the natural and man-made features of regional environments. Preparation and presentation of reports of findings and conclusions.

**Geog. 302 3 Credits Spring**
**Geography of Alaska (3+0)**
Regional, physical and economic geography of Alaska. Special consideration of the state's renewable and nonrenewable resources, and of plans for their wise use. Frequent class study of representative maps and other audio-visual materials.

**Geog. 305 3 Credits Fall**
**Geography of Europe (except U.S.S.R.) (3+0)**
Regional, physical, economic and cultural geography of Europe, except U.S.S.R. (Prerequisite: An introductory geography course or permission of the instructor.)

**Geog. 306 3 Credits Spring**
**Geography of the Soviet Union (3+0)**
The physical, cultural and historical geography of the U.S.S.R. with special emphasis on the geographic bases of the expansion of the Great Russians and the contemporary foundation of Soviet national power. (Prerequisite: Geog. 101 or 103 or 105 or permission of the instructor.)

**Geog. 309 3 Credits Fall-Spring**
**Cartography (1+6)**
Graphic techniques for presenting geographic data through the construction of maps, projections and charts. (Admission by arrangement.)

**Geog. 311 3 Credits Fall-Spring**
**Geography of Asia (3+0)**
Regional geography of Asia, exclusive of the Soviet Union. A study of the physical framework, natural resources, peoples, major economic activities and characteristic landscapes of the major regions of Japan, China, Southeast Asia, India-Pakistan and the Asiatic countries of the Middle East. (Prerequisite: Geog. 101 or 103 or 105 or permission of the instructor.)

**Geog. 315 3 Credits Fall**
**Geography of Africa (3+0)**
Physical and cultural geography of Africa, by regions. Significance of Africa in current world cultural, economic and political geography. Major emphasis on regions south of the Sahara.

**Geog. 316 3 Credits Spring**
**Pleistocene Environment (3+0)**
Principles of Paleogeography and their application to the environments of the ice age and post-glacial times. (Prerequisite: Geog. 105 or permission of the instructor.)

**Geog. 327 3 Credits Fall**
**Cold Lands (3+0)**
The comparative physical, human and economic geography of cold regions, with particular attention to Siberia, Greenland, Scandinavia and Canada. Special attention is given to the different approaches which have been taken toward economic development in cold regions. (Prerequisite: Geog. 101 or 103 or 105 or permission of the instructor.)

**Geog. 401 3 Credits Fall-Spring**
**Weather and Climate (3+0)**
Introduction to the study of weather and classification of climates. (Prerequisite: Permission of the instructor.)

**Geog. 402 3 Credits Spring**
**Man and Nature (3+0)**
The relationship of man with the land he occupies; study of the physical environment and human occupation of the world's major regions; consideration of the significance of cultural diversity, differing patterns of livelihood, settlement and population change.

**Geog. 404 3 Credits Fall**
**Urban Geography (3+0)**
A world survey of urbanization with particular emphasis on the accelerating urban revolution in modern times. Conditions favoring the rise of cities: locational and site factors; regional and interregional resource availability; human factors. Changing functions and patterns of urban areas. National and international problems inherent in trends toward a predominantly urbanized economy and culture. Implications of urbanization in Alaska.

**Geog. 405 3 Credits Fall**
**Political Geography (3+0)**
Geographical analysis of the evolution, structure, internal coherence, and sources of strength of individual nation states, with emphasis on nations of the Pacific realm and Arctic periphery. Consideration of regional blocs, spheres of influence, and potentialities for international cooperation.

**Geog. 408 3 Credits Spring**
**Quantitative Research Techniques (2+3)**
Philosophy and methodology in geography. Theories, laws and models for measurement, analysis and explanation of geographic patterns and associations. Applications of findings to solution of geographic problems. (Prerequisites: Junior standing and college-level mathematics, or permission of the instructor.)

**Geog. 492 Credits Arr. Fall-Spring**
**Seminar**
Selected topics in geography. (Admission by arrangement.)

**Geog. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Geog. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Geog. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Geog. 692 Credits Arr. Fall-Spring**
**Seminar**
Selected topics in geography. (Admission by arrangement.)

**Geog. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Geog. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Geog. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Geog. 699 Credits Arr. Fall-Spring**
**Thesis**

## GEOLOGY

**Geol. 101 3 or 4 Credits Fall**
**General Geology (3+0 or 3+3)**
Introduction to physical geology; a study of the earth, its materials and the processes that effect changes upon and within it. Optional laboratory training in the use of topographic maps and the recognition of common rocks and minerals.

**Geol. 102 3 Credits Spring**
**Earth Sciences and Human Affairs (3+0)**
The role of Earth Science in human affairs. Earth history as a perspective for man's modern environment. Relation of earth resources and geologic hazards to human ecology. Geologic consequences of man's activities on earth. Particular emphasis on Alaska's geologic history, its physical setting and environmental problems, and its potential for future development.

**Geol. 111 4 Credits Fall**
**Physical Geology (3+3)**
An introduction to minerals and rocks, their formation and classification. Surficial and crustal geologic processes and their effects on landforms, rocks and rock structures. Laboratory emphasis on study and classification of mineral and rock hand specimens with an introduction to topographic and geologic map interpretation. Lecture combined with Geology 101, but laboratory separately scheduled. (Prerequisite: Geology, science and engineering major, or permission of the instructor.)

**Geol. 112 4 Credits Spring**
**Historical Geology (3+3)**
An introduction to geological principles and the development of the geologic time scale, the stratigraphic record and its interpretation, geosynclinal theories and plate tectonics, the fossil record and its utilization, biostratigraphy, and the evolution of the North American continent through geologic time. Laboratory work includes the reconstruction of geologic history of various regions through the use of geologic maps and structure sections and offers an introduction to invertebrate fossils. (Prerequisite: Geol. 101 or 111.)

**Geol. 213 4 Credits Fall**
**Mineralogy (2+6)**
Introduction to mineral chemistry, atomic structure, elementary crystallography, and descriptive and determinative mineralogy. Includes introduction to instrumental determinative techniques (x-ray, spectograph), simple qualitative chemical tests. (Prerequisites: Geol. 101 or 111; Chem. 105 or concurrent registration in Math. 106.)

**Geol. 214 3 Credits Spring**
**Petrology (2+3)**
Review of common rock-forming minerals; systematic study of the origin, occurrence, and description of igneous, sedimentary, and metamorphic rocks. Laboratory work involves hand lens identification of representative rocks. (Prerequisites: Geol. 213.)

**Geol. 261 3 Credits Spring**
**Geology for Engineers (2+3)**
Introduction to applied geology; study of common rocks and minerals, landforms, erosion, transport and deposition of geologic materials, engineering applications of geology. (Prerequisite: Geology, science, and engineering majors, or permission of instructor.)

**Geol. 302 3 Credits Spring**
**Marine Geology (3+0)**
Survey of marine geology, including structure and composition of ocean basins and continental margins, chemical and physical properties of marine sediments, geological processes in the oceans, physical resources, and conservation/pollution concerns. (Prerequisite: Geol. 111, 112 or permission of instructor.)

**Geol. 304 3 Credits Fall**
**Geomorphology (3+0)**
Study of the Earth's surface features and the processes which create or modify them. Application to Quaternary history, environmental science, and related fields . (Prerequisite: Geol. 101 or 111.)

**Geol. 314 3 Credits Spring**
**Structural Geology (2+3)**
Origin and interpretation of primary and secondary geologic structures. Graphical solution of structural problems. (Prerequisite: Geol. 112, Geol. 214, Phys. 105 or 211.)

**Geol. 315 3 Credits Fall**
**Optical Mineralogy (2+3)**
Theory and application of optical methods as applied to identification of minerals and rocks. Introduction to the use of the petrographic microscope and familiarization with the optical characteristics of common rock forming minerals. (Prerequisites: Geol. 111, 213.)

**Geol. 316 3 Credits Spring**
**Petrography (2+3)**
Review of the principles of optical mineralogy; and a survey of basic petrographic analytical techniques. Petrographic study of representative igneous, metamorphic and sedimentary rocks, including the recognition and interpretation of diagnostic rock fabrics and the more important rock forming minerals. (Prerequisite: Geol. 315.)

**Geol. 321 3 Credits Fall**
**Principles of Sedimentation (2+3)**
Broad survey of sediments, including origin, classification, composition, transportation, deposition and diagenesis. Laboratory instruction in methods of textural and compositional analysis. (Prerequisite: Geol. 213 or permission of instructor.)

**Geol. 350 2 Credits Spring**
**Geologic Field Methods (1+3)**
An introduction to geologic field techniques as a prerequisite to Field Geology (Geol. 351). Geologic field mapping techniques, equipment and logistics, and the presentation of field data and report preparation. (Prerequisites: junior standing in geology.)

**Geol. 351 6 Credits Summer**
**Field Geology**
Practical experience in the procedures employed in collecting and presenting the basic data obtained from the field. Includes field mapping of stratigraphic and structural problems on topographic maps, aerial photographs, plane tables maps, and presentation of

results in a professional report and finished geologic map. Students pay own transportation, subsistence and course tuition fee. Entrance by preregistration only. (Prerequisites: junior standing in geology, Geol. 350 or equivalent, and a course in surveying.)

**Geol. 362 3 Credits Fall**
**Engineering Geology (3+0)**
Application of geologic principles to engineering site exploration, foundation work and structural design. Rocks and soils; their properties and use as construction material. Special emphasis on the arctic environment. (Prerequisite: Geol. 261, or permission of instructor.)

**Geol. 401 4 Credits Fall**
**Invertebrate Paleontology (3+3)**
Study of the invertebrate phyla with fossil records. Emphasis on soft-part anatomy and classification, followed by study of hard-part anatomy of fossil groups and their classification. Recurrent emphasis on relevant biologic principles. Laboratory study on fossil materials, including a term project on an Alaskan fossil collection. (Prerequisites: Geol. 101 or 111 or by permission of instructor; Biol. 305 recommended.)

**Geol. 402 3 Credits Spring**
**Stratigraphic Paleontology (3+0)**
An introduction to Physical Stratigraphy, Paleobiology, and Biostratigraphy. Emphasis on the interpretation of past environments and correlation through the study of the sedimentary rock record and fossils. (Prerequisites: Geol. 112, Geol. 401; Geol. 321 recommended.)

**Geol. 403 3 Credits Fall**
**Environmental Geology (3+0)**
Study of the interrelationships between the geologic environment and the human community. Earth resources, geologic hazards, land-use planning, waste disposal, and pollution control. (Prerequisites: Geol. 101 or 111; Geol. 304 recommended.)

**Geol. 404 3 Credits Spring**
**Economic Geology (2+3)**
The application of geology to the exploration, valuation and exploitation of mineral deposits. (Prerequisites: Geol. 213, 314, or permission of instructor.)

**Geol. 405 3 Credits Spring**
**Geochronology (3+0)**
Study of the radiometric and biological clocks useful in geologic studies and study of the developing time scale for earth history. (Prerequisites: Upper-division standing in geology or geophysics or consent of the instructor.)

**Geol. 407 3 Credits Spring**
**Principles of Petroleum Geology (3+0)**
A broad survey of geologic principles as applied to the origin, distribution, discovery and development of petroleum. A standard introductory course. (Prerequisites: Geol. 214, 314, and 321.)

**Geol. 408 3 Credits Spring**
**Map and Air Photo Interpretation (1+6)**
Use of topographic maps, geologic maps, and aerial photographs in the analysis of geologic structures and landforms. (Prerequisite: Geol. 304.)

**Geol. 411 3 Credits Fall**
**General Oceanography (3+0)**
**(Same as OCN 411)**
Description of the oceans and ocean processes; interrelationship of disciplinary sciences to the field; historical facts of oceanography, modern developments and trends in the field. (Prerequisite: senior or graduate standing in a disciplinary science, mathematics or engineering.)

**Geol. 413 3 Credits Fall**
**Vertebrate Paleontology (2+3)**
Systematic study of the fossil vertebrate with emphasis on evolution, morphology and ecology. (Prerequisite: Geol. 112.)

**Geol. 417 3 Credits Fall**
**Introduction to Geochemistry (3+0)**
Introduction to chemistry of the earth. (Prerequisites: Chem. 105, 106, or permission of instructor.)

**Geol. 418 3 or 4 Credits Spring**
**Basic Geophysics (3+0) or (4+0)**
The basic concepts and techniques of geophysics on a global scale. Principles and limitations of seismic, magnetic and gravity observations; other geophysical measurements such as the geothermal gradient, electrical conductivity of the earth, etc. Practical aspects of the measurement and interpretation of geophysical parameters will be included for those taking the course for 4 credits. (Prerequisites: Math. 201, Phys. 106.)

**Geol. 430 2 Credits Spring**
**Computer Applications to Geology (1+3)**
An introduction to the use of the computer in geology. Basic Fortran IV programming will be taught as needed, primary emphasis will be placed on the application of computer techniques to geology. The use of the computer in statistical analysis of geologic data and in the modeling of geologic systems will be demonstrated. Numerical and analog solutions to the various models will be studied. (Prerequisites: Senior standing in geology; Math. 201, 203, A.S. 301, or permission of the instructor.)

**Geol. 462 3 Credits Spring**
**Glacial and Pleistocene Geology (3+0)**
Study of the geologic effects of glaciation and other environmental modifications resulting from Pleistocene climatic changes. Chronology of the Pleistocene epoch and techniques used in its reconstruction. (Prerequisite: Geol. 304.)

**Geol. 463 3 Credits Spring**
**Engineering Geology Case Histories (2+3)**
A continuation of Geol. 362. Application of engineering geology. Geologic problems encountered in various settings presented together with the engineering solutions. Emphasis will be on arctic environment. (Prerequisites: Geol. 362 or permission of instructor.)

**Geol. 470 2 Credits Spring**
**Environmental Workshop (2+0)**
**(Same as Min. 470)**
Problem study concerning an environmental project of local interest. (Prerequisite: Junior or senior standing and permission of the instructor.)

**Geol. 490 0 Credits Fall-Spring**
**Colloquium**

**Geol. 492 Credits Arr. Fall-Spring**
**Seminar**
Various subjects studied. (Admission by arrangement.)

**Geol. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Geol. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Geol. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Geol. 603 3 Credits Fall**
**Geol. 604 3 Credits Spring**
**Surveys in Geophysics (3+0)**
**(Same as Physics 603, 604)**
A survey of selected topics in the planetary sciences, including introductory material in each of the major research subject areas in geophysics. 603 covers earth science and 604 covers atmospheric and space science.

**Geol. 605 3 Credits Fall**
**Introduction to Glaciology (2+3)**
A broad survey of glaciology, including thermodynamics of phase relations, supercooling, nucleation, and freezing of water in laboratory samples, lakes, rivers, oceans, cloud droplets, soil and plant and animal tissue. Physical processes in seasonal and perennial snow, transformation of snow to glacier ice. Distribution and classification of glaciers, mass balance of glaciers, temperature distribution in glaciers, glacier flow, and causes of glaciation. Physical properties of, and processes in, seasonally and perennially frozen ground. Laboratory and field work. Open to juniors and seniors also. (Prerequisites: Math. 201, Phys. 106, or admission by arrangement.)

**Geol. 606 3 Credits Spring**
**Glaciology Seminar (2+3)**
Reading and discussion of selected topics in glaciological literature. Laboratory and field projects may be included. (Prerequisites: Geol. 605 or by arrangement.)

**Geol. 607 3 Credits Fall-Spring**
**Paleomagnetism (3+0)**
Description of the geomagnetic field with particular emphasis on paleomagnetism and paleomagnetic techniques. (As demand warrants.)

**Geol. 608 3 Credits Fall**
**Pleistocene Environments (3+0)**
Physical and biological aspects of Pleistocene environmental fluctuations with special reference to Alaska and the Bering Land Bridge. Multidisciplinary approach involving faculty and students from geology, biology, anthropology, and related fields. (Prerequisite: Graduate standing or permission of instructor. Offered in alternate years.)

**Geol. 610 3 Credits Spring**
**Theories of Ore Deposition (3+0)**
Theories pertaining to the origin, concentration, transport, and deposition of ore elements. (Prerequisites: Geol. 404, 417 or permission of the instructor. Offered as demand warrants.)

**Geol. 612 3 Credits Fall-Spring**
**Geology of Alaska (2+3)**
Study and interpretation of the geology of Alaska. Field trips. (Prerequisites: Geol. 102, 304, 314. Offered as demand warrants.)

**Geol. 613 3 Credits Fall**
**Advanced Marine Geology and Geophysics (3+0)**
**(Same as OCN 613)**
A global study of the geology and structure of the ocean floors and continental margins. Geophysical signatures, including heat flow, seismicity, gravity, magnetics, seismic structures, of the major tectonic elements which make up oceanic crustal plates.

**Geol. 620 3 Credits As demand warrants**
**Introduction to Physical Oceanography (3+0)**
**(Same as OCN 620 and Phys. 620)**
Physical description of the sea, physical properties of sea water, methods and measurements, boundary processes, currents, tides and waves, regional oceanography. (Prerequisite: science or engineering degree, or permission of the instructor.)

**Geol. 622 4 Credits Fall**
**Advanced Metamorphic Petrology (2+6)**
(Prerequisites: Geol. 316. Next offered in 1974.)

**Geol. 623 4 Credits Fall**
**Advanced Petrology of the Igneous Rocks (2+6)**
Geochemistry and petrology of the intrusive igneous and volcanic rocks. A comprehensive study of the chemical, mineralogy, petrogenesis, structure and geologic setting of intrusive and extrusive rocks. Laboratory work includes the petrographic study of appropriate rock suites from world-wide localities. (Prerequisite: Geol. 315.)

**Geol. 626 3 Credits Spring**
**Advanced Sedimentary Petrology**
Study of the origin of sedimentary rocks as expressed in current technical literature. Accompanied by study of hand specimens and thin sections to provide practical field and laboratory experience in describing and interpreting real rocks.

**Geol. 627 4 Credits Fall**
**Geotectonics (4+0)**
Large scale structural features, time and place in orogenesis, theories of orogenesis. (Prerequisite: Geol. 314.)

**Geol. 628 3 Credits Spring**
**Theoretical Structural Geology (2+3)**
Theoretical basis for mechanical behavior of rocks. Includes selected topics, such as mechanisms of folding, development of slaty cleavage and mechanisms of faulting. (Prerequisites: Geol. 314.)

**Geol. 629 3 Credits Spring**
**Crystal Chemistry (3+0)**
This course deals with the crystal chemistry of minerals. The course will include: a discussion of chemical bonding in solids, calculation of lattice energies, a systematic discussion of the various crystallo-chemical groups, classification of phase transformation in solids, defect crystals, an introductory treatment of the band theory of solids. (Prerequisites: physical chemistry, Geol. 417 or permission of the instructor. Offered alternate years.)

**Geol. 630 2 Credits Spring**
**Phase Equilibria of Oxide Systems (2+0)**
This course will treat the phase equilibria of important unary, binary, ternary and quarternary oxide systems. A portion of the course will be devoted to a discussion of the heterogeneous equilibria of oxide systems under conditions of varying partial pressure of oxygen. The course will conclude with a general treatment of p-t-x systems. (Prerequisites: physical chemistry, Geol. 417 or permission of the instructor. Offered alternate years.)

**Geol. 632 3 Credits Spring**
**Thermodynamics of Geologic Systems (3+0)**
Demonstrates the use of thermodynamic calculations based upon experimental data from geologically important systems as a means of interpreting natural mineral assemblages. (Prerequisites: Geol. 416, Chem. 332, or permission of the instructor. Offered alternate years. Next offered 1974.)

**Geol. 641 2 Credits Fall-Spring**
**Advanced Invertebrate Paleontology (2+0)**
In-depth study of the anatomy, classification, stratigraphic and geographic distribution, life habits, and environmental significance of selected invertebrate fossil groups.

**Geol. 643 3 Credits Fall**
**Advanced Stratigraphy (3+0)**
Investigation of various aspects of physical stratigraphy. Emphasis on current stratigraphy problems with classification, nomenclature, correlation, etc., and interpretation of sedimentary rock sequences as records of ancient sedimentary environments. Discussions drawn from current literature.

**Geol. 645 3 Credits Fall**
**Advanced Petroleum Geology (3+0)**
Selected topics in petroleum geology and petroleum exploration with emphasis on current problems using current literature. Topics include the origin and migration of petroleum and the geology of subsurface fluids. (Prerequisites: senior or graduate standing in Geology or by permission of instructor. Offered primarily in Anchorage.)

**Geol. 682 1 Credit Spring**
**Seminar in Arctic and Alpine Geomorphology (1+0)**
Surficial processes and features of high latitude and alpine environments. Emphasis on geologic role of snow, ice, and permafrost in patterned ground formation, slope evolution, and other landscape modifications. Specific applications to land use and development problems will be stressed.

**Geol. 690 0 Credits Fall-Spring**
**Colloquium**

**Geol. 692 Credits Arr. Fall-Spring**
**Seminar**
Various topics. (Admission by arrangement.)

**Geol. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Geol. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Geol. 697** **Credits Arr.** **As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Geol. 699** **Credits Arr.** **Fall-Spring**
**Thesis or Dissertation**
Transportation expenses met by the student. (Admission by arrangement.)

## GERMAN

**Ger. 101** **5 Credits** **Fall**
**Ger. 102** **5 Credits** **Spring**
**Elementary German (5+0)**
Development of the four skills (listening comprehension, speaking, reading, and writing) with emphasis on oral work, practice in the language laboratory, basic grammar and vocabulary.

**Ger. 111** **3 Credits** **Fall**
**Ger. 112** **3 Credits** **Spring**
**German for Reading Ability (3+0)**
Rapid acquisition of reading knowledge with attention to needs in specialized fields. Credit applicable to degrees requiring one year of a foreign language with emphasis on reading skill.

**Ger. 201** **4 Credits** **Fall**
**Ger. 202** **4 Credits** **Spring**
**Intermediate German (4+0)**
Continuation of German 102. Increasing emphasis on reading ability and cultural material. Conducted in German. (Prerequisite: Ger. 102 or two years of high school German.)

**Ger. 301** **3 Credits** **Fall**
**Ger. 302** **3 Credits** **Spring**
**Advanced German (3+0)**
Discussions and essays on more difficult subjects for texts. Translations stylistic exercises, special grammatical problems, systematic vocabulary building. Conducted in German. (Prerequisite: Ger. 202 or equivalent. Next offered 1975-76.)

**Ger. 313** **3 Credits** **Fall**
**Ger. 314** **3 Credits** **Spring**
**German Civilization (3+0)**
History, development of the arts and of national institutions; extensive reading and classroom discussion. Conducted in German. (Prerequisite: Ger. 202. Offered as demand warrants.)

**Ger. 321** **3 Credits** **Fall**
**Ger. 322** **3 Credits** **Spring**
**Studies in German Literature**
Choice of authors, genres or periods of German literature for intensive study. Conducted in German. Students may repeat course for credit when topic varies. (Prerequisite: Ger. 202 or equivalent. Offered as demand warrants.)

