



GRADUATE DEGREES

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UAF graduate students James Smaby and Kathryn Hendrickson practice a duet at Ballaine Lake.

How to Earn a Graduate Degree

General university and specific degree requirements for UAF graduate programs are described in this section of the catalog, along with requirements for each graduate program. You'll find instructions for applying for admission beginning on page 29.

Academics, Policies and Regulations

Many academic policies and regulations apply to both graduate and undergraduate students. These guidelines are relevant to your academic experience at UAF and important for you to read and understand. Topics include definitions and requirements for official university communications, full- and part-time student status, academic progress, academic dismissal, grading system and policies, FERPA and the student code of conduct. See page 47 for descriptions of UAF academics, policies and regulations.

General University Requirements

• Catalog and Time Limit

You may elect to graduate under the degree requirements in effect the first semester of your enrollment in your graduate degree program or under the catalog in effect when you graduate. However, if you do not meet continuous registration requirements, you waive the right to use the catalog in effect when you first entered your graduate program; you will use either the catalog in effect during the semester of your re-entry or the catalog in effect when you graduate.

All non-academic policies and regulations listed in the current catalog apply, regardless of the catalog you are using for your degree requirements. You must satisfactorily complete all course work listed on your Advancement to Candidacy form and all other degree requirements within seven years for a master's degree and 10 years for a Ph.D.

• Grades and Grade Point Average

You must have a cumulative GPA of 3.0 in the courses identified on your Advancement to Candidacy form to remain in good standing and to graduate. In addition, for the purpose of satisfying degree requirements, you must earn a B (3.0) or better (no P grades) in each F400-level course and a C grade (2.0) or better in each F600-level course. NOTE: A B- is less than a 3.0 and, if obtained in a F400-level course, will not count for meeting degree requirements; likewise, a C- is less than a 2.0 and, if obtained in a F600-level course, will not count for meeting degree requirements.

• Registration Requirement

Graduate students must be registered for at least 6 credits per year (fall, spring, summer), in graduate or F400-level courses relevant to the graduate degree, while actively working toward a degree. Those who wish to temporarily suspend their studies should obtain an approved leave of absence.

You must be registered for at least 3 graduate credits in the semester in which you receive your degree and you must apply for graduation in that semester.

• Temporary Leave of Absence

If you need to temporarily suspend studies while earning a graduate degree, you must obtain an approved leave of absence. If you fail to register for at least 6 graduate or F400-level credits in a school year (fall, spring or summer semester) or to obtain a leave of absence, you will be dropped from graduate study and will have to be reinstated before resuming graduate studies. Contact the Graduate School for information at 907-474-7464.

• Transfer Credit

Up to one-half of all graduate degree credits approved for a graduate program may be transferred from UAA and UAS. No more than one-third of approved program credits may be transferred from other accredited institutions outside the UA system. Transferred credits may not be used from a previously earned degree. A minimum B grade (3.0) is required in all graduate courses presented for transfer.

• Credits Earned While Non-Degree Seeking

A student who earned post-baccalaureate degree credits while studying as a non-degree student at UAF may, with approval of the graduate advisory committee, apply those credits toward a graduate degree. However, no more than one-half of all credits used to meet the requirements of a graduate degree may be credits earned as a non-degree student.

• Course Restrictions

You may not use credit by examination, audited courses, F100-, F200-, F300-, and F500-level courses, or courses taken under the credit/no credit option to fulfill the basic course requirements of any degree program. No more than 12 credits of special topics courses (F693 or F695) or individual study (F697) may be used toward a graduate degree. The dean of the Graduate School must approve requests for exceptions to the limit.

• Deficiencies

Your advisory committee may require that you remedy certain deficiencies in your program. Your committee will determine early in the program both how to

remedy the deficiencies and the minimum level of performance required of you. Graded undergraduate courses taken to remedy a deficiency must receive a grade of B (3.0) or better. Deficiency courses are not listed on the Advancement to Candidacy form.

- **English Proficiency**

You must be proficient in written and oral English. Your advisory committee will determine requirements to remove any such deficiencies. These requirements may not be used to fulfill the language/research tool requirement of some departments.