**Ger. 323** **3 Credits** **Fall**
**Ger. 324** **3 Credits** **Spring**
**Survey of German Literature (3+0)**
Reading of texts representative of literary currents, genres, authors, epochs. Conducted in German. (Prerequisite: Ger. 202. Next offered 1974-75.)

**Ger. 404** **3 Credits** **Spring**
**Advanced Syntax and Oral Expression (3+0)**
Continuation of Ger. 301 or 302. Analysis of difficult aspects of syntax and phonetics and practice in speaking and writing. Conducted in German. (Next offered 1974-75.)

**Ger. 443** **3 Credits** **Fall**
**19th Century German Literature (3+0)**
Primarily the works of Keller, Storm, Meyer, Stifter, Raabe, Fontane, Heine, Hebbel, and Grillparzer. Conducted in German. (Next offered 1976-77.)

**Ger. 445** **3 Credits** **Fall**
**Classicism (3+0)**
A study of the Classic period in German literature, including works by Lessing, Goethe, and Schiller. Conducted in German. (Next offered 1974-75.)

**Ger. 452** **3 Credits** **Spring**
**20th Century Novel (3+0)**
Primarily the works of Hesse, Mann, Kafka. Conducted in German. (Next offered 1976-77.)

**Ger. 493** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Ger. 494** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Ger. 497** **Credits Arr.** **As demand warrants**
**Individual Study**
(Admission by arrangement.)

## HISTORY

**Hist. 100** **3 Credits** **Fall**
**Heritage of Alaska Natives (3+0)**
The methodology of ethnohistory of Alaska Natives and consideration of cultural contacts, cultural breakdowns and interaction of Natives with other peoples.

**Hist. 101** **3 Credits** **Fall**
**Western Civilization (3+0)**
The origins and major political, economic, social and intellectual developments of western civilization to 1500.

**Hist. 102 3 Credits Spring**
**Western Civilization (3+0)**
Major political, economic, social and intellectual developments of western civilization since 1500.

**Hist. 121 3 Credits Fall**
**East Asian Civilization (3+0)**
The Great Tradition. Origin and development of the civilizations of China, Japan and Korea from the beginning to 1800, with emphasis on traditional social, political and cultural institutions.

**Hist. 122 3 Credits Spring**
**East Asian Civilization (3+0)**
The Modern Transformation. East Asia from 1800 to the present with emphasis on patterns of social cohesion, transition, and revolutionary change.

**Hist. 131 3 Credits Fall**
**Hist. 132 3 Credits Spring**
**History of the U.S. (3+0)**
Fall semester: the discovery of America to 1865; colonial period, revolution, formation of the constitution, western expansion, Civil War. Spring Semester: from the reconstruction to the present.

**Hist. 221 3 Credits Fall**
**Hist. 222 3 Credits Spring**
**English History (3+0)**
Fall semester: pre-Roman Britain to the end of the puritan revolution, emphasizing constitutional developments. Spring semester: from the restoration of 1660 to the present, emphasizing social and economic developments. (Offered in alternate years.)

**Hist. 230 3 Credits Fall**
**Business in American History (3+0)**
**(Same as B.A. 230)**
A survey of American Business leadership from 1790 to 1960. Dynamic business leaders, their contributions to business techniques, their problems with governmental controls, and their impact on American history will be examined. (Prerequisite: Hist. 132 or consent of instructor.)

**Hist. 261 3 Credits Fall**
**Russian History (3+0)**
Origins of Russia, Kievan Russia. The Mongol era and the rise of Muscovy. Modern Russia to the twentieth century.

**Hist. 302 3 Credits Fall**
**The French Revolution and Napoleon (3+0)**
The political, social and economic structure of the old regime; intellectual developments in the eighteenth century; the revolution and the Napoleonic period; influence of France upon European development in the eighteenth century. (Prerequisite: Hist. 102.)

**Hist. 305 3 Credits Fall-Spring**
**Europe: 1815 to 1870 (3+0)**
Political, economic, social and intellectual history. Development of industrial revolution, romantic movement and unification of Germany and Italy. (Prerequisite: Hist. 102 or permission of instructor. Offered alternate years.)

**Hist. 306 3 Credits Fall-Spring**
**Europe: 1870 to 1914 (3+0)**
Continuation of Hist. 305. The rise of socialism, imperialism, outbreak of World War I. (Prerequisite: Hist. 102 or permission of instructor. Offered in alternate years.)

**Hist. 315 3 Credits Fall**
**Europe 1914-1945 (3+0)**
World War I, the Russian Revolution, the Paris Peace Conference, Fascism, Nazism, the Stalin Revolution, the Great Depression, World War II. (Prerequisites: Hist. 101, 102 or admission by arrangement. Offered in alternate years.)

**Hist. 316 3 Credits Spring**
**Europe since 1945 (3+0)**
Germany and problems of the Peace, the Soviet Union and the Satellites, the Cold War, Economic Problems and Recovery, European Integration and the Common Market. Europe and the World. (Prerequisites: History 101, 102 or admission by arrangement.) (Offered in alternate years.)

**Hist. 320 3 Credits Fall**
**History of American Radicalism and Dissent (3+0)**
A survey of the impact of radicalism and dissent upon American history from colonial times to the 1960's. Jeffersonian Agrarianism, Abolitionism, Socialism, and twentieth century radicalism will be the key items examined. (Prerequisites: Hist. 131-132 or permission of instructor.)

**Hist. 325 3 Credits Spring**
**American Labor History (3+0)**
A topical history of the American labor movement from the 1840's to the present with particular emphasis placed upon the predecessors of the AFL-CIO. A number of alternatives to the AFL-CIO will be examined as well as the legal framework which governs present day industrial relations.

**Hist. 330 3 Credits Fall**
**Modern China (3+0)**
From 1800 to the present, with emphasis on resistance to change, rebellion, reform, revolution, and the rise of the People's Republic.

**Hist. 331 3 Credits Spring**
**Modern Japan (3+0)**
From 1600 to the present with an examination of change

within tradition, rise to world power, and the position of Japan in the modern world.

**Hist. 334 3 Credits As demand warrants**
**Diplomatic History of the United States (3+0)**
A survey of foreign relations of the United States from 1775 to the present.

**Hist. 341 3 Credits Fall**
**History of Alaska (3+0)**
The Russian background; acquisition, settlement and development of Alaska as an American territory and the 49th State. (Prerequisite: junior standing.)

**Hist. 344 3 Credits Spring**
**Twentieth Century Russia (3+0)**
Origin and development of the Soviet Union from the Revolution of 1917 to the present day; stages of economic development; Soviet government and the Communist Party. (Prerequisites: Hist. 101, 102. Offered in alternate years.)

**Hist. 350 3 Credits Fall**
**History of the People's Republic of China (3+0)**
A survey of the history of the People's Republic of China, with particular attention being given to political, economic, and social developments, from 1949 to the present.

**Hist. 354 4 Credits Fall**
**Canadian History & Literature to 1867 (4+0) (Same as Engl. 354)**
History and literature of Canada to 1867 taught jointly by staff members from the Departments of History and English.

**Hist. 355 4 Credits Spring**
**Canadian History and Literature: 1867 to the Present (4+0) (Same as Engl. 355)**
History and literature of Canada from 1867 to the present taught jointly by staff members from the Departments of History and English.

**Hist. 375 3 Credits Fall-Spring**
**History of the Northern Pacific (3+0)**
The historical development and interrelationships and problems of the North Pacific (Siberia, Canada, Alaska) from the 18th century to the present.

**Hist. 380 3 Credits Spring**
**Polar Exploration and its Literature (3+0)**
A survey of polar exploration efforts of all Western nations from A.D. 870 to the present and a consideration of the historical sources of this effort.

**Hist. 416 3 Credits Fall-Spring**
**The Renaissance (3+0)**
Political, social, economic and cultural developments in the age of the Renaissance. (Prerequisites: Hist. 101, 102. Offered in alternate years.)

**Hist. 417 3 Credits Fall-Spring**
**The Reformation (3+0)**
The Protestant and Catholic reformations. Political, economic, social and religious conflicts. 1500-1600. (Prerequisites: Hist. 101, 102. Offered in alternate years.)

**Hist. 430 3 Credits Fall-Spring**
**American Colonial History (3+0)**
Early America; European settlement; economic and social development of the American community, establishment of political independence. (Prerequisites: Hist. 131, 132. Offered in alternate years.)

**Hist. 435 3 Credits Fall-Spring**
**Civil War and Reconstruction (3+0)**
Political, economic, social and diplomatic history from 1860-77; disruption and re-establishment of the Union. (Prerequisites: Hist. 131, 132. Offered in alternate years.)

**Hist. 440 3 Credits Fall-Spring**
**The Westward Movement (3+0)**
Westward migration; establishment of new states and political institutions. Influences of the West. (Prerequisites: Hist. 131, 132. Offered in alternate years.)

**Hist. 450 3 Credits Fall-Spring**
**Twentieth Century America (3+0)**
United States from the progressive movement to the present day, with emphasis on domestic developments. (Prerequisites: Hist. 131, 132. Offered in alternate years.)

**Hist. 460 3 Credits Fall**
**American Intellectual and Cultural History: Colonial Period of 1865 (3+0)**
**Hist. 461 3 Credits Spring**
**American Intellectual and Cultural History: 1865 to Present (3+0)**
Lectures, readings, discussions. Examination of the development of American thought, including the transfer and modification of European ideas and the influence of American conditions on popular attitudes and culture. (Prerequisite: Permission of instructor.)

**Hist. 475 3 Credits Fall**
**Hist. 476 3 Credits Spring**
**Historiography and Historical Method (3+0)**
A two-semester sequence. Readings, lectures, and discussions on the nature of history, the history of historical study and writing, recent tendencies in historical scholarship, and methods of historical research. Lectures, etc., continue in the spring semester, which is devoted also to completion of two research papers begun in the fall. Lectures, discussion leadership, and direction of research papers are by the department staff.

**Hist. 481 3 Credits Fall**
**Studies in the History of Modern Japan (3+0)**
An examination of significant problems in the history of Modern Japan, with particular attention being given to the process of modernization, and to the rise of Japan as a world power. (Prerequisites: Hist. 122 or 231, or permission of the instructor for those students whose prior training or background has prepared them for study at this level.)

**Hist. 482 3 Credits Spring**
**Studies in the History of Modern East Asia (3+0)**
An examination of significant problems in the history of modern East Asia, such as a comparative study of the development of modern China and Japan, and problems of continuity and change in 19th and 20th century China, Japan and Korea. (Prerequisites: Hist. 122, Hist. 230 or Hist. 231, or permission of the instructor for those students whose prior training or background has prepared them for study at this level.)

**Hist. 492 Credits Arr. Fall-Spring**
**Seminar in Northern Studies**
An interdisciplinary seminar focusing on topics relating to the North with emphasis on the physical sciences, the peoples and the socio-economic and political aspects of the area. Specialists in the various fields will assign readings and conduct discussions.

**Hist. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Hist. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Hist. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Hist. 602 1 Credit Spring**
**The Teaching of History (1+0)**
Discussions of the problems of teaching history, the materials available, the suitability of various techniques and materials at different levels, and the use of guides, indexes, bibliographies, handbooks, atlases, etc. Required of all candidates for the M.A. in History and Master of Arts in Teaching (History).

**Hist. 691 3 Credits Fall-Spring**
**Seminar in European History (3+0)**

**Hist. 692 3 Credits Fall-Spring**
**Seminar in American History (3+0)**

**Hist. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Hist. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Hist. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Hist. 699 Credits Arr. Fall-Spring**
**Thesis**

## HOME ECONOMICS

**H.E. 102 3 Credits Fall-Spring**
**Meal Management (2+3)**
Planning, buying, preparing and serving meals. Emphasis on management, cost, and nutrition.

**H.E. 105 3 Credits Fall**
**Survey of Child Development Center Models (2+3)**
Introduction to various approaches used today in child development centers.

**H.E. 110 2 Credits Fall**
**Modern Meals (1+3)**
Planning and preparation of quick, attractive and nutritious meals for today's living. Includes outdoor cooking and use of convenience foods. Open to men and women. (Cannot be substituted for H.E. 102.)

**H.E. 113 3 Credits Fall**
**Clothing Construction and Selection I (2+3)**
Fundamental sewing processes in garment construction, using modern techniques. Clothing selection and wardrobe study, and the psychological and social significance.

**H.E. 120 3 Credits Fall**
**Child Nutrition and Health (3+0)**
Nutrition, food selection and meal planning in relation to feeding young children. Common diseases and illnesses of early childhood. Emergency first aid.

**H.E. 155 3 Credits Spring**
**Activities for Young Children (2+3)**
Selection, development and use of materials for art, literature, music, science and play activities for young children.

**H.E. 160 3 Credits Fall**
**The Art of Skin Sewing (2+3)**
Basic techniques of sewing skins including skin

selection, preparation, patterns, cutting, stitching, applied designs, as used by the Natives of the Northern Regions of Alaska.

**H.E. 211 3 Credits Fall**
**Textiles (2+3)**
Identification, structure, selection, use and care of fabrics.

**H.E. 215 2 Credits As demand warrants**
**Weaving (0+6)**
**(Same as Art 215.)**
The study of various weaving techniques, including the traditional loom weaving, different kinds of primitive weaving (backstrap loom, Inko loom, Hungarian loom, etc.), tapestry weaving, macrame, and spinning and dyeing yarns. The emphasis will be on individual creativity and experimentation within these techniques.

**H.E. 231 3 Credits Fall**
**Interior Design (3+0)**
Principles of design and color as related to planning and decorating a home.

**H.E. 236 3 Credits Fall-Spring**
**Marriage and Family Life (3+0)**
Preparation for marriage and family life; personality development, dating, courtship, engagement, morality, reproduction, conflicts, money matters, crises, divorce, religion, parenthood, and other topics.

**H.E. 241 3 Credits Fall-Spring**
**Home Management: Theory and Practicum (2+3)**
Work simplification, time, energy, money management and their application in the home.

**H.E. 245 3 Credits Fall-Spring**
**Child Development (2+3)**
**(Same as Psy. 245)**
Theory and laboratory of human mental, emotional, social, and physical development. (Prerequisites: Psy. 101, 45 semester hours, and permission of the instructor.)

**H.E. 250 3 Credits Fall**
**H.E. 251 3 Credits Spring**
**Practicum in Early Childhood Development (1+6)**
Supervised participation in a program designed for young children. Seminar attendance required. (Prerequisites: H.E. 105, 150, 155.)

**H.E. 260 3 Credits Fall**
**Advanced Skin Sewing (2+3)**
Advanced techniques and creative projects in skin sewing including parka construction; mukluks; use of power machine; methods and materials unique to Southeast and Southwest Alaska. (Prerequisite: H.E. 160 or permission of instructor.)

**H.E. 302 3 Credits Spring**
**Experimental Foods (2+3)**
Application of scientific principles to the solution of problems in food preparation. (Prerequisite: Biol. 107-108 and Chem. 103-104.)

**H.E. 304 3 Credits Fall-Spring**
**Nutrition (3+0)**
Fundamental principles of human nutrition and their application to daily living.

**H.E. 312 3 Credits Spring**
**Clothing Construction and Selection II (2+3)**
Advanced clothing problems in selection, fitting, construction, fabrics and design; modern construction techniques. (Prerequisite: H.E. 113 or admission by arrangement.)

**H.E. 401 3 Credits Fall-Spring**
**Consumer Education (3+0)**
Problems of consumers in purchasing goods and services to satisfy wants and needs. Evaluation of information sources for consumer buyers; analysis of programs for consumer protection.

**H.E. 407 3 Credits Spring**
**Parent Education (3+0)**
The role of parents in child growth and development. Past and present methods of child rearing.

**H.E. 412 3 Credits Fall-Spring**
**Clothing Problems (2+3)**
Advanced work in clothing selection and construction with emphasis on identifying and solving individual clothing problems. (Prerequisite: H.E. 312.)

**H.E. 413 3 Credits As demand warrants**
**Pattern Drafting and Draping (2+3)**
Drafting of flat patterns and draping of fabrics; construction of student-designed garments. (Prerequisite: H.E. 312.)

**H.E. 425 3 Credits Spring**
**Dynamics of Family Interaction (3+0)**
Person-centered study of many factors affecting interpersonal relationships in the family, including communication, values, goals, roles, personality, sex, children. Marital relationships described in popular fiction and actual case studies will be analyzed. (Prerequisite: Psy. 101.)

**H.E. 441 3 Credits Fall**
**Family Health (3+0)**
Family and community health; home nursing, first aid. (Offered in alternate years.)

**H.E. 442 3 Credits Fall-Spring**
**Household Equipment (3+0)**
Selection, operation, care and efficient arrangement of household equipment for family use. (Recommended prerequisite: H.E. 241. Offered as demand warrants.)

**H.E. 492 Credits Arr. Fall-Spring**
**Seminar (1+0)**
Selected topics in home economics.

**H.E. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**H.E. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**H.E. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

## HUMANITIES

**Hum. 201 3 Credits Fall**
**Unity in the Arts (3+0)**
Concentration on the interdependence of the visual arts, the performing arts and literature, as set against a specific social, political and cultural background of selected eras. (Prerequisite: Open to students beyond the freshman level or by permission of the instructor.)

**Hum. 202 3 Credits Spring**
**Unity in the Sciences (3+0)**
A detailed treatment of the scientific rudiments, methods and principles as they emerged from within a larger cultural context. Explanation of the roles of mathematics and logic in the structure of the scientific enterprise. (Prerequisite: Open to students beyond the freshman level or by permission of the instructor.)

**Hum. 329 3 Credits Fall**
**The Modern Media: Man Speaks to Man (3+0)**
Review of effects and trends in mass mddia relating man, media and culture.

**Hum. 332 3 Credits Spring**
**Varieties of Visual Expression; Art as Image and Idea (3+0)**
Discussion of the visual elements of art, principles of visual organization, the process of artistic perception and its evaluation by the viewer.

**Hum. 342 3 Credits Spring**
**Synthesis in Musical Expression (3+0)**
In-depth study of one of the classical composers to show culmination of generic efforts and inter-arts relatinships. (Prerequisites: Mus. 123 or 124, or permission of the instructor.)

**Hum. 411 3 Credits Fall**
**Dimensions of Literature (3+0)**
Systematic discussion of the medium of literary creation, of the organization of literary texts and the functions of literature. (Prerequisites: 6 credits in literature courses, or permission of the instructor.)

**Hum. 492 3 Credits Spring**
**Senior Seminar (3+0)**
Report by the instructor on the state of the humanities at the University of Alaska and on alternate approaches elsewhere. Oral presentation and defense, by the student, of their humanities project paper. (Prerequisites: Open requirements, or by permission of the instructor.)

## JAPANESE

**Jap. 101 5 Credits Fall**
**Jap. 102 5 Credits Spring**
**Elementary Japanese (5+0)**
Development of the four skills (listening comprehension, speaking, reading, and writing) with emphasis on oral work, practice in the language laboratory, basic grammar and vocabulary. Romanized Japanese text for grammar and conversation and standard Japanese text for reading.

**Jap. 201 4 Credits Fall**
**Jap. 202 4 Credits Spring**
**Intermediate Japanese (4+0)**
Continuation of Jap. 102 with increasing emphasis on reading ability and cultural material. Standard Japanese texts for reading including selections from modern Japanese literature. (Prerequisite: Jap. 102 or equivalent.)

## JOURNALISM

**Jour. 101 2 Credits Fall**
**Introduction to Journalism (2+1)**
A survey of the history and principles of journalism and the role of the information media in American society. An introduction to various professional aspects of journalism. Two lectures and one discussion weekly.

**Jour. 201 3 Credits Fall-Spring**
**News Writing (2+2)**
Structure of news stories, various news leads and feature stories; gathering and evaluating information for simple news stories; writing stories. (Prerequisite: Ability to type is essential.)

**Jour. 203 3 Credits Fall-Spring**
**Basic Photography (2+2)**
Theory and practice of picture-taking and processing; emphasis on the camera in the modern press.

**Jour. 212 3 Credits Fall-Spring**
**Editing (2+2)**
Editing copy, writing headlines and captions, and cropping and sizing pictures. (Prerequisite: Jour. 201; pre or co-requisite, Jour. 101.)

**Jour. 301 3 Credits Fall-Spring**
**Reporting (2+1)**
News gathering and writing techniques with emphasis on the vocabularies of public affairs reporting including local, state and national governments, police and the courts, labor and political party organizations. (Prerequisite: Jour. 101, 201, 212.)

**Jour. 303 3 Credits Fall-Spring**
**Advanced Photography (2+1)**
Continuation of the basic course, with emphasis on the picture story and free lance photography. (Prerequisite: Jour. 203.)

**Jour. 311 3 Credits Fall-Spring**
**Magazine Article Writing (2+1)**
Study and practice in writing articles for publication in national media. Students repeating the course limited to a total of six credits. (Admission by arrangement.)

**Jour. 320 3 Credits Spring**
**Journalism in Perspective (3+0)**
Present problems and future trends in journalism examined in the light of their historical development. (Prerequisite: junior standing.)

**Jour. 323 2 Credits Fall**
**Magazine Editing (2+0)**
Principles and problems of magazine managment and editing; content selection, design, editorial responsibility, eeconomics of publishing. (Prerequisite: junior standing.)

**Jour. 324 2 Credits Fall**
**Typography and Publication Design (1+2)**
Theory and practice of typography, layout and design, coupled with a study of the methods of printing production.

**Jour. 326 3 Credits Spring**
**Principles of Advertising (3+0)**
Theory and practice of advertising; including strategy, media use, creation and production of advertisements and measurement of advertising effectiveness. Required for business a-ministration majors; alternative to Jour. 324 for journalism majors.

**Jour. 403 3 Credits As demand warrants**
**Cinematography (2+2)**
Filming and editing news and documentary movies for television and educational purposes. (Prerequisite: Jour. 203 or instructor's permission.)

**Jour. 411 3 Credits Fall-Spring**
**Advanced Magazine Article Writing (3+0)**
Study and practice in writing advanced articles for publication in national and international media. (Prerequisite: Permission of instructor.)

**Jour. 412 3 Credits Spring**
**Advanced Editing (2+3)**
Development of sophisticated skills in copy editing and writing headlines. Includes news judgment and positioning, news flow and newsroom organization, page layout, use of pictures. Offered in alternate years. (Prerequisites: Jour. 101, 201, 212, 301.)

**Jour. 413 3 Credits Fall**
**Law of the Press (3+0)**
Study of the laws and regulations that govern the mass media; emphasis is placed on libel, censorship and copyright. (Prerequisite: Jour. 201 or permission of the instructor.)

**Jour. 420 3 Credits As demand warrants**
**Biography (3+0)**
Research and writing of biography and autobiography.

**Jour. 424 3 Credits Spring**
**Magazine Production (2+3)**
Practical experience in all phases of magazine publication, including writing, photography, editing, design, layout, advertising and circulation. Students edit and produce the magazine, ***Alaska Today***, under the supervision of journalism faculty members. (Admission by arrangement; editorial positions open to students who have completed Jour. 323.)

**Jour. 441 3 Credits Spring**
**Editorial and Critical Writing (2+1)**
Study and practice in the fields of persuasive, interpretive and evaluative writing on the professional level. Leadership role of the media in today's society. (Prerequisite: Permission of the instructor.)

**Jour. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Jour. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Jour. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Jour. 692 Credits Arr. Fall-Spring**
**Journalism Seminar**

**Jour. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Jour. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Jour. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Jour. 698 Credits Arr. Fall-Spring**
**Research**

**Jour. 699 Credits Arr. Fall-Spring**
**Thesis**

## LAND RESOURCES

**L.R. 102 2 Credits Fall**
**Conservation of Natural Resources (2+0)**
Consideration of natural resources including discussion of their biological and physical nature, aspects of use, conflicts of use, and alternative means for conservation. Majors in all fields are welcome.

**L.R. 103 1 Credit Fall**
**Conservation of Natural Resources (1+0)**
Discussion section for material covered in L.R. 102. Must be taken concurrently with L.R. 102.

**L.R. 311 3 Credits Spring**
**Soils (2+3)**
Origin and development, weathering, classification, terminology; physical and chemical properties, biology, aeration, and moisture; reaction and liming; manures and fertilizers; management; problems in Alaska. (Prerequisite: Chem. 105.)

**L.R. 321 3 Credits Fall**
**Introduction to Watershed Science (3+0)**
Detailed examination of the hydrologic cycle with emphasis on land and atmospheric phases; influences of land management techniques and alternatives emphasized. (Prerequisites: Biol. 107-108, 239, L.R. 102, 103.)

**L.R. 354 3 Credits Spring**
**Introduction to the Forest System (3+0)**
Forestry concepts unifying soil, physiological, silvicultural, wildlife, recreational, watershed, fire, and entomological relationships; concepts applied to Alaska's forest resources. (Prerequisites: Biol. 107-108, 271 and L.R. 102, 103 or permission of instructor.) permission of instructor.)

**L.R. 414 3 Credits Spring**
**Principles of Outdoor Recreation Management (3+0)**
Theories, practices, economics and problems fundamental to the use of land and related natural resources for recreation; relationship of wildland recreation in regional development. (Prerequisite: junior standing in biology or natural resources or permission of the instructor.)

**L.R. 430 3 Credits Fall**
**Land-Use Planning (3+0)**
Land use and resources planning principles and practices in the United States, with primary emphasis on the state and regional levels, and with special attention to Alaska. (Offered alternate years; next offered 1974-75.)

**L.R. 451 3 Credits Fall**
**Forest Influences (3+0)**
Relationships between climate, soil, water and forest vegetation. Elements of wildland hydrology, soil erosion control and water yield. (Prerequisite: Permission of the instructor.)

**L.R. 492 Credits Arr. Fall-Spring**
**Seminar**
Topics in land resources. (Offered as demand warrants.)

**L.R. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**L.R. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**L.R. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**L.R. 654 Credits Arr. Fall**
**Biometeorology**
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. L.R. 354 recommended.) Offered alternate years; next offered 1975-76.)

**L.R. 692 Credits Arr. Fall-Spring**
**Seminar**
Topics in land resources. (Offered as demand warrants.)

**L.R. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during na academic year.

**L.R. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**L.R. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**L.R. 699 Credits Arr. Spring**
**Thesis**
(Admission by arrangement.)

## LIBRARY SCIENCE

**Lib. Sci. 101 1 Credit Fall-Spring**
**Library Skills (0+0)**
An independent study course in college library skills and some resources and facilities common to academic libraries in general and to the Rasmuson Library in particular. No class sessions are held; the student works at his individual rate and on his own time schedule.

**Lib. Sci. 201 2 Credits Spring**
**Gen. Bibliography (2+0)**
The General Bibliography course introduces the history and organization of the world of books, the means of access to them, and the formal principles of describing them through the preparation of an annotated bibliography.

## LINGUISTICS

**Ling. 101 3 Credits Fall**
**The Nature of Language (3+0)**
A beginning course in the study of language: systematic analysis of human language and description of its grammatical structure, distribution and diversity.

**Ling. 112 3 Credits Spring**
**Structure of Language (3+0)**
Introduction to theory of language structure (syntax) and linguistic structural analysis of languages based on a transformational grammar model.

**Ling. 216 3 Credits Spring**
**Languages of the World (3+0)**
A comprehensive survey of the world's languages — both past and present. Topics to be covered include genetic relationships among languages, linguistic change, language universals, language classification and language families, as well as the interaction of culture and language. (Offered as demand warrants.)

**Ling. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Ling. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Ling. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

## MATHEMATICS

No student will be permitted to enroll in a course having prerequisites if a grade lower than C is received in the prerequisite course.

**Math. 55 3 Credits Fall-Spring**
**Elementary Algebra (3+2)**
A beginning course for students with a weak background. This course is designed to introduce the student to the basic concepts of algebra. Computational aspects of algebra are emphasized.

**Math. 103 3 Credits Fall**
**Math. 104 3 Credits Spring**
**Concepts of Mathematics (3+0)**
A cultural sequence for students requiring a year's sequence in mathematics. This course is designed to acquaint students, having a limited mathematical background, with mathematical thought and history. It emphasizes mathematical reasoning rather than formal manipulation. Topics may be chosen from number theory, topology, set theory, geometry, algebra and analysis. Not open to physical science majors and students having completed a course in calculus or beyond. Either semester may be taken separately without prerequisites.

**Math. 105 3 Credits Fall-Spring**
**Intermediate Algebra (3+2)**
A second course in algebra emphasizing solution of linear and quadratic equations and inequalities.

**Math. 106 5 Credits Fall-Spring**
**College Algebra and Trig. (5+0)**
A study of functions and their graphs. Included are the polynomial, rational, trigonometric, exponential, and logarithmic functions. Also included is a brief discussion of conic sections.

**Math. 107 3 Credits Fall-Spring**
**College Algebra (3+0)**
A study of functions and their graphs. Included are the polynomial, rational, exponential, and logarithmic functions. Credit may not be received for both Math. 106 and Math. 107.

**Math. 109 3 Credits Fall-Spring**
**Analytic Geometry (3+0)**
Rectangular coordinate system, the straight line, conic sections, transcendental curves, polar coordinates, parametric equations, and solid analytic geometry.

**Math. 110 3 Credits Spring**
**Mathematics of Finance (3+0)**
Simple and compound interest, discount, annuities, amortization, sinking funds, depreciation and capitalization. (Prerequisite: one year high school algebra or its equivalent.)

**Math. 121 4 Credits Fall**
**Math. 122 4 Credits Spring**
**Elementary Functions and Modern Algebra (4+0)**
First semester: sets, logic, groups and fields, vectors, analytic geometry, relations and functions. Second semester: complex numbers, exponential functions, logarithmic functions, trigonometry.

**Math. 161 4 Credits Fall**
**Math. 162 4 Credits Spring**
**Calculus for Business and Economics (4+0)**
Functions of one and several variables studied with special attention given to linear, polynomial, rational, logarithmic, exponential and quadratic relationships. Ordinary and partial differential calculus, integral calculus, and introductory concepts of matrix algebra will be developed. Applications include: interpretation of the derivative as a marginal quantity; use of the definite integral in investigating consumer's surplus; finding solutions of constrained optimization problems; a discussion via examples, of how matrix algebra is applied to problems of linear programming, input-output analysis, gametheory and Markov chains. (Prerequisite: Placement beyond Math. 105.)

**Math. 170 1 Credit Fall**
**The Derivative for the Life Sciences (1+0)**
Differentiation and application of derivatives. (Prerequisite: Placement beyond Math. 106.)

**Math. 171 4 Credits Fall**
**Math. 172 4 Credits Spring**
**An Introduction to Calculus for the Life Sciences (4+0)**
An investigation of mathematical topics in algebra, trigonometry and calculus for the life science student. (Prerequisite: placement beyond Math. 105.)

**Math. 200 4 Credits Fall-Spring**
**Math. 201 4 Credits Fall-Spring**
**Math. 202 4 Credits Fall-Spring**
**Calculus (4+0)**
Techniques and application of differential and integral calculus, vector analysis, partial derivatives, multiple integrals and infinite series. (Prerequisites: Math. 106 or 122.)

**Math. 203 4 Credits Fall**
**Finite Math. (4+0)**
A finite mathematics course designed for non-math majors. Topics covered include: Symbolic logic, partitions, binomial and multinomial theorems, probability, finite stochastic processes, linear algebra, Markov chain, linear programing, game theory. (Prerequisite: Math. 200 or permission of the instructor.)

**Math. 205 3 Credits Spring**
**Mathematics for Elementary School Teachers (3+1)**
Set theory, real number system and subsystems, informal geometry, relations and functions, modular arithmetic, bases, logic. (Prerequisite: Math. 105 and/or placement.)

**Math. 302 3 Credits Fall**
**Differential Equations (3+0)**
Nature and origin of differential equations; first order equations, and solutions; linear differential equations with constant coefficients, systems of equations, power series solutions, operational methods, applications. (Prerequisite: Math. 202.)

**Math. 303 3 Credits Fall**
**Introduction to Abstract Algebra (3+0)**
Introduction to sets, groups, and rings, and fields.

**Math. 304 3 Credits Spring**
**Topics in Abstract Algebra or Applied Algebra (3+0)**
Topics to be announced at the time of registration.

**Math. 305 3 Credits Upon Demand**
**Geometry (3+0)**
Topics selected from such fields as Euclidean and non-Euclidean plane geometry, affine geometry, projective geometry, topology.

**Math. 310 3 Credits Spring**
**Numerical Analysis (3+0)**
Direct and iterative solutions of systems of equations, interpolation, numerical differentiation and integration, numerical solutions of ordinary differential equations, error analysis. (Prerequisite: Math. 302.)

**Math. 312 3 Credits Spring**
**Numerical Methods for Engineers (3+0)**
Numerical methods and computer programming designed for engineering students. FORTRAN language for IBM 1620; numerical approximations, solution of differential equations, nonlinear equations, iterative and direct methods for simultaneous linear equations. Individual use of computer parallels lecture topics. (Prerequisite: Math. 302 or concurrently with Math. 302.)

**Math. 314 3 Credits Spring**
**Linear Algebra (3+0)**
Linear equations, finite dimensional vector spaces, matrices, determinants, linear transformations, characteristic values. Inner product spaces. (Prerequisite: Math. 201.)

**Math. 321 4 Credits Fall**
**Intermediate Applied Mathematics (4+0)**
Determinants and matrices, linear systems, eigenvalues and eigenvectors; vector calculus including Stoke's Theorem and divergence, gradient, and curl in orthogonal curvilinear coordinates; Fourier series and integrals. (Prerequisite: Math. 302 or concurrent enrollment in Math. 302.)

**Math. 324 3 Credits Spring**
**Advanced Calculus (3+0)**
Investigations of the limit concept with special reference to functions on the real line, sequences, and series of real numbers and integration of continuous functions. (Prerequisite: Math. 321.)

**Math. 345 3 Credits Upon Demand**
**Modern Math Concepts for the Elementary School**
Includes a study of the historical development of numeral systems together with operations in various bases. Properties of numerals and numbers are discussed. A brief study of symbolic logic precedes an investigation of the structure of arithmetic, seeking basic principles underlying operations with various number and abstract systems. A survey of informal and intuitive geometry and its relationship with number systems is included. (Prerequisite: One full year of elementary school teaching.)

**Math. 371 3 Credits Fall**
**Probability (3+0)**
Probability spaces, conditional probability, random variables, continuous and discrete distributions, expectation, moments, moment generating functions, and characteristic functions. (Prerequisite: Math. 202.)

**Math. 403 3 Credits Fall**
**Introduction to Real Analysis (3+0)**
Sets, real numbers, functions. Topology of Metric Spaces, mappings. (Prerequisite: Math. 324.)

**Math. 404 3 Credits As demand warrants**
**Topics in Analysis or Topology (3+0)**
Topics to be announced at the time of registration. (Prerequisite: Math. 403.)

**Math. 407 3 Credits Fall**
**Math. 408 3 Credits Spring**
**Mathematical Statistics (3+0)**
Distribution of random variables and functions of random variables, interval estimation, point estimation, sufficient statistics, order statistics, text of hypotheses including criteria for goodness of test. (Prerequisites: Math. 371 and A.S. 301.)

**Math. 410 3 Credits As demand warrants**
**Introduction to Complex Analysis (3+0)**
Analytic function. Cauchy's theorem. Sequences and series. (Prerequisite: Math. 324.)

**Math. 411 3 Credits Upon Demand**
**Differential Equations (3+0)**
Existence and uniqueness of ordinary differential equations. Linear systems. Geometric properties of solutions. A deeper and less computational course than Math. 302. (Prerequisite: Math. 324.)

**Math. 417 3 Credits Fall**
**Differential Geometry (3+0)**
Differential geometry of curves and space in Euclidean three-space and extensions to Riemannian n-space.

**Math. 422 4 Credits Spring**
**Intermediate Applied Mathematics (4+0)**
Topics in multi-variate calculus, Boundary Value Problems, solutions of partial differential equations of mathematical physics, complex functions. (Prerequisite: Math. 321.)

**Math. 423 3 Credits As demand warrants**
**Applied Mathematics (3+0)**
Topics to be determined at the time of registration to fit the needs of the students. (Prerequisite: Math. 422.)

**Math. 492 Credits Arr. Fall-Spring**
**Seminar**
Topics are selected according to needs and interests of the students to introduce them to independent study and research.

**Math. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Math. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Math. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Math. 601 3 Credits Fall**
**Math. 602 3 Credits Spring**
**Complex Function Theory (3+0)**
Analytic functions, singularities, analytic continuation, integration, Riemann surfaces, the logarithmic function, conformal representation. (Prerequisite: Math. 403 or admission by arrangement. Offered as demand warrants.)

**Math. 605 3 Credits Fall**
**Math. 606 3 Credits Spring**
**Real Function Theory (3+0)**
The Lebesque integral on the line, metric spaces, Banach spaces, general theory of measure and integration. (Prerequisite: Math. 403 or admission by arrangement.)

**Math. 608** 3 Credits Spring
**Partial Differential Equations (3+0)**
First and second order differential equations, boundary value problems, existence and uniqueness theorems. Green's functions, principal equations of mathematical physics. (Prerequisite: Admission by arrangement. Offered as demand warrants.)

**Math. 609** 3 Credits Fall
**Math. 610** 3 Credits Spring
**Modern Algebra (3+0)**
Groups, rings, fields, Galois theory, additional selected topics. (Prerequisite: Math. 304 or admission by arrangement.)

**Math. 611** 3 Credits Fall
**Math. 612** 3 Credits 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. (Prerequisites: Math. 320 or 406 and permission of the instructor. Offered as demand warrants.)

**Math. 692** Credits Arr. Fall-Spring
**Seminar**
Various topics. (Admission by arrangement.)

**Math. 693** Credits Arr. As demand warrants
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Math. 694** Credits Arr. As demand warrants
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Math. 697** Credits Arr. As demand warrants
**Individual Study**
(Admission by arrangement.)

**Math. 699** Credits Arr. Fall-Spring
**Thesis**

## MECHANICAL ENGINEERING

**M.E. 150** 1 Credit Fall-Spring
**Aerodynamics for Pilots (1+1)**
Nature of the atmosphere, elementary air foil theory, drag and power requirements, performance computations, and introduction to stability. For those who desire a basic understanding of flight with minimum mathematical background. (Prerequisite: high school algebra and general science.)

**M.E. 302** 4 Credits Fall-Spring
**Mechanisms (3+3)**
Kinematics and force analysis of linkages, cams and gear trains. Design of mechanisms. (Prerequisites: E.S. 208 and E.S. 331.)

**M.E. 321** 3 Credits Fall
**Industrial Processes (3+0)**
Methods and equipment used in working, welding, casting, cutting, machining, and fabricating materials.

**M.E. 401** 3 Credits Fall-Spring
**Stress Analysis (3+0)**
Introduction to elasticity, elastic stability, plates and shells, rheology, and failure mechanisms. (Prerequisites: E.S. 331 or consent of instructor.)

**M.E. 402** 3 Credits Fall-Spring
**Vibration (3+0)**
Free and forced vibration of linear systems. Matrix analysis of lumped-parameter systems. Wave propagation in continuous media. Measurement and control of sound and vibration. Self-excited and random vibration. Application to machine vibration, acoustic phenomena, and seismic response of structures. (Prerequisite: Math. 302 or consent of instructor.)

**M.E. 413** 4 Credits Fall-Spring
**Mechanical Engineering Thermodynamics (3+3)**
Continuation of E.S. 346, including vapor power cycles (Rankine, reheat, binary, and regenerative cycles); flow through nozzles and diffusers; gas power cycles; gas mixtures and psychrometrics; vapor compression refrigeration cycles. (Prerequisite: E.S. 346.)

**M.E. 414** 3 Credits Spring
**Thermal Systems (3+0)**
Introduction to power and space conditioning systems. Energy conversion, electric power distribution, heating and ventilating, total energy systems. (Prerequisite: E.S. 346.)

**M.E. 430** 3 Credits Fall-Spring
**Instruments and Controls (2+3)**
Automatic control and instrumentation of equipment including mechanical, hydraulic, pneumatic, electric, and electronic systems. (Prerequisite: Senior standing. Offered as demand warrants.)

**M.E. 441** 3 Credits Fall
**Mass and Energy Transfer (3+0)**
Heat transfer, diffusion, ablation, and flame propagation. (Prerequisite: E.S. 346.)

**M.E. 450** 3 Credits Fall-Spring
**Theory of Flight (3+1)**
Airfoil theory in subsonic and supersonic flow. Propulsion systems, stability, and performance of aircraft. (Prerequisite: E.S. 341.)

**M.E. 492 1 Credit Fall-Spring**
**Mechanical Engineering Seminar (1+0)**
Written and oral presentation of preliminary, interim, and final reports on an independent study project. (Prerequisite: Consent of instructor.)

**M.E. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**M.E. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**M.E. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**M.E. 498 Credits Arr. Fall-Spring**
**Research**
Guided study of special topics of interest to the student. (Prerequisite: approval by instructor and advisor.)

**M.E. 616 3 Credits Spring**
**Space Conditioning (2+3)**
Principles of heating, ventilating, air conditioning, and refrigeration with practical applications. (Prerequisite: M.E. 441.)

**M.E. 617 4 Credits Fall**
**Power Analysis (3+3)**
Fundamentals of power generation including piping, pumps, fuels and combustion, steam generators, condensers, deareators, evaporators, feedwater treatment and heating, regeneration, fuel handling, heat balance, equipment, economics, and plant layout. (Prerequisite: M.E. 413.)

**M.E. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**M.E. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**M.E. 699 Credits Arr. Fall-Spring**
**Thesis**
Research and thesis preparation. (Prerequisite: Graduate standing.)

## MEDICAL SCIENCE

**Med.S. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Med.S. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Med.S. 500 2 Credits Fall**
**Medicine and Society (2+0)**
Social aspects of medical care delivery and psychological aspects of disease: adjustment to chronic and terminal disease; disease in both young and aged; psychologic adjustment to society; family planning, adoption and abortion; economic aspects of health coverage; role of State and Federal agencies in health care delivery; etc. (Prerequisite: upper division standing.)

**Med.S. 505 2 Credits Fall**
**Biostatistics and Epidemiology (2+0)**
Selected biostatistical and epidemiological concepts, with emphasis on statistical thinking and medical decision-making. Collection, organization, manipulation and interpretation of data pertinent to clinical medicine; epidemiology in understanding morbidity and mortality forces; statistical methods for the solution of epidemiological problems. (Prerequisite: Medical school freshman status or upper division status and consent of instructor.)

**Med.S. 515 4 Credits Fall**
**Physiological Control (3+0+1)**
Fundamentals of physiologic control, including membrane transport, function of nervous and sensory system, muscle contraction, and introduction to cardiovascular and endocrine regulation. Emphasis on physiological control systems and feed-back concepts. Introductory pharmacology, including drug absorption, metabolism, detoxification, and excretion; mechanism of action of drugs, and variability of dose response. Major concepts illustrated by clinical conditions. (Prerequisites: Medical school freshman status or concurrent enrollment in Med.S. 551 and consent of instructor.)

**Med.S. 518 4 Credits Fall**
**Histology (3+4)**
Light and electron microscopic structure and basic functional relationships of cells, tissues and organs. Pathological alterations will be employed to emphasize the structural and functional properties of normal components. (Prerequisite: Medical school freshman status or consent of the instructor. Basic knowledge of biological chemistry is highly recommended.)

**Med.S. 519** **1 Credit** **Fall**
**Human Embryology (1+0)**
Fertilization through parturition, with emphasis on development of systems pertaining to the understanding of gross anatomy and congenital malformations. Companion course to Med.S. 520, Gross Anatomy. (Prerequisite: Medical school freshman status or concurrent enrollment in Med.S. 520 and consent of instructor.)

**Med.S. 520** **2 Credits** **Fall**
**Gross Anatomy (1+4)**
Gross anatomy of the thorax, abdomen and pelvis with special reference to commonly encountered anomalies, pathology, physical diagnosis, and surgical approach. Human dissection. (Prerequisite: Medical school freshman status or concurrent enrollment in Med.S. 518 and consent of instructor.)

**Med.S. 551** **5 Credits** **Fall**
**Physiological Chemistry (5+0)**
An interdisciplinary course in biochemistry; cytology and cytogenetics; elementary microbial physiology and genetics; mammalian metabolism, nutrition, and basic genetics. Medical problems used to illustrate major principles. (Prerequisite: Medical school freshman status or one year of organic chemistry or consent of instructor.)

## METALLURGY

**Met. 304** **3 Credits** **Spring**
**Introduction to Metallurgy (3+0)**
Definitions and principles of basic science and engineering principles as applied to process and adaptive metallurgy. (Prerequisites: Chem. 211, Phys. 212.)

**Met. 312** **2 Credits** **Spring**
**Fire Assaying (0+6)**
Sampling and preparation of ores, mill products, and smelter products for assay. Assaying gold, silver and lead. (Prerequisite: permission of the instructor. Offered as demand warrants.)

**Met. 332** **4 Credits** **Spring**
**Physical Metallurgy and Metallography (3+3)**
Properties of metals and alloys, metal crystals, chemical and metallic bonds, equilibrium diagrams, defect in metals, heat treatment, pyrometry, foundry, forging welding, principles and application of electron microscope, x-ray. Electron and x-ray diffraction. Equipment used in metallurgy. (Prerequisite: Met. 304. Offered as demand warrants.)

**Met. 493** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Met. 494** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Met. 497** **Credits Arr.** **As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Met. 693** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Met. 694** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Met. 697** **Credits Arr.** **As demand warrants**
**Individual Study**
(Admission by arrangement.)