- **Cooperative Programs**

Some students may develop cooperative programs using specific courses from other universities before being admitted to graduate study at UAF. As part of the application process, the cooperative program must be included in an approved Graduate Study Plan. The student must complete a minimum of 12 semester credits in residence at UAF, in addition to thesis and research.

The following guidelines are for collaborative Ph.D. graduate studies across all UA academic units. Some individual degree programs have different requirements which are included in specific program descriptions in the graduate degree program section of the catalog. The guidelines described here apply only to programs that have not established different requirements.

1. At least four faculty members shall serve on the graduate advisory committee for each Ph.D. student. At least two committee members shall be UAF faculty. One of the UAF committee members must be on a tenure-track appointment in a Ph.D.-granting department. The committee shall be chaired or co-chaired by a UAF faculty member.
2. The graduate advisory committee and its chair and/or co-chairs must be approved by the program director and the dean of the Graduate School.
3. UAF rules and regulations on graduate studies shall apply to all UAF graduate students, including those concurrently enrolled at UAA and UAS.
4. The graduate advisory committee must meet at least once a year to update the Graduate Study Plan and to review the student's progress toward the degree. The annual progress report must be signed by all committee members and submitted to the dean of the UAF Graduate School.
5. A comprehensive exam committee composed of the student's advisory committee will administer the Ph.D. comprehensive exam for each student.
6. The Ph.D. thesis defense is to be conducted on the UAF campus.

GRADUATE ADVISORY COMMITTEE

A graduate advisory committee is normally appointed within the first semester of study to guide students in developing and completing their degree programs.

Committee members for graduate degrees are approved by the appropriate dean, usually upon recommendation of the department head, and by the dean of the Graduate School. Advisory committees for interdisciplinary students are approved by the dean of the Graduate School. Each interdisciplinary student follows procedures through the department of his or her advisory committee chair. The committee chair's department will be the "home" of the interdisciplinary student for academic purposes.

The graduate advisory committee's major responsibilities are to formulate a Graduate Study Plan, in consultation with the student, by the end of the student's second semester in the graduate program; to develop a tentative timetable for completion of all requirements for the degree program; to monitor the student's progress in course work and research; to provide advice and feedback to the student on that progress; to file an Annual Report of Graduate Student Advisory Committee with the Graduate School; to approve, where appropriate, a research topic; to supervise the preparation of the research thesis or project when one is required; to uphold the standards of the college/school and the university; to inform the dean, in writing, if a student's performance is inadequate and provide relevant recommendations; and to formulate and conduct the comprehensive examination and other exams as required by the department. The student's advisor (major professor, advisory committee chair) acts as head of the graduate advisory committee and takes the lead in fulfilling these responsibilities.

- **Master's Degree**

The core advisory committee of master's degree students must consist of three approved UAF faculty members. Participating faculty above this number are considered additional committee members. Committee membership must be approved by the home department, unit dean and the dean of the Graduate School.

Retired or emeritus UAF faculty who have an association with the home department may serve on master's advisory committees, upon expressed approval by the home department.

Faculty from other universities and other professionals who are not employed by UAF may serve as either core or additional committee members on master's advisory committees, upon expressed approval by the home department. They may not serve as the chair of an advisory committee, but may serve as co-chair.

- **Doctoral Degree**

The core advisory committee of doctoral degree students must consist of four approved UAF faculty members (all must have a Ph.D. or equivalent). For interdisciplinary students, one advisory committee member must be from a Ph.D.-granting department or be approved as the graduate school representative by the graduate school dean, based on prior experience advising Ph.D. students. Participating faculty above this number are considered additional committee members.

Committee membership must be approved by the home department, unit dean and the dean of the Graduate School.

Retired or emeritus UAF faculty who have an association with the home department may serve on doctoral advisory committees, upon expressed approval by the home department.

Faculty from other universities and other professionals who are not employed by UAF may serve as either core or additional committee members on doctoral advisory committees (all must have a Ph.D. or equivalent), upon expressed approval by the home department. They may not serve as the chair of an advisory committee, but may serve as co-chair.

GRADUATE STUDY PLAN

Graduate students must file a Graduate Study Plan with the Graduate School before the end of their second semester in a UAF graduate degree program. The GSP outlines the curriculum of study and a timetable the student must follow in meeting graduate degree requirements. The GSP is prepared by the advisory committee in consultation with the student. It is an agreement of mutual expectations between the student and the faculty committee. The GSP not only contains the specific degree requirements but also indicates the mechanism for fulfilling these requirements (e.g., via course work, examinations, readings, internships or other supervised experience) and a projected timetable.