## MILITARY SCIENCE

**Mil. 101** **2 Credits** **Fall-Spring**
**Contemporary Leadership Problems (2+1)**
Survey and analysis of current problems confronting the military leader including an introduction to the Army environment; open-ended course content which delves into real-world situations which pose requirements for action and understanding by today's leaders; rifle marksmanship laboratory; ranger orientation.

**Mil. 102** **2 Credits** **Spring**
**Military Topography and Land Navigation (2+1)**
Introduction to military and civilian topographical maps and their related informational content; use of the lensatic compass and topographical map as navigational instruments; practical exercises in orienteering; laboratory work includes fundamental individual and squad tactical exercises.

**Mil. 201** **2 Credits** **Fall**
**Fundamentals of Military Leadership (2+1)**
Functional approach to basic problems in small unit leadership including case study situations requiring problem solving analyses; a foundation leadership skills course; practical junior leadership development laboratory.

**Mil. 202** **2 Credits** **Spring**
**Communication Arts for the Military Leader (2+1)**
Emphasis is on development of functional skills in military instructional techniques and effective staff analysis using the media of written staff studies;

rehearsed and rehearsed presentations are required; practical junior leadership development laboratory.

**Mil. 301 3 Credits Fall-Spring**
**Theory and Dynamics of Tactical Operations (3+1)**
Detailed examination of the underlying concepts, principles and techniques applicable to tactical operations. Lab: Advanced leadership development including enrichment seminars. (Prerequisite: junior standing as a minimum.)

**Mil. 303 3 Credits Fall-Spring**
**Advanced Leadership (3+1)**
**(Same as B.A. 303)**
Comprehensive analysis of leadership styles and functions applicable to formal organizations. Lab: Advanced leadership development including enrichment seminars. (Prerequisite: junior standing as a minimum.)

**Mil. 401 3 Credits Fall**
**Seminar in Principles of Military Tactics (3+1)**
Survey and analysis of selected historical battles to provide insight and understanding of the multifaceted principles of tactical operations; laboratory consists of leadership role practicum and enrichment seminars.

**Mil. 402 3 Credits Spring**
**Seminar in Leadership and Management (3+1)**
Interdisciplinary investigation emphasizing military management responsibilities and roles of the commissioned officer in the areas of training, logistics, personnel and financial management; laboratory consists of leadership role practicum and enrichment seminars.

**Mil. 403 2 Credits Spring**
**ROTC Flight Training**
Thirty-five hours of ground school and 36½ hours of flight. (Prerequisites: completion of junior year of ROTC and approval of PMS and Dean. Applicants must also pass Army Flight Physical Examination and aptitude test.)

## MINERAL AND PETROLEUM TECHNOLOGY

**M.P.T. 61 3 Credits Fall**
**Math for Technicians (3+0)**
Arithmetic, trigonometry, slide rule, graphs, and computations applicable to mineral and petroleum fields.

**M.P.T. 62 3 Credits Spring**
**Mineralogy and Petrology (2+3)**
Mineral and rock identification of hand specimens. Physical characteristics and simple chemical tests.

**M.P.T. 63 2 Credits Fall**
**Map Reading and Drafting (0+6)**
Map interpretation, lettering, drafting and use of equipment.

**M.P.T. 64 3 Credits Spring**
**Measurements and Mapping (2+3)**
Use of brunton, transit, level and other surveying equipment. Map preparation.

**M.P.T. 65 3 Credits Fall**
**Science for Technicians (3+0)**
Basic principles of chemistry and physics as applicable to mineral and petroleum technology.

**M.P.T. 67 3 Credits Fall**
**Petroleum I (3+0)**
Introduction to geology of petroleum reservoirs and reservoir technology. History of petroleum in Alaska, recovery mechanisms and wellbore damage.

**M.P.T. 68 3 Credits Spring**
**Petroleum II (3+0)**
Drilling for petroleum, casing design, cementing, drilling reports, forms, etc. Problems with permafrost and types of operations, both off-shore and on-shore techniques.

**M.P.T. 69 3 Credits Fall**
**Geography and Geology (3+0)**
Introduction to geography and physical geology with emphasis to Alaska.

**M.P.T. 71 3 Credits Fall**
**Exploration Methods (2+3)**
Introduction to geochemical, geophysical and physical methods of exploration in mineral and petroleum fields.

**M.P.T. 72 3 Credits Spring**
**Milling and Metallurgy (2+3)**
Sampling and sample preparation. Methods of ore dressing on a unit and continual basis. Introduction to physical metallurgy.

**M.P.T. 73 2 Credits Fall**
**Technical Drawing (0+6)**
Drafting methods used in exploration and productions, geometric construction, orthographic projection, sectioning and pictorial representation.

**M.P.T. 74 3 Credits Spring**
**Laboratory Instrumentation and Control (2+3)**
Introduction to practical laboratory techniques, modern instrumentation methods and applications.

**M.P.T. 75 3 Credits Fall**
**Petroleum III (2+3)**
Production of petroleum. Factors determining completion practices; vapor recovery, valves, wash water handling systems, field lab methods, and corrosion control.

**M.P.T. 76 3 Credits Spring**
**Petroleum IV (3+0)**
Operations, transportation, manufacturing, and marketing. Field operation and maintenance, storage, transportation and refining of petroleum.

**M.P.T. 78 3 Credits Spring**
**Computer Applications (2+3)**
Introduction to computer applications in mineral and petroleum industries. Familiarization with FORTRAN II programming language.

**M.P.T. 80 3 Credits Spring**
**Introduction to Mineral and Petroleum Economics (3+0)**
Elements of economics, resource economics and operational cost analysis applied to mineral and petroleum production.

**M.P.T. 82 1 Credit Spring**
**Field Trip**
Field trip to observe exploration and operational functions in mineral and petroleum fields. Technical report required.

## MINERAL PREPARATION ENGINEERING

**M.Pr. 313 3 Credits Fall**
**Introduction to Mineral Preparation (2+3)**
Elementary theory and principles of unit processes of liberation, concentration, and solid-fluid separation as applied to mineral beneficiation. (Prerequisite: junior standing or permission of the instructor.)

**M.Pr. 314 3 Credits Spring**
**Unit Preparation Processes (1+6)**
Principles and practices involved in liberation and concentration by gravity, electro-magnetic and electrostatic methods. Analysis of costs and economics of mill operation. Flowsheets for different ores developed in the laboratory on a pilot plant scale. (Prerequisite: M.Pr. 313.)

**M.Pr. 406 3 Credits Spring**
**Materials Handling Systems (2+3)**
The techniques and design of systems to move ore, concentrates and waste materials in mining and milling operations. (Prerequisite: senior standing or permission of the instructor.)

**M.Pr. 418 4 Credits Spring**
**Emission Spectroscopy, X-Ray Spectroscopy, Atomic Absorption and Electron Microscopy (2+3)**
Can be taken for any combination of parts A, B, C, D as demand warrants. (Admission by special arrangement.)

M.Pr. 418A — Theory and application of emission spectrography; two one-hour classes; one three-hour lab per week for five weeks. One credit.

M.Pr. 418B — Theory and application of x-ray spectrography and diffractometer; two one-hour classes; one three-hour lab per week for five weeks. One credit.

M.Pr. 418C — Theory and application of atomic absorption spectrophotometry; two one-hour classes; one three-hour lab per week for five weeks. One credit.

M.Pr. 418D — Theory and application of electron microscope; two one-hour classes; one three-hour lab per week for five weeks. One credit.

**M.Pr. 431 2 Credits Fall**
**Applied Ore Microscopy (1+3)**
Preparation of polished sections of ores. Identifications of ore minerals in reflected light by physical, optical, and chemical methods. Applications to ore genesis, drill core interpretation, beneficiation, and process control. (Prerequisite: Geol. 213 or permission of the instructor.)

**M.Pr. 433 3 Credits Fall**
**Coal Preparation (2+3)**
Unit operations, flowsheets, washability characteristics, and control by sink-float methods for coal preparation plants. Market requirements and economics of preparation. (Prerequisite: M.Pr. 313.)

**M.Pr. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**M.Pr. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**M.Pr. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**M.Pr. 601 3 Credits Fall**
**Froth Flotation (2+3)**
Theory and application of bulk and differential froth flotation to metallic minerals, non-metallic minerals, and coal. (Admission by arrangement.)

**M.Pr. 606 3 Credits Spring**
**Plant Design (1+6)**
Selection, design and layout of equipment for erection and operation of mineral and coal beneficiation plants for specific custom and milling problems. (Admission by arrangement.)

**M.Pr. 693 Credits Arr. As demand warrants**
**Special topics**
Special topics course approved to be offered only once during an academic year.

**M.Pr. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**M.Pr. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**M.Pr. 698 3 Credits Fall-Spring**
**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; the effect of ultrasonic vibration in unit processes. (Admission by arrangement.)

**M.Pr. 699 3 Credits Fall-Spring**
**Thesis**
Application of fundamentals to the actual beneficiation problems of Alaskan ores; to produce increased effectiveness in ability to organize, interpret and present the results of research clearly, precisely, and with meaning in acceptable thesis form.

## MINING ENGINEERING

**Min. 101 3 Credits Fall**
**Minerals and Man (3+0)**
A general survey of the impact of the mineral industries on man's economic, political and environmental systems.

**Min. 102 4 Credits Spring**
**Mining Engineering Systems (4+0)**
Can be taken in any combination of parts A, B, C. Min. 102A: Introduction to mineral industries and elementary principles of exploration. Four one-hour classes per week for four weeks. One credit. Min. 102B: Utilization and application of mining explosives. Four one-hour classes for four weeks. One credit. Min. 102C: Fundamentals of mining systems for bedded, massive, vein and surface deposits. Four one-hour classes per week for eight weeks. Two credits.

**Min. 202 3 Credits Spring**
**Mine Surveying (2+3)**
Surveying principles for surface and underground control of mining properties. Field and office procedures for preparation of maps and engineering data. (Prerequisite: Math. 106.)

**Min. 311 3 Credits Fall**
**Evaluation of Engineering Data (3+0)**
Application of statistical principles and elements of probability to aid in the design and analysis of engineering experiments with special emphasis on probability models, sampling and significance testing including analysis of variance. (Prerequisite: Math. 202.)

**Min. 320 1 Credit Fall-Spring**
**Seminar and Senior Field Trip**
Mining field trip. Mines and districts, selected for exemplifying and providing instruction in geological principles, mining methods, metallurgical practices, and industrial economics. Seminar discussions cover operations and industries visited and current mineral industry problems. (Prerequisites: senior standing and permission of the instructor. Fee: field trip expenses to be paid by student. Offered as demand warrants.)

**Min. 333 2 Credits Fall**
**Mining and Mineral Leasing Law (2+0)**
History of the development of mining law; the essentials of mining laws of the United States and Alaska. Discussions and interpretation of important court decisions in mining litigation. (Offered as demand warrants.)

**Min. 400 1 Credit Spring**
**Practical Engineering Report**
Twelve weeks of practical work in some industry or project related to the students' option, or equivalent. Performed during one or more of the summer vacations prior to the fourth year. (Offered as demand warrants.)

**Min. 401 3 Credits Fall**
**Rock Mechanics (2+3)**
Analysis of stress and strain. Physical properties of rock and fundamentals of rock behavior. Rock stresses in mining with design and layout of underground workings. (Prerequisite: E.S. 331 or concurrent registration.)

**Min. 402 3 Credits Spring**
**Energy Economics (3+0)**
Economics of mineral fuels in the competitive market; regional and national projection of energy supply and demand; structure of coal, petroleum, natural gas, and uranium industries; and seminar on energy policies. (Admission by arrangement.)

**Min. 403 3 Credits Fall**
**Operations Research in Mineral Industries (2+3)**
The application of operations research techniques in mineral exploration, mineral economics, mine systems, and mineral preparation. (Prerequisite: senior standing or permission of the instructor.)

**Min. 405 3 Credits Fall**
**Geophysical and Geochemical Exploration (2+3)**
Theory and techniques of geophysical and geochemical exploration. Chemical, gravimetric, seismic, electrical, magnetic and radioactive measurements. (Prerequisites: Chem. 202, Phys. 212.)

**Min. 406 3 Credits Spring**
**Mining Plant Engineering (3+0)**
Principles of mine ventilation, haulage, hoisting, pumping and energy transmission system. (Prerequisites: Min. 102, Phys. 212 and E.S. 341.)

**Min. 408 4 Credits Spring**
**Mineral Valuation and Economics (3+3)**
Theory of sampling techniques, deposit and reserve calculations and analysis of mineral economic problems. (Prerequisite: Min. 102 or permission of the instructor.)

**Min. 470 2 Credits Spring**
**Environmental Workshop (2+0)**
**(Same as Geol. 470)**
Problem study concerning an environmental project of local interest. (Prerequisite: Junior or senior standing and permission of instructor.)

**Min. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Min. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Min. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**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. 692 Credits Arr. Fall-Spring**
**Seminar**
Reading and report required. (Admission by arrangement.)

**Min. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Min. 694 Credits Arr. As demand warrants**
**Special Topics**

Special topics course approved to be offered on a trial basis.

**Min. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Min. 699 Credits Arr. Fall-Spring**
**Thesis**

## MUSIC

**Mus. 101 1 Credit Fall-Spring**
**Chorus (0+3)**

**Mus. 109 1 Credit Fall-Spring**
**Varsity Band (0+3)**

**Mus. 203 1 Credit Fall-Spring**
**Orchestra (0+3)**

**Mus. 205 1 Credit Fall-Spring**
**Concert Band (0+3)**

**Mus. 211 1 Credit Fall-Spring**
**"Choir of the North" (0+3)**

**Mus. 307 1 Credit Fall-Spring**
**Chamber Music (0+3)**

**Mus. 313 1,2,3 Credits Fall-Spring**
**Opera Workshop (0+3, 6 or 9)**

**Mus. 151, 152 1 Credit Fall**
**Mus. 251, 252 1 Credit Spring**
**Class Lesson (0+3)**
Class instruction in piano, voice, or orchestral instrument.

**Mus. 161, 162 2 or 4 Credits Fall-Spring**
**Mus. 261, 262 2 or 4 Credits Fall-Spring**
**Mus. 361, 362 2 or 4 Credits Fall-Spring**
**Mus. 461, 462 2 or 4 Credits Fall-Spring**
**Private Lessons (1/2 or 1+1)**
Private instruction in piano, voice, or instruments. Private instruction shall consist of one private lesson and one master class per week. Music performance majors may enroll for four credits. All others will normally enroll for two credits. (Prerequisite: Admission by audition.)

## MUSIC THEORY AND HISTORY

**Mus. 103 3 Credits Fall**
**Music Fundamentals (3+0)**
Rudiments of music for students with little or no prior training in music reading.

**Mus. 123 3 Credits Fall**
**Appreciation of Music (3+0)**
Cultivation of the understanding and intelligent enjoyment of music through a study of its elements.

**Mus. 124 3 Credits Spring**
**Music in World Cultures (3+0)**
A survey of the vocal, instrumental, and dance music of selected non-Western societies, showing how the various kinds of tonal organization, instrument use, and musical behavior are related to historical and social factors.

**Mus. 131 3 Credits Fall**
**Mus. 132 3 Credits Spring**
**Basic Theory (2+3)**
First semester: Intensive training in musical skills, including sight reading, ear training dictation and keyboard. Use will be made of programmed materials in a laboratory situation as an adjunct to classroom exposition of musical materials. Second semester: Concentration upon acquisition of skill in harmonic and formal analysis and guided stylistic composition.

**Mus. 153 1 Credit Fall-Spring**
**Functional Piano (1+0)**
Instruction designed to help music majors obtain the performance, sight-reading, and harmonization - transposition skills needed to pass the Piano Proficiency Examination. It also provides non-music majors with an opportunity to study basic piano skills on a space-available basis. (Prerequisites: Music majors — Mus. 131 or equivalent or concurrent enrollment in Mus. 131; non-music majors: permission of instructor.)

**Mus. 221 3 Credits Fall**
**Mus. 222 3 Credits Spring**
**History of Music (3+0)**
Fall semester: Music before 1750. Spring semester: Music since 1750. (Prerequisite: Mus. 131-132 or permission of the instructor.)

**Mus. 223 3 Credits Fall-Spring**
**Native Alaskan Musics (3+0)**
A course to acquaint students with the variety of Alaska's unique musical systems. Open to all students, it emphasizes the broader perspective gained by an understanding of (not necessarily performance of) non-Western singing / dancing / instrumental styles.

**Mus. 231 3 Credits Fall**
**Mus. 232 3 Credits Spring**
**Advanced Theory (2+3)**
Continued study, in depth, of harmony and musical form through analysis of representative works from the standard repertoire. The second semester will be devoted to study and synthesis of 20th century stylistic and harmonic idioms. (Prerequisites: Mus. 131-132 or permission of instructor.)

**Mus. 309 3 Credits Fall-Spring**
**Elementary School Music Methods (3+0)**
**(Same as Ed. 309)**
Principles, procedures and materials for teaching music to children at the elementary level. (Prerequisite: Ed. 313 and prerequisites thereto.)

**Mus. 315 2 Credits Fall-Spring**
**Music Methods and Techniques (1+3)**
Instruction in voice and the basic instruments of band and orchestra.

**Mus. 317 1 Credit Fall-Spring**
**Arctic Chamber Orchestra (0+3)**
Chamber music.

**Mus. 331 2 Credits Fall**
**Form and Analysis (2+0)**
A detailed survey of formal and stylistic musical elements in historical context, with special application to problems of proper stylistic performance. (Prerequisite: Mus. 232 or permission of the instuctor.)

**Mus. 351 2 Credits Fall**
**Choral Conducting (2+0)**
Principles of conducting and interpretation with vocal ensembles. (Prerequisite: Mus. 232.)

**Mus. 352 2 Credits Spring**
**Instrumental Conducting (2+0)**
Principles of conducting and interpretation with instrumental ensembles. (Prerequisite: Mus. 232.)

**Mus. 405 3 Credits As demand warrants**
**Methods of Teaching Music (3+0)**
**(Same as Ed. 405)**
Methods and problems of teaching music in junior and senior high schools, with emphasis on the general music program. (Prerequisites: 100 semester hours, Ed. 332 and prerequisites thereto, and Mus. 232, or permission of the instructor.)

**Mus. 421 3 Credits Spring**
**Music in the Baroque Period (3+0)**
Style study of the music from about 1600 to 1750. Examination of style and performance practices in opera, oratorio, cantata, and other vocal forms of the period. Development of the keyboard instruments: organ, harpsichord, spinet, clavichord, virginals, and piano. Historic consideration of the instrumental

evolution; strings, winds, and brasses. Cross-cultural influences; art, literature, and paintings. Intensive listening and reading of contemporary documents in translation. Consideration of modern performance of old music. (Prerequisite: Permission of the instructor. Offered alternate years.)

**Mus. 422 3 Credits Fall**
**Music in the Classical Period (3+0)**
Musical styles from J.S. Bach through Beethoven, as exemplified by the works of Bach's sons, Haydn, Mozart, Beethoven, and others of the period. Examination of the development of sonata and concerto forms, as well as opera and chamber music. Style studies of representative examples from the works of Haydn, Mozart, and Beethoven. Musical developments in Italy, England, France, Germany and Austria. (Prerequisite: Permission of the instructor. Offered alternate years. Next offered Fall 1974.)

**Mus. 423 3 Credits Spring**
**Music in the Romantic Period (3+0)**
Study of musical trends in the 19th century. Romanticism, Nationalism, Italian Opera, and Wagnerian Music Drama, as exemplified by representative works, chosen from the music of Weber, Berlioz, Mendelssohn, Schumann, Brahms, Wagner, Chopin, Tchaikowsky, and others. Related readings in other aspects of the Romantic movement. (Prerequisite: Permission of the instructor. Offered in alternate years. Next offered Spring 1975.)

**Mus. 424 3 Credits Fall**
**Music in the Twentieth Century (3+0)**
Trends in music since 1900. Style studies of significant works from the modern repertoire. Hindemith, Bartok, Schoenberg, Stravinsky, the avant-garde, and others. (Prerequisite: Permission of the instructor. Offered alternate years. Next offered Fall 1975.)

**Mus. 431 3 Credits Fall**
**Counterpoint (3+0)**
Study of contrapuntal techniques of the sixteenth and eighteenth century, by means of analysis and synthesis of pieces in contrapuntal idioms.

**Mus. 432 3 Credits Spring**
**Orchestration and Arranging (3+0)**
Principles and practices of instrumentation and arranging for vocal and instrumental ensembles.

**Mus. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Mus. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Mus. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Mus. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Mus. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Mus. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

## OCEANOGRAPHY AND OCEAN ENGINEERING

**OCN 411 3 Credits Fall**
**General Oceanography (3+0)**
Description of the oceans and ocean processes; interrelationship of disciplinary sciences to the field; historical facts of oceanography, modern developments, and trends in the field. (Prerequisite: senior or graduate standing in a disciplinary science, mathematics or engineering.)

**OCN. 613 3 Credits Fall**
**Advanced Marine Geology (3+0)**
**(Same as Geol. 613)**
An intensive study of marine geologic problems and processes based upon extensive reading in the current literature and conducted in seminar style. (Prerequisites: senior or graduate standing in geology or appropriate interdisciplinary programs; or permission of the instructor.)

**OCN 614 3 Credits Spring**
**Marine Geophysics (3+0)**
**(Same as Geol. 614)**
Marine geophysical methods including gravity, magnetics, refraction and reflection profiling, heat flow measurements. Geophysical signatures of oceanic plates and of their accreting and consuming margins.

**OCN 620 3 Credits Fall**
**Introduction to Physical Oceanography (3+0)**
**(Same as Phys. 620 & Geol. 620)**
Physical description of the sea, physical properties of sea water, methods and measurements, boundary processes, currents, tides and waves, regional oceanography. (Prerequisite: science or engineering degree, or permission of the instructor.)

**OCN 622 3 Credits Fall**
**Ocean Currents and Water Masses (3+0)**
Theories of ocean circulation, wind currents, and boundary currents. Topographic influences on currents, origin of water masses, instruments, and observations. (Prerequisite: OCN 620 or permission of the instructor.)

**OCN 624 3 Credits Spring**
**Estuarine Dynamics (3+0)**
Kinematics and dynamics of estuarine circulation. Relations between field of motion and water mass properties. Theoretical and practical techniques for the analyses of estuarine systems. (Prerequisites: OCN 620 and Math. 302; or permission of instructor.)

**OCN 650 3 Credits Fall**
**Introduction to Biological Oceanography (3+0)**
Survey of marine plants and animals and their interrelationships with major emphasis on primary productivity and marine food chains.

**OCN 661 3 Credits Spring**
**Chemical Oceanography I (3+0)**
**(Same as Chem. 661)**
Chemical composition and properties of sea water; evaluation of salinity; pH, excess base, and carbon dioxide system; interface reactions; dissolved gases; organic components and trace inorganic components. (Prerequisites: Chem. 212, 322, 332, or permission of the instructor.)

**OCN 663 3 Credits Fall**
**Chemical Oceanography II (3+0)**
**(Same as Chem. 663)**
Selected topics in chemical oceanography, including stable isotope chemistry; chemical equilibria; chemistry of marine biota and their products; interaction of sediments and water; material exchange through sea air interface; marine photosynthesis and special topics of marine biochemistry; chemical technology as applied to oceanography; raw materials and industrial utilization. (Prerequisite: OCN 661, or permission of the instructor.)

**OCE 670 3 Credits As demand warrants**
**Waves and Tides (3+0)**
**(Same as C.E. 670)**
Generation and propagation of waves at sea, theory of waves, wave spectra and forecasting, observation and recording of ocean waves, tsunamis, tides, and internal waves.

**OCE 672 3 Credits Fall**
**Underwater Acoustics (3+0)**
**(Same as E.E. 672)**
Nature of sound, units and standards, sound-related characteristics of sea water, transmission and transmission losses, effect of discontinuities, reverberation, and measurement techniques.

**OCE 674 3 Credits As demand warrants**
**Marine Hydrodynamics (3+0)**
**(Same as C.E. and Phys. 674)**
Mechanics of fluids on a rotating earth. Navier Stoke's equations, boundary layer phenomena, turbulent flow, and applications of hydrodynamics to motion of stratified fluids such as the atmosphere and ocean.

**OCE 676 3 Credits Fall**
**Coastal Engineering (3+0)**
**(Same as C.E. 676)**
Review of deep and shallow water waves, littoral drift, coastal structures, pollution problems, harbor seiches. (Prerequisite: OCE 670.)

**OCE 680 3 Credits Fall-Spring**
**Ocean Engineering Field Work (3+0)**
Field experience either on a vessel or at an ocean engineering site selected by the student in consultation with his graduate committee. Usual duration of the field work is approximately two months.

**OCN 690 0 Credits Spring**
**Colloquium**

**OCN 692 1 Credit Fall-Spring**
**Seminar**

**OCN 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**OCN 694 Credits Arr. As demand warrants**
**Special topics**
Special topics course approved to be offered on a trial basis.

**OCN 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**OCN 699 Credits Arr. Fall-Spring**
**Thesis**

## OFFICE ADMINISTRATION

**O.A. 61 3 Credits Fall**
**Clerical Skills (3+0)**
Instruction in filing, responsibilities and duties of a clerical worker.

**O.A. 63 3 Credits Fall-Spring**
**Adding and Calculating Machines (1+2)**
Basic operation of adding, calculating and key punch machines.

**O.A. 65 3 Credits Fall**
**Machine Transcription (3+0)**
Transcription from various voice-writing machines

with special emphasis on spelling, word choice, and grammar.

**O.A. 66 3 Credits Spring**
**Machine Transcription (3+0)**
Transcription training, with emphasis on mailable material, efficient office routine, setting up letters.

**O.A. 99 6 Credits Spring**
**Office Practicum (2+10)**
**(Same as O.A. 299)**

**O.A. 101 4 Credits Fall**
**Beginning Shorthand (4+0)**
Gregg Shorthand, Diamond Jubilee Series. Shorthand writing of practiced material demonstrating all principles; unfamiliar material of short duration.

**O.A. 102 4 Credits Spring**
**Intermediate Shorthand (4+0)**
Intermediate Gregg Shorthand for secretarial students. Reinforce theory principles; emphasis upon speed dictation practice and introduction to transcription practice. (Prerequisite: O.A. 101 or equivalent and ability to type.)

**O.A. 103 3 Credits Fall-Spring**
**Elementary Typewriting (3+0)**
Beginning course in typewriting with emphasis on correct techniques, development of speed and accuracy, and business use applications; learning to use typewriting as a tool of literacy and communication. Introduction to centering, typing of personal and business letters, envelopes, simple tables and manuscripts, use of carbon paper and methods of error correction.

**O.A. 105 3 Credits Fall-Spring**
**Intermediate Typewriting (3+0)**
Speed and accuracy development and application of typewriting skill to special letter problems, tabulations, manuscripts, duplicating and other office typing problems. (Prerequisite: one year of high school typewriting or O.A. 103.)

**O.A. 106 3 Credits Fall-Spring**
**Advanced Typewriting (3+0)**
Typing of letters with special problems, legal documents, and forms, statistical tabulations, including financial reports, and the problem-solving approach to the completion of various typing problems. Use of the IBM Executive Typewriter (proportional spacing machine). Emphasis on speed, accuracy and office standards. (Prerequisites: O.A. 105 or equivalent and speed of 40 words per minute.)

**O.A. 109 2 Credits Fall-Spring**
**Magnetic Tape and/or Magnetic Card Selectric Typewriter (1+3)**
Instruction and practice in the use of the IBM Magnetic Tape Selectric Typewriter, two tape station, and/or Magnetic Card Selectric Typewriter. These machines are electric typewriters with the capacity to record signals on magnetic tape or magnetic card and play back automatically at a rapid speed. (Prerequisites: Ability to use an electric typewriter, speed of 45 words a minute, and knowledge of business-style typing.)

**O.A. 201 3 Credits Fall**
**Advanced Shorthand (3+1)**
Intensive dictation practice; emphasis on speed building. Theory review with emphasis on highspeed shortcuts and technical vocabulary and transcription techniques. (Prerequisite: O.A. 102 and O.A. 106 or equivalents.)

**O.A. 202 4 Credits Spring**
**Advanced Dictation and Transcription (4+0)**
Technical and conference editing and reporting; transcription with emphasis on production of mailable copy. Comprehensive review is provided. (Prerequisites: O.A. 101, O.A. 102, 105 and 201. O.A. 201 may be omitted with permission of instructor.)

**O.A. 203 3 Credits Fall-Spring**
**Office Machines (3+0)**
Basic operation and application of current office machines. (Prerequisite: O.A. 105 or equivalent.)

**O.A. 208 3 Credits Fall-Spring**
**Machine Transcription and Filing (3+0)**
Developing proficiency in machine transcription; principles and practical applications of filing. (Prerequisite: O.A. 105 or equivalent.)

**O.A. 231 3 Credits Fall**
**Business Communications (3+0)**
Applies the techniques of written communications to situations that require problem solving and an understanding of human relations. Emphasis on clarity, accuracy, and effectiveness in composing and evaluating various kinds of communications that commonly pass between a businessman and his associates, customers, and dealers. Included will be inter-office memos, letters, reports. (Prerequisites: Engl. 111 and ability to type.)

**O.A. 299 6 Credits Spring**
**Office Practicum (2+10)**
The student is placed in a business office which is related to her educational program and occupational objective for ten hours a week with two additional hours a week in a seminar with the coordinator to deal with any problems encountered on the job or with any remedial work necessary as indicated by the weekly evaluation of the student by the office supervisor. (Prerequisite: Admission by permission of the instructor.)

**O.A. 302 3 Credits Spring**
**Executive Secretarial Procedures (3+0)**
Duties, responsibilities and personal qualities of the secretary; human relations in the business office; secretarial training projects that require the application of the various secretarial abilities; intricate office practices in higher level secretarial duties; office ethics. (Prerequisite: junior standing, or by permission of the instructor.)

**O.A. 351 1 Credit Fall-Spring**
**Readings in Office Administration (1+0)**
Readings in current problems, practices, procedures, methods. Not more than two credits to be earned by any one student.

**O.A. 360 3 Credits Fall-Spring**
**C.P.S. Coaching (3+0)**
Review of current professional literature, a study of material covered in recent C.P.S. examinations, and solving of problems under examination conditions. Guidelines of the course are the requirements for the C.P.S. examination. (Prerequisite: senior standing or permission of the instructor.)

**O.A. 408 3 Credits As demand warrants**
**Methods of Teaching Business Subjects (3+0)**
**(Same as Ed. 408)**
Organization and content of high school business education courses; equipping a business education department, including selection, care, and maintenance; methods in teaching bookkeeping, typewriting, shorthand, and transcription. (Admission by arrangement. Prerequisites: 100 semester hours, Ed. 332 and prerequisites thereto.)

**O.A. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**O.A. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**O.A. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**O.A. 499 6 Credits Spring**
**Office Practicum (2+10)**
Description same as O.A. 299.

## PEACE ARTS

**Pc.A. 492 Credits Arr. Fall-Spring**
**Seminar**
An interdisciplinary seminar designed to focus on the nature, causes, and effects of war and the establishment and maintenance of peace. Offered in alternate years; next offered in 1974-75.

## PETROLEUM

**Pet. 101 3 Credits Fall-Spring**
**Introduction to the Petroleum Industry (3+0)**
A survey of the petroleum industry from exploration through refining. (Prerequisite: freshman standing.)

**Pet. 201 3 Credits Fall**
**Petrophysics (3+0)**
Physical properties of reservoir rocks: permeability; relative permeability; surface tension; wettability; porosity; formulation resistivity factor. Properties of petroleum fluids: behavior of gases; solubility of gases; formation volume factor; compressibility; viscosity; phase behavior. (Prerequisite: Math. 106 or consent of instructor.)

**Pet. 302 3 Credits Spring**
**Oil Well Design and Production (3+0)**
Fundamental principles underlying the analysis, design and engineering of petroleum production systems. (Prerequisites: Phys. 211, Math. 201 or permission of the instructor.)

**Pet. 304 3 Credits Spring**
**Petroleum Reservoir Engineering (3+0)**
Quantitative study and behavior prediction of volumetric and water drive oil and gas reservoirs by material balance. (Prerequisites: Math. 201 and Phys. 212.)

## PHILOSOPHY

**Phil. 201 3 Credits Fall-Spring**
**Introduction to Philosophy (3+0)**
Terms, concepts, and problems as reflected in writings of great philosophers. (Prerequisites: Sophomore standing and permission of the instructor.)

**Phil. 202 3 Credits Spring**
**Introduction to Eastern Phil. (3+0)**
Basic assumptions, problems conclusions of the major philosophical traditions of the Far East. (Prerequisite: Phil. 201 or permission of the instructor.)

**Phil. 204 3 Credits Spring**
**Introduction to Logic (3+0)**
Principles of deductive and inductive logic, application of these laws in science and other fields; brief introduction to symbolic logic and its applications. (Prerequisite: Sophomore standing.)

**Phil. 321 3 Credits Fall**
**Aesthetics (3+0)**
The nature of aesthetic experience in poetry, music,

painting, sculpture and architecture; studies in relation to artistic production and the role of art in society. (Offered in alternate years; next offered in 1973.)

**Phil. 332 3 Credits Spring**
**Ethics (3+0)**
Examination of ethical theories and basic issues of moral thought. (Offered in alternate years; next offered in 1974.)

**Phil. 341 3 Credits Fall**
**Epistemology (3+0)**
The nature of knowledge, truth and certainty. (Prerequisite: Phil. 201. Offered in alternate years, next offered in 1974.)

**Phil. 342 3 Credits Spring**
**Metaphysics (3+0)**
The nature of reality comprising both ontology and cosmology. (Prerequisite: Phil. 201. Offered in alternate years; next offered in 1975.)

**Phil. 351 3 Credits Fall**
**History of Philosophy (3+0)**
Ancient and medieval periods. (Prerequisite: six credits in philosophy or social science.)

**Phil. 352 3 Credits Spring**
**History of Philosophy (3+0)**
Renaissance, modern and recent periods. (Prerequisite: six credits in philosophy or social science.)

**Phil. 471 3 Credits Fall-Spring**
**Contemporary Philosophical Problems (3+0)**
Ideological issues facing the modern world. (Prerequisite: nine credits in philosophy or permission of the instructor.)

**Phil. 481 3 Credits Fall**
**Philosophy of Science (3+0)**
Comparison and discussion of various contemporary methodological positions. (Prerequisite: Junior standing.)

**Phil. 482 3 Credits Spring**
**Comparative Religion (3+0)**
Seven world faiths represent answers to questions of man's duty, his destiny and his nature. (Prerequisite: Permission of the instructor.)

**Phil. 483 3 Credits Spring**
**Philosophy of Social Science (3+0)**
Comparison and analysis of various contemporary methodological positions in the social sciences. (Prerequisite: Junior standing.)

**Phil. 484 3 Credits Spring**
**Philosophy of History (3+0)**
Critical examination of the nature of history and historical inquiry. (Prerequisite: nine credits in philosophy or social science.)

**Phil. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Phil. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Phil. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

## PHYSICAL EDUCATION

**P.E. 100 1 Credit Fall-Spring**
**Physical Education Activities and Instruction (0+3)**
Instruction, practice and activity in a variety of physical activities, sports and dance. Prescribed appropriate uniforms required for participation in all activities.

**Professional Courses:** The courses listed below are primarily for Physical Education majors and minors, but others may be admitted by permission of the instructor.

**P.E. 201 2 Credits Fall**
**Introduction to Health, Physical Education and Recreation (2+0)**
A survey course to acquaint students with vocations, academic discipline and programs in health, physical education and recreation.

**P.E. 242 3 Credits As demand warrants**
**Personal and Community Health (3+0)**
Development of positive health attitudes; principles and practices of personal and community health.

**P.E. 246 2 Credits As demand warrants**
**First Aid (2+0)**
Knowledge and skills necessary to provide efficient aid and treatment in emergencies.

**P.E. 301 2 Credits Fall**
**Theory of Coaching Basketball (Men) (2+0)**
Methods of coaching and training basketball teams; strategy, methods and psychology of offense and defense.

**P.E. 302 2 Credits Fall**
**Techniques in Physical Education—Track and Field (1+3)**
Methods and practice in teaching track and field

activities. (Prerequisite: performance-and-knowledge competency in track and field actvities.)

**P.E. 303 2 Credits Spring**
**Techniques in Physical Education—Team Sports (1+3)**
Methods and practice in teaching team sports and activities. (Prerequisite: performance - and - knowledge competency in certain team sports.)

**P.E. 304 2 Credits Spring**
**Techniques in Physical Education—Winter Sports (1+3)**
Methods of teaching skills and coaching teams in snow and ice sports. (Prerequisite: performance - and - knowledge competency in certain ice and snow sports.)

**P.E. 305 2 Credits Fall**
**Techniques in Physical Education—Individual and Dual Sports and Activities (1+3)**
Methods and practice in teaching selected individual and dual sports and activities for men and women. (Prerequisite: basic performance - and - knowledge competency in certain individual and dual sports and activities.)

**P.E. 308 3 Credits Spring**
**Physical Education for the Elementary School (2+3)**
**(Same as Ed. 308)**
Philosophy, source, materials, games, rhythmics, group activities, and program planning; participation required to gain skills and techniques of teaching activities for elementary grade children. (Prerequisites: Ed. 313 and prerequisites thereto.)

**P.E. 311 3 Credits Fall**
**History and Principles of Physical Education (3+0)**
The role of sports and physical education from ancient to contemporary societies, with consideration of principles and philosophy of physical education; overview of biological, psychological, and sociological foundations of physical education. (Prerequisite: P.E. 201.)

**P.E. 321 1 Credit Fall-Spring**
**Practicum in Physical Education (0+3)**
Student serves as student-assistant in P.E. 100 class, or obtains an equivalent experience in a local school or recreation program. (Prerequisite: Approval of the department head. May be repeated for a maximum of 4 credits.)

**P.E. 331 2 Credits Fall**
**Sports Officiating (1+3)**
Ethics of sports officiating; mastery, interpretation, and application of sports rules; laboratory consists of game officiating in the intramural program.

**P.E. 332 2 Credits Spring**
**Intramural Sports (2+0)**
Organization, activities and conduct of intramural sports program.

**P.E. 400 2 Credits Spring**
**Techniques in Physical Education—Tumbling and Gymnastics (1+3)**
Methods and practice in teaching tumbling and apparatus gymnastics. Separate men's and women's sessions. (Prerequisite: Performance - and - skill competency in tumbling and apparatus gymnastics.)

**P.E. 406 3 Credits As demand warrants**
**Methods of Teaching Physical Education (3+0)**
**(Same as Ed. 406)**
Selection of materials and presentation methods for secondary school physical education. (Prerequisites: 100 semester hours. Ed. 332 and prerequisites thereto.)

**P.E. 408 2 Credits Spring**
**Techniques in Physical Education—Aquatics (1+3)**
Methods and practice in teaching aquatics skills and sports. (Prerequisite: performance - and - knowledge competency in aquatics.)

**P.E. 410 2 Credits Spring**
**Techniques in Physical Education—Rhythms (1+3)**
Methods and practice in teaching rhythmic activities and dance. (Prerequisite: Performance - and - knowledge competency in rhythms.)

**P.E. 413 2 Credits Fall**
**Techniques in Physical Education—Physical Conditioning and Fitness (1+3)**
Methods and practice in planning, teaching, and supervising conditioning and fitness activities for men and women. (Prerequisite: performance - and - knowledge competency in physical fitness.)

**P.E. 421 3 Credits Fall**
**Physiology of Exercise (2+3)**
Physiological adaptations of the human body to muscular activity in exercise and sports under different environmental conditions. Effects of exercise on circulatory, respiratory, digestive, and nervous systems. Relationships of endurance, training, nutrition, temperature, and altitude to physical performance. (Prerequisite: Biol. 210.)

**P.E. 425 3 Credits Fall**
**Organization and Administration of Physical Education (3+0)**
Philosophy, methodology, and problems of planning organizing and directing the total physical education program at the secondary school level. (Prerequisite: P.E. 311.)

**P.E. 432** **3 Credits** **Spring**
**Bio-Mechanics of Exercise and Sports (3+0)**
Mechanics of human movement: mechanical and muscular analysis of human movement patterns, especially in exercise and sports. Anatomical concepts and physical laws applied to joint and muscular action. (Prerequisite: Biol. 201.)

**P.E. 440** **2 Credits** **As demand warrants**
**Prevention and Care of Athletic Injuries (2+1)**
Athletic injuries; practical and theoretical aspects of taping, bandaging and massage; physical therapeutic procedures. (Prerequisite: Biol. 201.)

**P.E. 493** **Credits Arr.**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**P.E. 494** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**P.E. 497** **Credits Arr.** **As demand warrants**
**Individual Study**
(Admission by arrangement.)

**P.E. 693** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**P.E. 694** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**P.E. 697** **Credits Arr.** **As demand warrants**
**Individual Study**
(Admission by arrangement.)

## PHYSICS

**Phys. 103** **4 Credits** **Fall**
**Phys. 104** **4 Credits** **Spring**
**College Physics (3+3)**
Unified classical and modern physics. (Prerequisite: High school algebra and geometry.)

**Phys. 105** **4 Credits** **Fall**
**Phys. 106** **4 Credits** **Spring**
**University Physics (3+3)**
Unified classical and modern physics using vectors and calculus. (Prerequisite: Concurrent enrollment in Math. 200 or permission of the instructor.)

**Phys. 209** **3 Credits** **Fall**
**Fundamentals of Meteorology (3+0)**
**(Same as Geog. 209)**
An introductory course in meteorology for the non-specialist. Aviation weather will be included. (Prerequisite: High school algebra or permission of the instructor.)

**Phys. 211** **4 Credits** **Fall**
**Phys. 212** **4 Credits** **Spring**
**General Physics (3+3)**
Classical and modern physics using vector calculus. (Prerequisites: Phys. 103, Phys 105, or E.S 111; Math. 200 and Math. 201 taken concurrently; or permission of the instructor.)

**Phys. 275** **3 Credits** **Fall**
**Phys. 276** **3 Credits** **Spring**
**Astronomy (3+0)**
Science elective for the general student. Fall semester: The solar system, laws of motion, nature of radiation, astronomical instruments, the earth, the moon, planets, comets and meteors, cosmogony. Spring semester: Stellar astronomy, physical properties and distribution of stars, interstellar matter, evolution of stars, galactic structure and cosmology. Evenning demonstrations both semesters. (Prerequisite: Sophomore standing; high school algebra and trigonometry; Physics 275 for Physics 276 or with permission of instructor. Offered as demand warrants.)

**Phys. 280** **1 Credit** **Fall-Spring**
**Shop Technique (0+3)**
Elements of machine tool operations, welding, soldering, glass blowing, high vacuum technique. Rudiments of apparatus construction. Shop project. Enrollment limited. (Prerequisite: Permission of the instructor. Offered as demand warrants.)

**Phys. 281** **1 Credit** **Fall**
**Phys. 282** **1 Credit** **Spring**
**Astronomy Laboratory (0+3)**
Laboratory experiments in gravitation, geometric optics, physical optics, radiometry, photoelectricity, spectrophotometry and spectroscopy illustrating and supplementing Phys. 275, 276. (Prerequisite: Sophomore standing; Phys. 281 not required for 282. Offered as demand warrants.)

**Phys. 293** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Phys. 294** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Phys. 297 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Phys. 301 3 Credits Fall**
**Phys. 302 3 Credits Spring**
**Applied Physics (2+3)**
Applied physics for non-majors. Electronics, atomic structure and spectra, nuclear structure and reactions. (Prerequisites: Math. 106 or 122. Offered as demand warrants.)

**Phys. 311 4 Credits Fall**
**Mechanics I (4+0)**
Newtonian mechanics, motion of systems of particles, rigid body statics, moving and accelerated coordinate systems, and introduction to Lagrangian mechanics. (Offered in alternate years. Next offered 1975.)

**Phys. 312 4 Credits Spring**
**Mechanics II (4+0)**
Mechanics of deformable media, wave motion; acoustics, introduction to tensors, rigid body dynamics, and theory of small vibrations. (Offered in alternate years. Next offered 1976.)

**Phys. 313 4 Credits Spring**
**Thermodynamics and Statistical Physics (4+0)**
Thermodynamic systems, equations of state, the laws of thermodynamics, changes of phase, thermodynamics of reactions, kinetic theory, and introduction to statistical mechanics. (Offered in alternate years. Next offered 1974.)

**Phys. 331 3 Credits Fall**
**Phys. 332 3 Credits Spring**
**Electricity and Magnetism (3+0)**
Electrostatics, dielectrics, magnetostatics, magnetic materials, electromagnetism. Maxwell's equations, electromagnetic waves, radiation, physical optics and selected topics from electronics. (Prerequisites: Phys. 212 and Math. 202.)

**Phys. 351 3 Credits Fall**
**Introduction to Meteorology (3+0)**
A mathematical treatment of atmospheric thermodynamics and basic equations of motion. The principles of thermodynamics are applied to the atmospheric system in the theoretical considerations as well as in practical applications. (Prerequisites: Math. 201, Math. 202 taken concurrently. Offered as demand warrants.)

**Phys. 381 2 Credits Fall**
**Phys. 382 2 Credits Spring**
**Physics Laboratory (0+6)**
Laboratory experiments in classical and modern physics (Prerequisite: permission of the instructor. Offered in alternate years. Next offered 1974-75.)

**Phys. 393 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Phys. 394 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Phys. 397 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Phys. 411 4 Credits Fall**
**Phys. 412 4 Credits Spring**
**Modern Physics (4+0)**
Relativity, elementary particles, quantum theory, atomic and molecular physics, x-rays, and nuclear physics. (Prerequisites: Phys. 212 and Math. 302 or permission of the instructor. Offered in alternate years. Next offered 1975-76.)

**Phys. 445 3 Credits Spring**
**Solid State Physics and Physical Electronics (3+0)**
Theory of matter in the solid state and the interaction of matter with particles and waves. (Prerequisites: Phys. 212, Math. 302 and Math. 314; or permission of the instructor. Offered in alternate years. Next offered 1975.)

**Phys. 465 3 Credits Fall-Spring**
**Meteorology (3+0)**
Instruments and observations. Introduction to mechanics and thermodynamics of the atmosphere. Weather analysis and forecasting. (Prerequisites: Phys. 104, 106 or 212; Math. 202. Offered as demand warrants.)

**Phys. 481 2 Credits Fall**
**Phys. 482 2 Credits Spring**
**Advanced Physics Laboratory**
Advanced laboratory experiments in classical and modern physics. (Prerequisite: permission of instructor. Offered in alternate years. Next offered 1974-75.)

**Phys. 492 Credits Arr. Fall-Spring**
**Physics Seminar**
Seminar courses in various topics selected according to needs and interests of students. Primarily for physics majors. (Prerequisite: Permission of the instructor.)

**Phys. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offereed only once during an academic year.

**Phys. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Phys. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Phys. 603 3 Credits Fall**
**Phys. 604 3 Credits Spring**
**Introduction to Geophysics (3+0)**
**(Same as Geol. 603)**
A survey of selected topics in the planetary sciences, including introductory material in each of the major research subject areas in geophysics. 603 covers earth science and 604 covers atmospheric and space science. (Offered as demand warrants.)

**Phys. 611 3 Credits Fall**
**Phys. 612 3 Credits Spring**
**Mathematical Physics (3+0)**
**(Same as Math. 611-612)**
Advanced consideration of such topics as transform methods, asymptotic methods, Green's function, Sturm-Liouville Theory, conformal mapping, and calculus of variations with applications to problems arising in physics. (Prerequisites: Math. 422 and permission of the instructor. Offered as demand warrants.)

**Phys. 620 3 Credits Fall**
**Introduction to Physical Oceanography (3+0)**
**(Same as OCN 620 and Geol. 620)**
Physical description of the sea, physical properties of sea water, methods and measurements, boundary processes, currents, tides and waves, regional oceanography. (Prerequisite: science or engineering degree, or permission of the instructor.)

**Phys. 621 3 Credits 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. Offered in alternate years. Next offered 1975.)

**Phys. 622 3 Credits Spring**
**Statistical Mechanics (3+0)**
Classical and quantum statistics of independent particles, ensemble theory, and applications. (Admission by arrangement. Offered in alternate years. Next offered 1976.)

**Phys. 626 3 Credits Spring**
**Magnetohydrodynamics and Plasma Physics (3+0)**
Fundamental equations of magnetohydro dynamics and magnetohydrodynamic waves. Invariants of the motion of a charged particle in a magnetic field. Dynamics of a plasma, plasma waves. (Admission by arrangement. Offered as demand warrants.)

**Phys. 627 3 Credits Fall-Spring**
**Plasma Physics (3+0)**
Wave propagation in hot, homogeneous plasmas; loss cone instabilities; advanced particle orbittheory; wave phenomena and instabilities in inhomogeneous plasmas with complex geometries including drift and flute modes; quasi-linear theory and plasma disturbance. (Offered as demand warrants. Admission by arrangement.)

**Phys. 631 3 Credits Fall**
**Phys. 632 3 Credits Spring**
**Electromagnetic Theory (3+0)**
Electrostatics, magnetostatics, Maxwell's equations, and potentials. Lorentz equations, field energy, gauge conditions, retarded potentials, waves, radiation, tensor formulations, and non-Maxwellian electrodynamics. (Admission by arrangement. Offered in alternate years.)

**Phys. 637 3 Credits Fall**
**Cloud Physics and Radiation (3+0)**
Definition of radiative fluxes; radiation balance equation; water vapor and latent heat transfer; cloud forms and features; condensation nuclei and growth of cloud drops; ice nuclei; formation and growth of ice crystals; snow, hail, and rain processes; electrification growth of thunderclouds; weather modification; effects of clouds on radiation; and low cloud cover climatology. (Admission by arrangement. Offered as demand warrants.)

**Phys. 642 3 Credits Fall-Spring**
**Radio Physics (3+0)**
Selected topics from ionospheric absorption, diffraction, and scattering of radio waves. (Admission by arrangement. Offered as demand warrants.)

**Phys. 643 3 Credits Fall-Spring**
**Physical Properties of Snow, Ice and Permafrost (3+0)**
Physical properties of snow, ice and permafrost developed from the principles of solid state physics. Special emphasis on ice in natural systems, e.g. sea ice, and review of current research literature. Topics include structure, bonding, freezing process, crystal growth, mechanical, thermal, optical and electrical properties of these materials.

**Phys. 651** 3 Credits Fall
**Phys. 652** 3 Credits Spring
**Quantum Mechanics (3+0)**
Schrodinger's equations, operator formalism, correspondence principle, central force problems, perturbation theory, quantum-statistic mechanics and applications of quantum mechanics to collision problems, radiation and spectroscopy. (Admission by arrangement. Offered in alternate years. Next offered 1974-75.)

**Phys. 657** 3 Credits Fall
**Phys. 658** 3 Credits Spring
**Seismology (3+0)**
**(Same as Geol. 657, 658)**
Propagation of elastic waves in layered media. (Admission by arrangement. Offered as demand warrants.)

**Phys. 660** 3 Credits Fall-Spring
**Theoretical Geophysics (3+0)**
**(Same as Geol. 660)**
Selected topics in theoretical geophysics, mainly in solid earth physics, seismology, and geomagnetism. (Admission by arrangement. Offered as demand warrants.)

**Phys. 661** 3 Credits Fall-Spring
**The Upper Atmosphere (3+0)**
Those fundamentals of electrodynamics and atomic and molecular physics which are especially pertinent to the upper atmosphere: physical aeronomy; chemical aeronomy; optical phenomena; electric current systems; ion kinetics and distribution; thermal structure; disturbances within the ionosphere; electromagnetic wave propagation in the upper atmosphere; experimental diagnostic techniques. (Admission by arrangement. Offered as demand warrants.)

**Phys. 664** 2 Credits Fall-Spring
**Geomagnetic Disturbance and the Aurora (2+0)**
The morphology, statistics, solar and ionospheric associations of magnetic disturbances; indices of disturbance; auroral phenomena; theories of magnetic disturbance and the aurora. (Admission by arrangement. Offered as demand warrants.)

**Phys. 665** 3 Credits Fall-Spring
**Advanced Meteorology (3+0)**
Atmospheric statics, thermodynamics, radiation, and dynamics; atmospheric turbulence; general circulation; perturbation theory. (Admission by arrangement. Offered as demand warrants.)

**Phys. 667** 3 Credits Fall-Spring
**Theoretical Astrophysics (3+0)**
Radiative transfer and stellar hydrodynamics; theory of continuous and line spectrum from stellar atmospheres; solar photosphere, chromosphere and corona. (Admission by arrangement. Offered as demand warrants.)

**Phys. 671** 2 Credits Fall-Spring
**Space Physics (2+0)**
The sun and interplanetary space, the formation of the magnetosphere, energetic particles, plasma, and electromagnetic waves in the magnetosphere, solar storms and their extension into interplanetary space, magnetospheric storms.

**Phys. 674** 3 Credits As demand warrants
**Environmental Hydrodynamics (3+0)**
**(Same as OCN 674 and C.E. 674)**
Mechanics of fluids on a rotating earth. Navier Stoke's equations, boundary layer phenomena, turbulent flow, and applications of hydrodynamics to motion of stratified fluids such as the atmosphere and ocean.

**Phys. 675** 3 Credits Fall-Spring
**Radio Astronomy (3+0)**
Survey of instruments and techniques, radio wave generation and propagation in ionized media, solar radio waves, cosmic radio waves, effects of the troposphere on extra-terrestrial radio waves, radar astronomy. (Admission by arrangement. Offered as demand warrants.)

**Phys. 677** Credits Arr. Fall
**Phys. 678** Credits Arr. Spring
**Atomic and Molecular Processes**
Selected topics in collision theory, radiation theory, atomic and molecular structure and reactions, and experimental techniques of atomic and molecular physics. (Admission by arrangement. Offered as demand warrants.)

**Phys. 690** 0 Credits Fall-Spring
**Colloquium**

**Phys. 692** Credits Arr. Fall-Spring
**Seminar**
Various topics. (Admission by arrangement.)

**Phys. 693** Credits Arr. As demand warrants
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Phys. 694** Credits Arr. As demand warrants
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Phys. 697** Credits Arr. As demand warrants
**Individual Study**
(Admission by arrangement.)

**Phys. 699** Credits Arr. Spring
**Thesis or Dissertation**

## POLICE ADMINISTRATION

**P.A. 110 3 Credits Fall**
**Introduction to Criminal Justice (3+0)**
A study of the agencies and processes involved in the criminal justice system — the legislature, the police, the prosecutor, the courts and corrections. An analysis of the role and the problems of law enforcement in a democratic society.

**P.A. 150 3 Credits Fall-Spring**
**Police Administration (3+0)**
Principles of police administration and organization as applied to staff and line units. An analysis of their functions and activities, including record keeping, report writing, and the application of the computer. Offered in alternate years.

**P.A. 151-C 3 Credits Fall-Spring**
**Introduction to Criminology**
**(Correspondence Study Only)**
Study of the major areas of deviant behavior and relationship to society, law and law enforcement.

**P.A. 156-C 3 Credits Fall-Spring**
**Patrol Procedures**
**(Correspondence Study Only)**
Responsibilities, techniques, and methods of police work; computer orientation.

**P.A. 159-C 3 Credits Fall-Spring**
**Organization, Management & Administration**
**(Correspondence Study Only)**
An integrated study of the composition and functions of organizations, principles and problems of management and supervision; the role of administrator, including report writing.

**P.A. 251 3 Credits Fall-Spring**
**Criminology (3+0)**
The study of the major areas of deviant behavior and its relationship to society, law, and law enforcement, including the theories of crime causation. (Prerequisite: Soc. 101.)

**P.A. 252 3 Credits Fall**
**Criminal Law (3+0)**
A study of the elements, purposes, and functions of the substantive criminal law; with emphasis upon historical and philosophical concepts.

**P.A. 254 3 Credits Spring**
**Procedural Law**
**(Criminal Procedure) (3+0)**
Emphasis upon the legal limitations of the police and the right of the people to be secure from the government under the protections of the Constitution and the Rules of Evidence.

**P.A. 255 3 Credits Fall-Spring**
**Criminal Investigation (3+0)**
Fundamentals of investigation; crime scene search and recording; collection and preservation of physical evidence; scientific aids; modus operandi; sources of information; interviews and interrogation; follow-up and case preparation. (Offered in alternate years.)

**P.A. 257 3 Credits Fall-Spring**
**Traffic Safety (3+0)**
A study of traffic hazards and theoretical and practical aspects of traffic safety programs such as vehicle and highway design, regulation and control, education and enforcement. (Offered in alternate years.)

**P.A. 258 3 Credits Fall-Spring**
**Juveniles and the Law (3+0)**
The role of agencies under the law in regard to the juvenile, with special attention to the role of law enforcement. Both theoretical and practical aspects will be studied. (Offered in alternate years.)

**P.A. 259 3 Credits Fall-Spring**
**Administrative Concepts (3+0)**
Exposition of basic theory; principles and practices of public administration, especially as it applies to municipal agencies. Theoretical aspects of factors such as policy-formation and decision-making in a public agency. (Offered in alternate years.)

## POLITICAL SCIENCE

**P.S. 101 3 Credits Fall**
**P.S. 102 3 Credits Spring**
**Introduction to American Government and Politics (3+0)**
Survey of American government, political processes, and contemporary issues, focusing on national institutions. Distribution and uses of power and the role of political values and beliefs. The constitution and federalism; interest groups, parties, and elections; Congress, the Executive, and the courts.

**P.S. 201 3 Credits Fall**
**Comparative Politics: Methods of Political Analysis (3+0)**
Modern methods of analyzing political behavior and processes on a cross-national basis; emphasis is placed on the roles of executive, legislative and judicial systems, political parties and pressure groups, and current concepts of political development. Special application is made to three democratic European countries.

**P.S. 202 3 Credits Spring**
**Comparative Politics: Contemporary Doctrines and Structures (3+0)**
Conflicting approaches to the solution of social and

political problems are reviewed with particular emphasis on nations employing various forms of communism, socialism, Fascism, or contemporary concepts of "tutelary" or "controlled" democracy.

**P.S. 211 3 Credits Fall-Spring**
**State and Local Government (3+0)**
Organization and politics of state and local government in the United States; the Alaska constitution; problems of statehood in Alaska. (Prerequisite: P.S. 101.)

**P.S. 263 3 Credits Fall**
**Alaska Native Politics (3+0)**
An introduction to the political development, organization, interests and activities of Alaska Natives; treatment of the history of white-Native contact, the evolution of Native leadership, village and regional government, and the role of Native brotherhoods culminating in the Alaska Federation of Natives.

**P.S. 301 3 Credits Fall-Spring**
**Public Administration in the Political Process (3+0)**
Techniques and problems of administering public policy. The changing role of the executive branch in the political process. (Prerequisite: P.S. 101.)

**P.S. 315 3 Credits Fall**
**The American Political Tradition (3+0)**
The origin, nature and development of basic ideas that constitute the mainstream of the American political tradition. Debates of the constitutional Convention; nature of the Union; the Progressive movement. Present trends in American political thought. Effects on legislative and judicial decisions. (Prerequisites: History 131-132 strongly recommended.)

**P.S. 321 3 Credits Fall**
**P.S. 322 3 Credits Spring**
**International Politics (3+0)**
Introduction to the international political process; an appraisal of the nation-state, the evolution of the international system, and the dynamics of foreign policy formation; a survey of international relations theory, including classical, geopolitical and behavioral approaches. Second semester continuation with special attention to international law and organization, international political integration, and arms control and disarmament.

**P.S. 342 3 Credits Fall-Spring**
**Contemporary China and Its Neighbors (3+0)**
Historical perspective; communism's rise to power; sino-soviet and sino-Japanese relations, the cultural revolution, significance of Maoism; a case study in comparative political analysis.

**P.S. 401 3 Credits Fall**
**P.S. 402 3 Credits Spring**
**Political Behavior (3+0)**
Behavior of political organizations, parties, groups, politicians and individual citizens. (Prerequisites: P.S. 101-102.)

**P.S. 411 3 Credits Fall**
**P.S. 412 3 Credits Spring**
**Political Theory (3+0)**
Ancient, classical, medieval and modern political concepts, and their effects on political behavior.

**P.S. 415 3 Credits Fall-Spring**
**Recent Political Thought (3+0)**
A discussion of the contributions of modern thinkers to political theory.

**P.S. 435 3 Credits Fall**
**Introduction to Constitutional Law (3+0)**
Growth and development of the United States Constitution as reflected in decisions of the Supreme Court. Federal system; executive, legislative and judicial powers; nature of the judicial process; regulation of commerce, taxation. (Prerequisite: P.S. 101.)

**P.S. 436 3 Credits Spring**
**The Courts and Civil Liberties (3+0)**
Origin and development of civil and political liberties; responsibility of the branches of government and the people for their maintenance. Cases and literature bearing on protection of constitutionally guaranteed rights with particular reference to the period since 1937. (Prerequisites: P.S. 101.)

**P.S. 475 3 Credits Fall-Spring**
**Internship in Public Affairs (3+0)**
Designed to give carefully selected undergraduates and/or graduates the opportunity to do practical and meaningful work with governmental agencies or civic action groups. Admission by permission of the instructor.

**P.S. 492 Credits Arr. Fall-Spring**
**Seminar**

**P.S. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**P.S. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**P.S. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

## PSYCHOLOGY

**Psy. 101 3 Credits Fall-Spring**
**Introduction to Psychology (3+0)**
Fundamentals of general psychology. Human behavior: genetic, motivation, learning sensations, perception, personality.

**Psy. 201 3 Credits Fall**
**Advanced General Psychology (3+0)**
The theory and methods of psychology including the scope and limitations of the science. Major emphasis in the areas of experimental, statistical, physiological, clinical, and social analysis of behavior. (Prerequisite: Psy. 101.)

**Psy. 210 1 Credit As demand warrants**
**Advanced Group Experience Laboratory (0+2)**
Designed for individuals with previous group laboratory experience. An experiential and didactic approach to the resolution of personal and educational concern with emphasis on the techniques of psychodrama, Gestalt therapy and group encounter. Responsibility for behavior, patterns of interpersonal communication, and awareness of feelings will be explored.

**Psy. 244 3 Credits Spring**
**Early Childhood Development (2+3)**
Introduction to the physical, social, affective and cognitive development of young children from birth to six years of age. (Prerequisite: Psy. 101.)

**Psy. 245 3 Credits Fall-Spring**
**Child Development (2+3)**
**(Same as H.E. 245)**
Theory and laboratory of human mental emotional, social, and physical development. (Prerequisites: Psy. 101, 45 semester hours, and permission of the instructor.)

**Psy. 246 3 Credits Fall-Spring**
**Adolescence (2+3)**
**(Same as Soc. 246)**
Intellectual, emotional, social and physical development patterns during the adolescent years. Laboratory arranged for observations of adolescents in a variety of settings, including public schools. (Prerequisites: Psy. 201, 45 semester hours, and permission of the instructor. Soc. 101 is recommended.)

**Psy. 251 3 Credits Fall-Spring**
**Introductory Statistics for Behavioral Sciences (3+0)**
**(Same as Soc. 251)**
Introduction to the purposes and procedures of statistics; calculating methods for the description of groups (datareduction) and for simple inferences about groups and differences between group means. (Prerequisite: Psy. 201.)

**Psy. 261 3 Credits Fall**
**Introduction to Experimental Psychology (2+3)**
Introduction to and laboratory application of the experimental methods to some problems of psychology using both human and animal subjects. (Prerequisite: Psy. 201, 251. Psy. 251 and 261 may be taken concurrently.)

**Psy. 301 3 Credits Fall**
**History and Systems of Psychology (3+0)**
Development of psychological thought with an emphasis on experimental and theoretical areas from the early Greeks to the present. (Prerequisite: Psy. 201.)

**Psy. 302 3 Credits Spring**
**Social Psychology (3+0)**
**(Same as Soc. 302)**
An analysis of inter-group relationships in terms of process and value orientation, their influences on the personality, and the various aspects of collective behavior on group and person. (Prerequisites: Psy. 201, Soc. 101-102.)

**Psy. 331 3 Credits Fall**
**Industrial Psychology (3+0)**
Job and worker analysis, selection, training, fatigue, worker adjustment, morale, labor-management relations. (Prerequisite: Psy. 201.)

**Psy. 338 3 Credits Spring**
**Abnormal Psychology (3+0)**
Abnormalities of human behavior. (Prerequisites: Psy. 201.)

**Psy. 362 3 Credits Spring**
**Intermediate Experimental Psychology (2+3)**
Training in the design, instrumentation, and execution of experiments with human and animal subjects. Major emphasis in the areas of learning, motivation, and perception. (Prerequisites: Psy. 201, 261.)

**Psy. 373 3 Credits Fall**
**Psychological Testing (3+0)**
Standardized psychological tests in various applied areas; administration, scoring, and interpretation of established tests. (Prerequisites: Psy. 201, 251, 261.)

**Psy. 406 3 Credits Spring**
**Theories of Personality (3+0)**
Current psychological theories, with a critical examination of the different approaches used in theory construction. (Prerequisites: Psy. 201, 338.)

**Psy. 407 3 Credits Fall**
**Motivation (3+0)**
Survey of theory and research on reinforcement,

punishment, frustration, preference, instinctual mechanisms, and other factors "controlling" the performance of organisms. (Prerequisites: Psy. 201, 261. Offered alternate years. Next in 1974.)

**Psy. 433 3 Credits Spring**
**Clinical Psychology (3+0)**
Elementary course in methods of clinical psychology with consideration of psychological assessment and psychological approaches to treatment. (Prerequisite: Psy. 201. Offered alternate years. Next offered 1975.)

**Psy. 464 3 Credits Spring**
**Learning (3+0)**
A study of the major theories of conditioning and learning, and a survey of current literature concerning classical conditioning and instrumental learning in humans and animals. (Prerequisites: Psy. 201, 261.)

**Psy. 465 3 Credits Fall**
**Comparative and Physiological Psychology (3+0)**
An introduction to physiological, chemical, and neutral principles basic to human and animal behavior. Review of current literature in the field. (Prerequisites: Psy. 201, 261. It is recommended that Biol. 107-108 be taken prior to Psy. 465. Offered alternate years. Next offered 1974.)

**Psy. 466 3 Credits Spring**
**Perception (3+0)**
Current literature and theoretical models of perception emphasizing the physiological, developmental, and social effects on interpretation of sensory processes. (Prerequisites: Psy. 201, 261. Offered alternate years. Next offered 1975.)

**Psy. 473 3 Credits Fall**
**Social Science Research Methods (3+0)**
**(Same as Soc. 473)**
Techniques of social research; sampling, questionnaire construction, interviewing and data analysis in surveys; field and laboratory experiments; attitude scaling. (Prerequisites: Psy. 251 and prerequisites thereto.)

**Psy. 492 2 Credits As demand warrants**
**Seminar in Human Behavior (2+0)**
**(Same as Soc. 492)**
Integrated behavioral approach emphasizing the major sociological and psychological theories with special attention to current literature. (Prerequisite: Senior standing in psychology or sociology.)

**Psy. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Psy. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Psy. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**Psy. 623 3 Credits As demand warrants**
**Principles of Individual Counseling (3+0)**
**(Same as Ed. 623)**
Counseling techniques and procedures in education, social work, and on a limited basis, clinical psychology; their applications by the classroom teacher and a guidance specialist in assisting students with adjustment problems within a normal range. (Prerequisites: Ed. 426, Psy. 338 or 406 and permission of the instructor.)

**Psy. 624 3 Credits As demand warrants**
**Group Counseling (3+0)**
**(Same as Ed. 624)**
Kinds and types of groups with emphasis on methods, problems and needed skills in working with groups in a counseling situation. (Prerequisites: Ed. 426, 623.)

**Psy. 628 3 Credits As demand warrants**
**Analysis of the Individual (3+0)**
**(Same as Ed. 628)**
Means of acquiring data pertinent to the individual. Interpreting data and formulating case reports conducive to greater understanding. (Prerequisite: Ed. 426.)

**Psy. 629 3 Credits As demand warrants**
**Individual Tests of Intelligence (3+0)**
**(Same as Ed. 629)**
Individual intelligence tests with emphasis on the Revised Stanford-Binet Intelligence Scale and the Wechsler Intelligence Scales. (Prerequisites: Ed. 332 and permission of the instructor.)

**Psy. 630 3 Credits As demand warrants**
**Laboratory in Individual Tests of Intelligence (0+9)**
**(Same as Ed. 630)**
Provides laboratory experience in administration of the Revised Stanford-Binet Intelligence Scale or the Wechsler Intelligence Scales. (Prerequisites: Ed. 629 and permission of the instructor.)

**Psy. 632 3 Credits As demand warrants**
**Occupational Information (3+0)**
**(Same as Ed. 632)**
Principles and practices of vocational guidance. Explains process of choosing a vocation, theories of vocational choice, sources and dissemination of occupational information. (Prerequisites: graduate standing, Ed. 426, and permission of the instructor.)

**Psy. 634** **1-3 Credits** **Arranged**
**Counseling Practicum**
**(Same as Ed. 634)**
Provides supervised field experience, including preparatory activites in an educational and agency setting. (Prerequisite: Approval of instructor. May be repeated for a maximum of 6 credits.)

**Psy. 699** **Credits Arr.** **Fall-Spring**
**Thesis**

## RUSSIAN

**Russ. 101** **5 Credits** **Fall**
**Russ. 102** **5 Credits** **Spring**
**Elementary Russian (5+0)**
Development of the four skills (listening comprehension, speaking, reading, and writing) with emphasis on oral work, practice in the language laboratory, basic grammar, and vocabulary.

**Russ. 111** **3 Credits** **Fall**
**Russ. 112** **3 Credits** **Spring**
**Russian for Reading Ability (3+0)**
Rapid acquisition of reading knowledge with attention to needs in specialized fields. Credit applicable to degrees requiring one year of a foreign language with emphasis on reading skill. (Offered as demand warrants.)

**Russ. 201** **4 Credits** **Fall**
**Russ. 202** **4 Credits** **Spring**
**Intermediate Russian (4+0)**
Continuation of Russ. 102. Increasing emphasis on reading ability and cultural materials. Conducted in Russian. (Prerequisite: Russ. 102 or two years of high school Russian.)

**Russ. 301** **3 Credits** **Fall**
**Russ. 302** **3 Credits** **Spring**
**Advanced Russian (3+0)**
Discussions and essays on more difficult subjects or texts; translations, stylistic exercises, special grammatical problems; systematic vocabulary building. Conducted in Russian. (Prerequisite: Russ. 202 or instructor's permission. Next offered 1975-76.)

**Russ. 321** **3 Credits** **Fall**
**Russ. 322** **3 Credits** **Spring**
**Studies in Russian Literature (3+0)**
Choice of authors, genres, or periods of Russian literature for intensive study. Conducted in Russian. (Prerequisite: Russ. 202 or equivalent. Students may repeat course for credit when topic varies. (Offered as demand warrants.)

**Russ. 351** **3 Credits** **Fall**
**The Russian Novel (3+0)**
The Russian novel of the nineteenth and twentieth centuries. Study of novels by Pushkin, Lermontov, Gogol, Turgenev, Dostoevsky and Solzhenitsyn. A lecture course conducted in Russian. (Prerequisite: Russ. 202 or equivalent. Next offered 1974-75.)

**Russ. 362** **3 or 4 Credits** **Spring**
**Russian Drama in English Translation**
**(3+0)**
A survey of Russian drama from its origin in folk tradition up to and including plays of the Soviet period. Emphasis will be on dramatists of the 18th, 19th and 20th centuries. Lectures and readings will be in English. For Russian majors and/or interested students with a knowledge of Russian, an extra unit of credit will be offered. Students will be required to read plays in Russian. Weekly meetings will be scheduled to discuss (in Russian) the linguistic and stylistic aspects of the plays covered in the lectures. (Prerequisites: Russ. 202 or equivalent. Next offered 1974-75.)

**Russ. 493** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Russ. 494** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Russ. 497** **Credits Arr.** **As demand warrants**
**Individual Study**
(Admission by arrangement.)

## SOCIOLOGY

**Soc. 101** **3 Credits** **Fall-Spring**
**Introduction to Sociology (3+0)**
An introduction to the science of man as a social animal, emphasizing the social processes which give rise to and shape man's language, experiences, perception, meaning and behavior. An attempt is made to construct an interaction framework to be used in understanding and predicting human behavior.

**Soc. 102** **3 Credits** **Fall-Spring**
**Introduction to Sociology (3+0)**
A continuation of Soc. 101. (Prerequisite: Soc. 101.)

**Soc. 106** **3 Credits** **Fall-Summer**
**Social Welfare (3+0)**
Functions and development of modern social welfare and the distinctive features of the field, designed primarily to assist in the understanding of social welfare problems and services. (Prerequisite: Soc. 101.)

**Soc. 201 3 Credits Fall**
**Social Problems (3+0)**
Problems of contemporary society; analysis of factors giving rise to them. (Prerequisites: Soc. 101, 102.)

**Soc. 205 3 Credits Fall**
**Group Processes in Modern Society (3+0)**
Formation, structure and functioning of groups; group processes and group products; implications of various research techniques. (Prerequisites: Soc. 101, 102.)

**Soc. 207 3 Credits Fall**
**Population and Ecology (3+0)**
Analysis of world populations, growth and decline patterns, migratory trends, and ecology. Critical review of major theoretical contributions with introduction to demographic methods. (Prerequisites: Soc. 101 or permission of instructor.)

**Soc. 212 3 Credits Fall**
**Black Americans in Contemporary Society (3+0)**
An examination and analysis of the black subculture in the United States with special attention to: the historical overview, theoretical applications, and consideration of alternatives.

**Soc. 242 3 Credits Spring**
**The Family (3+0)**
A study of the contemporary patterns of marriage and family relationships in the U.S.A. Social psychological approach to factors associated with the life cycle of the family, including mate selection, marital interaction and adjustment, parent-child relationships, and the later years of married life. (Prerequisites: Soc. 101, 102.)

**Soc. 246 3 Credits Fall-Spring**
**Adolescence (2+3)**
**(Same as Psy. 246)**
Intellectual, emotional, social and physical development patterns during the adolescent years. Laboratory arranged for observations of adolescents in a variety of settings, including public schools. (Prerequisites: Psy. 201, 45 semester hours, and permission of the instructor. Soc. 101 is recommended prior to Soc. 246.)

**Soc. 251 3 Credits Fall-Spring**
**Introductory Statistics for Behavioral Sciences (3+0)**
**(Same as Psy. 251)**
Introduction to the purposes and procedures of statistics; calculating methods for the description of groups (data reduction) and for simple inferences about groups and differences between group means. (Prerequisite: Soc. 101.)

**Soc. 302 3 Credits Spring**
**Social Psychology (3+0)**
**(Same as Psy. 302)**
An analysis of inter-group relationships in terms of process and value orientation, their influences on the personality, and the various aspects of collective behavior on group and person. (Prerequisites: Psy. 201 or Soc. 101, 102.)

**Soc. 304 3 Credits Spring**
**Culture and Personality (3+0)**
An examination of cultural value systems and social institutions as they bear on the formation of personality. Types of behavior patterns relevant to personality formation. (Prerequisites: Soc. 101, 102.)

**Soc. 307 3 Credits Fall**
**Population Problems (3+0)**
The demographic structure of population and its implications. (Prerequisite: Soc. 101.)

**Soc. 309 3 Credits Fall**
**Urban Sociology (3+0)**
Growth and development of urban communities with reference to migration patterns, differentiation of functions, ecological patterns of land use, social control, secondary group associations of metropolitan magnitude. (Prerequisites: Soc. 101, 102.)

**Soc. 310 3 Credits Spring**
**Sociology of Later Life (3+0)**
A comparative analysis of the social status and role of the aging in various societies with emphasis on problems of aging in contemporary U.S. (Prerequisites: Soc. 101, 102. Offered in alternate years; next offered 1975.)

**Soc. 333 3 Credits Fall**
**Social Welfare as a Social Institution (3+0)**
Historical development and survey of social services and social work practice as these affect human needs: economic security, child welfare, family service programs, health agencies, correctional agencies, community organization programs. (Prerequisites: Soc. 101, 102, 201.)

**Soc. 336 3 Credits Spring**
**Social Work Methods (3+0)**
The scope and principles of modern social work. Description of the three major methods of social work; casework, group work, and community organization. Preparation for further study in the field and for preliminary work in it. (Prerequisites: Psy. 101, Soc. 333, or permission of the instructor.)

**Soc. 343 3 Credits Fall**
**Sociology of Deviant Behavior (3+0)**
A study of the social etiology of deviant behavior, both criminal and noncriminal with an emphasis on the nature of group interaction, and an examination of the institutions involved. (Prerequisites: Soc. 101, 102.)

**Soc. 345** **3 Credits** **Fall**
**Sociology of Education (3+0)**
**(Same as Ed. 345)**
Impact of culture on schools. Examination of contemporary social trends and relationships among church, school, government, and family. (Prerequisite: Soc. 101.)

**Soc. 347** **3 Credits** **Fall**
**Sociology of Religion (3+0)**
The study of the historical development and functional significance of religion, values, and norms of institutions, groups and reform movements and their influence on social organization. (Prerequisites: Soc. 101, 102. Offered alternate years; next offered 1974.)

**Soc. 363** **3 Credits** **Fall**
**Social Stratification (3+0)**
The study of the differential distribution of social power, privilege and life chances in class and caste as the basis for social organization. Emphasis on occupational, educational and other correlates which determine social structure. (Prerequisites: Soc. 101, 102.)

**Soc. 383** **3 Credits** **Fall-Spring**
**Field Observation (To be Arranged)**
Introduction to the services of community agencies to provide a better understanding of the role and programs of social agencies and their services. It is designed to assess the students' interest in and motivation for a career in the social services. The serious student can obtain credit for two semesters' work in this course. Four to six hours a week in approved social agencies. (Prerequisites: Soc. 336 or concurrently with Soc. 336 and permission of the instructor.)

**Soc. 402** **3 Credits** **Spring**
**Theories of Sociology (3+0)**
Major sociological theories and theorists of Western civilization; review of important contributions and approaches of various "national schools" with emphasis on current American and European trends. (Prerequisite: Psy. 302 or Soc. 302.)

**Soc. 405** **3 Credits** **Fall**
**Social Change (3+0)**
Social change in long-time perspective, with emphasis on social movements and the influence of technology. (Prerequisites: Soc. 101, 102.)

**Soc. 406** **3 Credits** **Spring**
**Human Ecology (3+0)**
Modern industrial and centralized society; institutional structure of community life — political, economic, religious — with reference to internal structure and external sources of control and domination, with some emphasis on the nature of ruralism. (Prerequisites: Soc. 101, 102. Offered alternate years; next offered 1975.)

**Soc. 407** **3 Credits** **Spring**
**Formal Organizations (3+0)**
Theory and analysis of large-scale, complex, modern organizations, their coordination, role and status interrelationships, and their publics. (Prerequisite: Soc. 101.)

**Soc. 408** **3 Credits** **Spring**
**American Minority Groups (3+0)**
Present status of ethnic, religious and national minorities and their changing sociological, economic, and political status.

**Soc. 473** **3 Credits** **Fall**
**Social Science Research Methods (3+0)**
**(Same as Psy. 473)**
Techniques of social research; sampling, questionnaire construction, interviewing and data analysis in surveys; field and laboratory experiments; attitude scaling. (Prerequisite: Psy. 251 or Soc. 251.)

**Soc. 492** **2 Credits** **Spring**
**Seminar in Human Behavior (2+0)**
Integrated behavioral approach emphasizing the major sociological and psychological theories with special attention to current literature. (Prerequisite: Senior standing in psychology or sociology.)

**Soc. 493** **Credits Arr.** **As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Soc. 494** **Credits Arr.** **As demand warrants**

**Special Topics**
Special topics course approved to be offered on a trial basis.

**Soc. 497** **Credits Arr.** **As demand warrants**
**Individual Study**
(Admission by arrangement.)

## SPANISH

**Span. 101** **5 Credits** **Fall**
**Span. 102** **5 Credits** **Spring**
**Elementary Spanish (5+0)**
Development of the four skills (listening comprehension, speaking, reading, and writing) with emphasis on oral work, practice in the language laboratory, basic grammar, and vocabulary.

**Span. 201** **4 Credits** **Fall**
**Span. 202** **4 Credits** **Spring**
**Intermediate Spanish (4+0)**
Continuation of Span. 102. Increasing emphasis on reading ability and cultural material. Conducted in Spanish. (Prerequisite: Span. 102 or two years of high school Spanish.)

**Span. 301** 3 Credits Fall
**Span. 302** 3 Credits Spring
**Advanced Spanish (3+0)**
Discussions and essays on more difficult subjects or texts, translations, stylistic exercises, special grammatical problems, systematic vocabulary building. Conducted in Spanish. (Prerequisite: Span. 202 or equivalent. Next offered 1974-75.)

**Span. 313** 3 Credits Fall
**Span. 314** 3 Credits Spring
**Spanish Civilization (3+0)**
History, development of the arts and of national institutions; extensive reading and classroom discussion. Conducted in Spanish. (Prerequisite: Span. 202. Next offered 1975-76.)

**Span. 321** 3 Credits Fall
**Span. 322** 3 Credits Spring
**Studies in Spanish Literature (3+0)**
Choice of authors, genres, or periods of Spanish literature for intensive study. Conducted in Spanish. Students may repeat course for credit when topic varies. (Prerequisite: Span. 202 or equivalent. Next offered 1976-77.)

**Span. 437** 3 Credits Fall
**Literature of the Golden Age (3+0)**
Close study of outstanding literary works in different genres. Conducted in Spanish. (Offered as demand warrants.)

**Span. 447** 3 Credits Fall
**20th Century Literature (3+0)**
Analysis primarily of the post-war novel and poetry. (Offered as demand warrants.)

**Span. 448** 3 Credits Spring
**Spanish American Literature (3+0)**
Critical reading of selected literary works and introduction to major literary movements in Spanish (Offered as demand warrants.)

**Span. 493** Credits Arr. As demand warrants
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Span. 494** Credits Arr. As demand warrants
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Span. 497** Credits Arr. As demand warrants
**Individual Study**
(Admission by arrangeeement.)

## SPEECH COMMUNCATION

**Sp.C. 51** 2 Credits Fall-Spring
**Sp.C. 52** 2 Credits Fall-Spring
**Basic Speech Communication Skills (2+0)**
Development of ease and fluency in oral discourse.

**Sp.C. 111** 3 Credits Fall-Spring
**Fundamentals of Oral Communication (3+0)**
An introduction to the processes of interpersonal and group communication patterns, focusing on the affective elements of language and culture.

**Sp.C. 201** 1 Credit Fall-Spring
**Debate Practicum (0+2)**
Training in practical debate situations. Participation in Debating Society required. May be repeated for a maximum of six credits. Students wishing to take this course and Sp.C. 351, Argumentation and Debate, may enroll in the latter with the consent of the instructor and may not receive more than eight units of credit for any combination of the two courses.

**Sp.C. 211** 2 Credits Fall
**Voice and Diction (1+2)**
Development of fluency and clearness in the voice; study and practice to improve speech and eliminate faults of articulation and pronunciation; phrasing, inflection, and emphasis, including individual analysis and tape recordings. (Prerequisite: Sp.C. 111 or admission by arrangement.)

**Sp.C. 235** 3 Credits Fall-Spring
**Discussion and Small Group Process (3+0)**
An approach to understanding the process of the small group; emphasizing self-evaluation, the role of conflict, the observation and diagnoses of group behavior, and the value of T-group training and the encounter group as an approach to learning.

**Sp.C. 241** 3 Credits Fall-Spring
**Public Speaking I (3+0)**
Theory and practice of exposition and persuasion and platform speaking situations.

**Sp.C. 311** 3 Credits Fall
**Introductory Phonetics (3+0)**
Use of International Phonetic Alphabet; broad transcription use in acting, teaching, speech improvement.

**Sp.C. 320** 3 Credits Fall-Spring
**General Semantics (3+0)**
A study of human interaction through communication processes.

**Sp.C. 325** 3 Credits Fall-Spring
**Communication Theory (3+0)**
Study of human communication as a system of

behavior, and as interaction within specific contexts. Focus is on the philosophical bases of communication theory, acquisition of communicative skills, intrapersonal processing, interaction, social influence and communication, and communication as culture.

**Sp.C. 341 3 Credits Fall**
**Persuasion (3+0)**
Theory of the persuasive process, focusing on the nature of attitude change, aspects of the source, the receiver and the persuasive message. Exploration of ethical questions, and of applied persuasion in contemporary society.

**Sp.C. 351 3 Credits Fall-Spring**
**Argumentation and Debate (3+0)**
Theory of argumentation and debate applied to contemporary issues. Practice in briefing and presenting arguments, testing evidence, and detecting fallacies.

**Sp.C. 361 3 Credits Fall-Spring**
**Oral Interpretation (2+2)**
Interpretative reading based on textual analysis of literary forms and careful study of principles of effective reading. (Prerequisite: Sp.C. 111 or admission by arrangement.)

**Sp.C. 371 3 Credits Fall-Spring**
**Speech for the Classroom Teacher (3+0)**
Speech development in the child. Common classroom speech disorders; articulation, delayed speech, stuttering. Classroom procedures in speech improvement.

**Sp.C. 411 3 Credits Spring**
**Advanced Phonetics (3+0)**
Use of International Phonetic Alphabet; narrow transcription and modifying signs; foreign language accents and dialects; speech distortions. (Prerequisite: Sp.C. 311.)

**Sp.C. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Sp.C. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Sp.C. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

## SPEECH PATHOLOGY

**Sp.P. 210 3 Credits Spring**
**Speech Processes (3+0)**
Five basic speech processes. Respiration, phonation, resonance, articulation, and audition. (Offered alternate years.)

**Sp.P. 211 3 Credits Fall-Spring**
**Fundamentals of Speech Correction I (3+0)**
Basic speech processes. Comprehensive study of four speech disorders; cleft palate, stuttering, hearing impairment, mental retardation (speech and language aspects).

**Sp.P. 212 3 Credits Fall-Spring**
**Fundamentals of Speech Correction II (3+0)**
Comprehensive study of four speech disorders: articulation, aphasia, cerebral palsy, autism (speech and language aspects).

**Sp.P. 231 3 Credits Fall-Spring**
**Audiology I (3+0)**
Structure, function and pathologies of the hearing mechanism. Contribution of hearing processes to communication. Assessment of hearing by pure-tone audiometry.

**Sp.P. 341 3 Credits Spring**
**Clinical Methods in Speech Correction (2+2)**
Administration of clinical tests of speech and application of principles of speech correction. (Prerequisites: Sp.C. 311, Sp.P. 211, or admission by arrangement.)

**Sp.P. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Sp.P. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Sp.P. 497 Credit ts Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

## THEATRE

**Thr. 101, 201 1-3 Credits Fall**
**Thr. 301, 401 Spring**
**Theater Practicum (0+var.)**
Participation in Drama Workshop or lab production as performer or technical staff member.

**Thr. 211 3 Credits Fall-Spring**
**Introduction to the Theater (3+0)**
History of theater with emphasis on dramatic form, architecture, and standards of criticism.

**Thr. 221 3 Credits Fall-Spring**
**Acting I (1+4)**
Principles of acting developed through pantomime, improvisation, and sense-memory. (Prerequisite: Thr. 211 or admission by arrangement.)

**Thr. 241 3 Credits Fall-Spring**
**Basic Stagecraft (1+4)**
Materials of scene construction and painting and their use.

**Thr. 321 3 Credits Fall-Spring**
**Acting II (1+4)**
Building a character; role study and performance of small scenes. (Prerequisites: Thr. 211, 221, or admission by arrangement.)

**Thr. 325 3 Credits Every Third Semester**
**Theatre Speech (2+2)**
Vocal techniques for actors. Standard stage diction and foreign dialects.

**Thr. 331 3 Credits Fall-Spring**
**Directing (1+4)**
Direction of short plays for drama lab productions. (Prerequisites: Thr. 211, 221, or admission by arrangement.)

**Thr. 341 3 Credits Fall-Spring**
**Intermediate Stagecraft (1+2)**
An examination of the less common scenic materials with methods and techniques for their use. Particular attention will be given to the use of dye in painting backgrounds and projection slides, vacuum formed plastics, molded polyurethane foam, etc.

**Thr. 343 3 Credits Fall-Spring**
**Scene Design (3+0)**
Principles and techniques of theatrical scene design. The student will design projects directed at solving particular scenic problems or working in a specific scenic style with specific physical limitations. (Prerequisite: Thr. 241 or permission of the instructor.)

**Thr. 347 3 Credits Fall-Spring**
**Lighting Design (3+0)**
Principles and techniques of theatrical lighting design. The student will conduct practical experiments and design projects applying the experience gained from the experiments. (Prerequisites: Thr. 241, 343, or permission of the instructor. May be taken concurrently with Thr. 343, as the material from one course may be applied to the other.)

**Thr. 351 3 Credits Fall-Spring**
**Makeup for Theater (1+4)**
Theatrical makeup for actors, teachers, directors, and other theater workers; makeup materials and use; straight and character makeup illusory and plastic relief; national types, influence of lighting. (Students will spend approximately $20.00 for materials. Offered as demand warrants.)

**Thr. 355 3 Credits Fall-Spring**
**History of Stage Costume (3+0)**
Stage costume and contemporary dress of the major theatrical periods. Emphasis will be placed on the process of selection of costumes for representative plays of each period.

**Thr. 435 3 Credits Spring**
**Directing (3+0)**
Directorial analysis of a major dramatic work for public presentation. (Prerequisite: Senior majors with 3.00 G.P.A. in speech.)

**Thr. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**Thr. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**Thr. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

## WILDLIFE AND FISHERIES

**W.F. 301 3 Credits Fall**
**Principles of Animal Population Dynamics and Management (2+2)**
Principles of animal population dynamics, especially in the single-species situation; principles of managing animal populations, including goals, approaches, ecological and socio-economic frameworks and major problems. Extension and application of basic ecologic principles to the manipulation of animal habitat and populations. (Prerequisites: Biol. 271 and L.R. 102.)

**W.F. 333 2 Credits Fall**
**Literature of Ecology and Resource Management (1+2)**
Standard and modern approaches to utilization of biological literature; introduction to information retrieval problems and techniques. Thorough acquaintance developed with periodical and other literature in student's special interest field.

**W.F. 401 2 Credits Spring**
**Wildlife Management Techniques (1+3)**
Methods of collecting raw data for a research project or for establishing a wildlife management plan. Standard techniques for determining sex, age, food habits, movements, reproductive history, physical condition, population size, and habitat status of common wildlife species. (Prerequisites: W.F. 301.)

**W.F. 402 2 Credits Fall-Spring**
**Wildlife Biology and Management (1+3)**
Intensive analysis of contemporary problems in wildlife management especially those dealing with mult-species interactions and complex soci -economic situations. (Prerequisites: W.F. 301, Biol. 476, A.S. 301.)

**W.F. 411 Credits Arr. Fall**
**Fisheries Field Trip**
A trip to acquaint students with some of the principal fisheries of the state and problems involved in their management. (Prerequisite: major in fisheries biology or admission by arrangement. Offered as demand warrants.)

**W.F. 417 2 Credits Fall-Spring**
**Wildlife Management—Forest and Tundra (2+0)**
Forest and tundra wildlife, with emphasis on game and fur species; correlation of wildlife management with forest aand tundra land use practices. (Admission by arrangement. Offered as demand warrants.)

**W.F. 419 2 Credits Fall-Spring**
**Wildlife Management—Wetlands (2+0)**
Wetland wildlife with emphasis on game and fur species of fresh-water areas; correlation of wildlife management with wetland use practices. (Admission by arrangement. Offered as demand warrants.)

**W.F. 423 3 Credits Fall**
**Limnology (2+3)**
Physical, chemical, and biological characteristics of fresh waters, emphasizing ecological aspects important to fish and other organisms. (Prerequisites: Chem. 106 and Biol. 271, or permission of the instructor.)

**W.F. 429 3 Credits Fall**
**General Fisheries Biology (2+3)**
The general biology of fishes in relation to their management. Methods of collecting, analyzing and interpreting field and laboratory data. (Prerequisites: Biol. 271, 222, 305 and A.S. 301.)

**W.R. 430 3 Credits Spring**
**Fisheries and Their Management (3+0)**
Major commercial and recreational fisheries of the world, with emphasis on the North Pacific. Biological, economic, and political considerations in the use and management of aquatic resources. Non-majors encouraged.

**W.F. 435 2 Credits Fall**
**Problems in Water Pollution Biol. (2+0)**
Effects of man-caused environmental stresses on the composition and dynamics of aquatic communities. Changes in diversity and matter and energy transfer. Biological indices. Water quality, standards and use classifications. (Prerequisites: Biol. 271, W.F. 423 or permission of the instructor; offered alternate years, next in 1973.)

**W.F. 436 2 Credits Spring**
**Advances in Aquaculture (2+0)**
An overview of the rapidly developing field of aquaculture including salmon, trout, and catfish hatcheries, and oyster and other shellfish farming. This will include the theory as well as some practice, and discussions of biological and economic problems. (Prerequisites: W.F. 429. Offered alternate years; next offered 1974.)

**W.F. 492 1 Credit Fall-Spring**
**Seminar (2+0)**
Various topics in wildlife and fisheries. (Prerequisite: Senior standing or admission by arrangement. Offered as demand warrants.)

**W.F. 493 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**W.F. 494 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**W.F. 497 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangement.)

**W.F. 611 Credits Arr. Fall**
**W.F. 612 Credits Arr. Spring**
**Wildlife Field Trip**
Trips to wildlife areas to acquaint students with principal animals of the state and problems involved in their management. (Admission by arrangement. Offered as demand warrants.)

**W.F. 621 3 Credits Fall**
**Vertebrate Population Dynamics (2+3)**
General theories of population control, emphasizing vertebrates. Laboratory work on the description and interpretation of the characteristics and dynamics of wild populations. (Prerequisite: Admission by arrangement; minimal preparation equivalent to Biol. 271, Math. 200, and A.S. 301. Offered as demand warrants, usually in alternate years.)

**W.F. 624 2 Credits Spring**
**Problems in Fisheries Management**
Selected readings and discussions relating to major fisheries of the world, their problems, and the methods of attack on these problems. (Admission by arrangement. Offered as demand warrants.)

**W.F. 625 3 Credits Fall**
**Fishery Ecology (2+3)**
The dynamics of aquatic systems, emphasizing community structure, energy flow, trophic relationships, and secondary and tertiary production. Applications to fish and invertebrate fisheries management. (Prerequisites: Geol. 411 or W.F. 423, and W.F. 429. Offered in alternate years; next offered 1973.)

**W.F. 627 3 Credits Fall**
**Invertebrate Fisheries Biology (2+3)**
The taxonomy, structure, physiology, and life histories of some commercially important marine shellfishes. Larval development, behavior, reproductive and feeding biology. Interrelationships of marine animals. (Prerequisite: Biol. 305; offered as demand warrants.)

**W.F. 628 3 Credits Spring**
**Fin-fish Fisheries Biology (2+3)**
The taxonomy, structure, and life history of some commercially important marine fishes. Distributions and seasonal movements; behavior and feeding biology. Techniques of aging and estimating stock size and productivity. (Prerequisites: Biol. 423 or permission of the instructor; offered as demand warrants.)

**W.F. 629 2 Credits Fall**
**Sampling in the Marine Environment (1+3)**
An evaluation of classical and current methods for sampling some biological and biologically related parameters (physical, chemical, geological) of marine systems. Demonstration and use of field and laboratory techniques. Problems in calibration and interpretation of data. (Prerequisite: Permission of the instructor. Offered in alternate years, next in 1974.)

**W.F. 692 1 Credit Fall-Spring**
**Seminar (2+0)**
Various topics in wildlife and fisheries; required of all graduate students. (Biol. 692 may be substituted by permission of the major professor. Offered as demand warrants.)

**W.F. 693 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered only once during an academic year.

**W.F. 694 Credits Arr. As demand warrants**
**Special Topics**
Special topics course approved to be offered on a trial basis.

**W.F. 697 Credits Arr. As demand warrants**
**Individual Study**
(Admission by arrangeement.)

**W.F. 698 Credits Arr. Fall-Spring**
**Research**
Investigative work, either field or laboratory, on a problem of lesser scope than the thesis, or supplementary to the thesis. (Admission by arrangement.)

**W.F. 699 Credits Arr. Fall-Spring**
**Thesis**
(Admission by arrangement.)

# Register

## THE BOARD OF REGENTS

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

**Robert E. McFarland,** President, Anchorage, 1963-1979

**Edith R. Bullock,** Vice President, Anchorage, 1967-75

**Vide G. Bartlett,** Secretary, Fairbanks, 1971-1979

**Hugh B. Fate, Jr.,** Treasurer, Fairbanks, 1969-1977

**A. D. Robertson,** Ketchikan, 1967-1975

**Brian J. Brundin,** Anchorage, 1969-1977

**Frank M. Doogan,** Juneau, 1973-1981

**Roy H. Madsen,** Kodiak, 1973-1981

**Ronald E. Wendte,** Juneau, 1974-1976

**Robert W. Hiatt,** President of the University, Ex-Officio Member

## THE PRESIDENT'S COUNCIL

**Robert W. Hiatt,** Ph.D., President

**Don M. Dafoe,** Ed.D., Executive Vice President

**Donald R Theophilus,** Ph.D., Vice President for Academic and Faculty Affairs

**Kenneth M. Rae,** Ph.D., Vice President for Research

**Max M. Hullinger,** B.S., Vice President for Finance and Comptroller

**Earl H. Beistline,** LL.D., Provost, Northern Region

**Lewis E. Haines,** Ph.D., Provost, Southcentral Region

**Charles O. Ferguson,** Ed.D., Provost, Southeastern Region

## HONORARY STAFF AND EMERITI

**Terris Moore,** President Emeritus and (Hon.) Professor of the University. Williams College '29, A.B.; Harvard '33, M.B.A.; '37, D.C.S.; University of Alaska '67, LL.D.; (President 1949-1953, Prof. 1953- )

**Ernest N. Patty,** President Emeritus. University of Washington '19, B.S.; '25, E.M.; University of Alaska '53, D. Engr. (Dean, 1925-1935, President, 1953-1960)

**Vena A. Clark,** Associate Professor of Home Economics, Emeritus. Cotner College '25, A.B.; Iowa State University '33, M.S. (1953-1967)

**Lydia Fohn-Hansen,** Associate Director of Cooperative Extension, Emeritus. Iowa State College '19, B.S.; '22, M.S.; University of Alaska '59, D. Hum. (1925-1936, 1940-1959)

**William K. Keller,** Professor of Education, Emeritus. State College of Washington '21, A.B. and M.A.; '41, Ed.D.; University of Alaska '61, LL.D. (1952-1961)

**Dorothy H. Novatney,** Professor of English, Emeritus. Pomona College '28, B.A.; Claremont College '30, M.A.; Teachers College '38, Ed.D. (1943-1945, 1956-1963)

**Lola Cremeans Tilly,** Professor of Home Economics, Emeritus. University of Illinois '20, A.B.; '21 M.S.; University of Alaska '63, D. Hum. (1929-1937, 1942-1963)

**Victor P. Hessler,** Professor of Geophysics, Emeritus. Oregon State University '26, B.S.; Iowa State University '27, M.S.; '34, Ph.D. (1955-1968, 1968- )

**Charles Sargent,** Dean, College of Mathematics, Physical Sciences and Engineering, Emeritus. University of Idaho '48, B.S.C.E.; Stanford University '58, M.S. (Professor, 1953-1961, Dean, 1961-1967)

**Agnes S. Sunnell,** Associate Professor of Extension, Emeritus. University of Washington '31, B.S.; Washington State University '44, M.S. (1960-1970)

**Laura Jones,** Director of Admissions and Registrar, Emeritus. University of Denver '41, B.A. (1956-1971)

**Minnie Wells,** Professor of English, Emeritus. University of Missouri '25, B.S.; New York University '38, Ph.D. (1945-1971)

**Bettie H. Clark**, Head, Alumni Services and Career Planning and Placement, Emeritus. University of Alaska '35, B.S. (1962-1972)

**William S. Wilson**, Head, Department of General Science, and Professor of Chemistry and General Science, Emeritus. Brown University '31, B.Sc.; '34, M.Sc.; Yale University '36, Ph.D. (1947-1972)

**James R. Leekley**, Senior Scientist in Charge, Petersburg Fur Farm, Emeritus. Oregon State University '38, B.S. (1941-1972)

## ACADEMIC FACULTY AND PROFESSIONAL STAFF 1973-74

The date following each name designates the time of original appointment to the University faculty or staff. (Dates of resignations and re-appointments are not indicated.)

A second date in parentheses follows each member's present rank and indicates the beginning of service in that rank.

**Aase, Jon M.** — 1971 — Lecturer in Medical Science (1971). Pomona College '58, B.A.; Yale University School of Medicine '62, M.D.

**Akasofu, Syun-Ichi** — 1958 — Professor of Geophysics (1964), Geophysical Institute. Tohoku University '53, B.S.; '57, M.S.; University of Alaska '61, Ph.D.

**Albrecht, C. Earl** — 1972 — Lecturer in Medical Science (1972). Moravian College '26, B.A.; Moravian Theological Seminary '28, B.D.; Jefferson Medical College '32, M.D.; Moravian College '51, LL.D. (Hon.); University of Alaska '64, D.Sc. (Hon.).

**Alexander, Vera** — 1962 — Associate Professor of Marine Science (1969), Institute of Marine Science. University of Wisconsin '55, B.A.; '62, M.S.; University of Alaska '65, Ph.D.

**Allen, George R.** — 1964 — Assistant Professor of English (1971). University of Alaska '64, B.A.; '64, M.A.

**Allen, Lee D.** — 1956 — Associate Agricultural Engineer (1972), Institute of Agricultural Sciences (Palmer Research Center). University of Idaho '57, B.S.; '72, M.S.

**Allison, Carol Wagner** — 1970 — Curator, Museum, Paleontological and Geological Collections (1970). University of California, Berkeley '53, B.A.; '63, M.A.; '70, Ph.D.

**Allison, Richard C.** — 1968 — Associate Professor of Geology (1968). University of Washington '57, B.S.; '59, M.S.; University of California '67, Ph.D.

**Anderson, James H.** — 1970 — Assistant Professor of Plant Ecology (1970), Institute of Arctic Biology. University of Washington '63, B.S.; Michigan State University '70, Ph.D.

**Andresen, Patricia** — 1967 — Assistant Professor of Mathematics (1967). University of Illinois '55, B.S.; University of Missouri '58, M.A.

**Arvey, Martha M.** —1969 — Assistant Professor of Library Science (1972). Scripps College '63, B.A.; University of California, Los Angeles '64, M.L.S.

**Aso, S. Jerry** — 1972 — Assistant Professor of English (1972). Union College '61, B.A.; University of Hawaii '69, M.A.

**Atamian, Sarkis** — 1962 — Associate Professor of Sociology (1967). University of Rhode Island '50, B.S.; Brown University '54, M.A.

**Ayotte, Ellen P.** — 1964 — Extension Home Economist and Assistant Professor of Extension (Tanana District) (1969). Stout State College '58, B.S.; University of Alaska '69, M.A.

**Backlund, Philip M.** — 1972 — Instructor in Speech (1972). Humboldt State College '69, B.A.; '71, M.A.

**Bain, Frank** — 1973 — Visiting Professor of Accounting (1973). University of North Dakota '29, B.S.C.; University of California at Berkeley '34, M.S.; '35, Ph.D.

**Baker, Steven M.** — 1973 — Visiting Assistant Professor of Mathematics (1973). Oregon State University '62, B.S.; '73, Ph.D.

**Barker, Patricia L.** — 1972 — Extension Home Economist and Instructor of Extension (Bethel) (1972). Washington State University '56, B.S.

**Barnhardt, Raymond J.** — 1970 — Assistant Professor of Education and Coordinator of Alaska Rural Teacher Training Corps (1970). North Dakota State University '65, B.S.; John Hopkins University '67, M.Ed.; University of Oregon '70, Ph.D.

**Barsdate, Robert J.** — 1962 — Professor of Marine Science (1972), Institute of Marine Science. Allegheny College '59, B.S.; University of Pittsburgh '64, Ph.D.

**Basye, Edmund L.** — 1967 — Internal Auditor (1969). University of Washington '49, B.A.; '52, C.P.A. Certificate.

**Bates, Howard F.** — 1952 — Professor of Geophysics and Professor of Electrical Engineering (1970), Geophysical Institute. Oregon State College '50, B.S.; '56, M.S.; University of Alaska '61, Ph.D.

**Bedford, Jimmy** — 1965 — Head, Department of Journalism and Professor of Journalism (1968). University of Missouri '50, A.B.; '51, B.J.; '52, M.A.

**Beharie, Neville O.** — 1973 — Assistant Professor of Economics (1973), Institute of Social, Economic, and Government Research. Inter-American University, Puerto Rico '66 B.A; University of Illinois '71, M.A.; '73, Ph.D.

**Behlke, Charles E.** — 1950 — Dean, College of Mathematics, Physical Sciences and Engineering (1967); Acting Dean, College of Biological Science and Renewable Resources (1972); Professor of Civil Engineering (1965). Washington State University '48, B.S.; '50, M.S.; Stanford University '57, Ph.D.; P.E.

**Behrisch, Hans Werner** — 1969 — Associate Professor (1973), Institute of Arctic Biology. University of British Columbia '64, B.S.; Oregon State University '66, M.A.; University of British Columbia '69, Ph.D.

**Beistline, Earl H.** — 1946 — Provost, Northern Region (1970); Dean, College of Earth Sciences and Mineral Industry (1949); Professor of Mining Engineering (1946). University of Alaska '39, B. Min. Engr.; '47, E.M.; '69, LL.D. (Hon.); P.E.

**Bellinger, Helen F.** — 1973 — Director of Purchases (1973).

**Belon, Albert E.** —1956 — Professor of Physics (1969), Geophysical Institute. University of Alaska '52, B.S.; University of California, Los Angeles '54, M.A.

**Benesch, Walter J.** —1963 — Professor of Philosophy (1973). University of Denver '55, B.A.; University of Montana '56, M.A.; Leopold Franzens Universitaet Innsbruck '63, Ph.D.

**Bennett, F. Lawrence** — 1968 — Head, Department of Engineering Management, and Associate Professor of Engineering Management (1968). Rensselaer Polytechnic Institute '61, B.C.E.; Cornell University '63, M.S.; '66, Ph.D.; P.E.

**Benson, Carl S.** — 1960 — Professor of Geophysics and Geology (1969). University of Minnesota '50, B.A.; '56, M.S.; California Institute of Technology '60, Ph.D.

**Benson, Ruth G.** —1972— University Nurse (1972). Northwestern University '55, B.S. in Nursing; Evanston Hospital School of Nursing '55, Diploma.

**Bergeson, Mark E.** — 1972 — Instructor in Speech (1972). San Francisco State College '69, B.A.; '71, M.A.

**Bernet, John W.** — 1959 — Associate Professor of English (1970). State University of Iowa '51, B.A.; University of North Dakota '57, M.A.; Stanford University '69, M.A.; '69, Ph.D.

**Berry, Franklin L.** — 1972 — Coordinator, Alaska Educational Program for Intercultural Communication (1973). University of Alaska '67, B.Ed.; '72, M.Ed.

**Billaud, Jean-Paul** —1965—Professor of Music (1970). Ecole Normale de Musique de Paris '55, Diplome Superieur de Virtuosite; '56, License de Concert; Laureate International Competitions: "Viotti" (Italy) '56; Paris '57.

**Biswas, Nirendra N.**—1971—Assistant Professor of Geophysics (1971), Geophysical Institute. Indian Institute of Technology, India '55, B.Sc. Hons; M. Tech; University of California, Los Angeles '70, Ph.D.

**Boelts, Norman R.**—1970—Visiting Assistant Professor of Business Administration (1973). University of Nebraska '67, B.S.; Texas Christian University '68, M.B.A.

**Bohanan, Mary L.**—1972—Home Economics Agent and Instructor of Extension (Northwestern District) (1972). University of Alaska '72, B.S.

**Bowkett, Gerald E.** —1971— Manager, News Service (1971). San Francisco State College '52, B.A.

**Bowkett, Norma S.**—1962—Instructor in English (1973). San Francisco State College '53, B.A.; '53, M.A.

**Bowling, Sue Ann** — 1970 — Assistant Professor of Geophysics (1972), Geophysical Institute. Radcliffe '63, A.B.; University of Alaska '67, M.S.; '70, Ph.D.

**Brenckle, Carol A.** — 1972 — Instructor in Library Science (1972). Marymount Manhattan College '63, B.A.; University of California, Berkeley, '71, M.L.S.

**Brenckle, Joseph J., Jr.**—1971—Assistant Professor of Russian (1971). Brown University '62, A.B.; Stanford University '65, M.A.; '71, Ph.D.

**Brown E. Staples**—1967—Assistant Director, Physical Plant (1973). University of Maine '63, B.S.M.E.; University of Alaska '67, M.S.E.M.; P.E.

**Brown, J. Frank** — 1967 — Coordinator of Central Personnel Services (1968), Brigham Young University '60, B.S.; '65, M.B.A.

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**Rice, Elbert F.**—1952—Professor of Civil Engineering (1957). University of Idaho '48, B.S.; Oregon State College '49, M.S.; '55, Ph.D.

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**Ryberg, H. Theodore**—1963—Director of Libraries and Professor of Library Science (1963). Gettysburg College '55, A.B.; Western Reserve University '57, M.S.

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**Scarborough, William B.**—1969—Marketing Specialist and Associate Professor of Extension (Fairbanks) (1969). New Mexico State University '50, B.S.; '65, M.S.

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**Shapiro, Lewis H.**—1971—Assistant Professor of Geology (1971), Geophysical Institute. South Dakota School of Mines and Technology '62, B.S.; University of Minnesota '71, Ph.D.

**Sharma, Ghanshyam Datt**—1963—Associate Professor of Marine Science (1969), Institute of Marine Science. Benares Hindu University '52, B.S.; Swiss Federal Institute of Technology '58, Diploma of Engineering Geology; University of Michigan '61, Ph.D.

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**Silver, Alan Howard**—1969—Assistant Professor of Physical Education (1972). Pierce Junior College '65, A.A.; Fresno State College '68, B.A.; California Polytechnic '69, M.S.

**Simpson, Glen C.**—1969—Dept. Head and Assistant Professor of Art (1970). Rochester Institute of Technology '68, B.F.A.; '69, M.F.A.

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**Smith, Jewel Busch**—1967—Assistant Professor of Home Economics (1967). University of Wisconsin '46, B.S.; University of New Mexico '57, M.A.

**Smith, R. London**—1965—Associate Professor of Political Science (1965). College of St. Joseph '54, B.A.; University of Oklahoma '55, M.A.; American University '64, Ph.D.

**Smith, Ronald L.** —1968— Assistant Professor of Zoology (1968). Occidental College '64, B.A.; University of Miami '67, M.S.; '68, Ph.D.

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**Snyder, Robert**—1968—Assistant Professor of Forest Economics (1968), Institute of Social, Economic, and Government Research. University of Illinois '61, B.S.; Oregon State University '62, M.F.

**Soboleff, Walter A.**—1971—Native Studies Program Coordinator and Lecturer in History (1971). Dubuque University '37, B.A.; '40, B.D.; '52, D.D.; University of Alaska '68, L.H.D. (Hon.).

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**Solli, George A.**—1965—Facility Coordinator (Northern Region), Business Office (1972). University of Connecticut '58, B.S.E.

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**Stark, David A.**—1971—Instructor in English (1971). University of California, Los Angeles, '65, B.A.; University of California, Irvine, '69, M.F.A.

**Stech, David A.**—1972—Instructor in Music (1972). University of Minnesota '67, B.S.; The Ohio State University '69, M.A.

**Stinson, Lillian Powers**—1972—Assistant Professor of Education (1972). University of Illinois '58, B.S.; '64, M. Ed.; '70, Ed.D.

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**Straatsma, Glen W.**—1973—Clinical Associate in Medical Science (1973). Hope College (Michigan) '54, B.A.; Phipps University Medical School (Germany) '62, M.D.

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**Sullivan, Robert A.**—1964—Assistant Professor of Mathematics (1967). St. Bonaventure University '52, B.S.; '61, M.S.; University of Illinois '69, M.A.

**Surbaugh, Christine K.**—1973—Counselor, Student Orientation Service (1973). University of Iowa '73, B.A.

**Svenningson, Allen R.**—1967—Associate Professor of Physical Education (1967). Winona State College '58, B.S.; Colorado State College '61, M.S.

**Swartz, L. Gerard**—1958—Professor of Zoology (1968). University of Illinois '53, B.S.; '54, M.S.; '58, Ph.D.

**Sweet, Larry R.**—1966—Associate Supervisory Engineer (1969), Geophysical Institute. Washington State University '63, B.S.; University of Alaska '72, M.S.

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**Teal, John J.**—1964—Research Professor of Animal Husbandry and Human Ecology (1965). Harvard University '44, B.S.; Yale University '46, M.A.

**Teas, John A.**—1961—Associate Design Engineer (1969). Geophysical Institute. Texas Technological College '61, B.S.E.E.

**Theophilus, Donald R**—1969—Vice President for Academic and Faculty Affairs and Professor of Education (1969). University of Idaho '53, B.A.; Harvard University '58, M.B.A.; University of Michigan '67, Ph.D.

**Thomas, Wayne C.** —1971— Assistant Professor of Economics (1971), Institute of Agricultural Science. California State Polytechnic College '65, B.S.; University of Nevada '67, M.S.; Washington State University '71, Ph.D.

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