CHANGING PROGRAMS

Graduate students may change their program only when the areas of emphasis or the degree are within the same department (e.g., from an M.A. in anthropology to a Ph.D. in anthropology, or from a Ph.D. in Biochemistry and molecular biology to a Ph.D. in environmental chemistry). If the change meets those requirements, you may change programs by completing a change of major form, available from the Graduate School's website. Regardless of when you submit the form, a change of program doesn't become effective until the beginning of the upcoming fall or spring semester. If, however, you want to change to a program in a different department, school or college (e.g., from an M.S. in civil engineering to an M.S. in biology), you must submit a new application for admission so faculty in the new degree program may fully review your credentials. For more information, contact the Graduate School at 907-474-7464.

ADVANCEMENT TO CANDIDACY

Advancement to candidacy formally establishes your specific degree requirements and should be done as soon as possible after qualifying. At the latest, you should submit your application for advancement to candidacy one semester before you are awarded your degree.

The finalized Graduate Study Plan should be the basis for completing the Advancement to Candidacy form. Students must have a cumulative GPA of 3.0 in the courses identified on the Advancement to Candidacy form. For the purpose of satisfying degree requirements students must earn a B (3.0) or better (no P grades) in each F400-level course and a

C grade (2.0) or better in each 600 level course. A B- is less than a 3.0 and, if obtained in a F400 course, will not count for meeting degree requirements; likewise a C- is less than a 2.0, and if obtained in a F600-level course, will not count for meeting degree requirements.

Admission to graduate study does not imply advancement to candidacy for a degree. The graduate advisory committee has the option of refusing to recommend a student to candidacy.

• Master's Degree

You may apply for advancement to candidacy for a specific master's degree if you are in good standing and you have:

1. Satisfactorily completed at least 9 semester credits of graduate study at UAF (study after admission to a specific degree program).
2. Received approval of a provisional thesis or project topic.
3. Received approval of the finalized Graduate Study Plan, including specific course work to be completed and any other requirements.

• Doctoral Degree

You may apply for advancement to candidacy for the Ph.D. degree if you are in good standing and you have:

1. Completed the full time equivalent of two academic years of graduate study.
2. Completed at least 9 UAF credits.
3. Received approval of the Graduate Study Plan.
4. Obtained approval of the advisory committee for the title and synopsis of the thesis.
5. Passed a written comprehensive examination.

EXAMINATIONS

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

• Placement Examinations

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

• Qualifying Examinations

A few master's degree programs require the student to complete a written and/or oral qualifying examination before advancement to candidacy. This examination is an interim evaluation of academic progress; the student may pass unconditionally or conditionally. A conditional pass indicates specific weaknesses that the student must remedy before degree requirements are completed. The Graduate Study Plan and later the Advancement to Candidacy form should include mechanisms for addressing these weaknesses.

- **Comprehensive Examination**

The comprehensive examination is given to determine whether the student has integrated knowledge and understanding of the principles and concepts underlying major and related fields. It may be oral or written or a combination of both. Ph.D. degree students normally take a written comprehensive examination within two academic years of entering the program, but no later than two academic years before the expected completion of the degree (whichever is earliest). The Ph.D. student's advisory committee may choose to give an oral examination to supplement the written comprehensive examination. Each Ph.D. student must pass the comprehensive examination prior to advancement to candidacy.

- **Defense of Project**

Graduate Students who are required to complete a project in partial fulfillment of degree requirements must pass an oral defense of project examination. The defense will consist of a presentation followed by questions on the research, analysis and written presentation. All committee members must be present at the project defense.

- **Defense of Thesis Examination**

Graduate students who are required to complete a thesis in partial fulfillment of degree requirements must pass an oral defense of thesis examination. The defense will consist of a presentation followed by questions on the research, analysis and written presentation. The Graduate School will not accept a thesis for final submission until the student has successfully defended it. The Ph.D. thesis defense is to be conducted on the UAF campus. All committee members must be present for the defense of thesis.

- **Examination Committee**

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

- **Outside Examiner**

An outside examiner representing and appointed by the dean of the Graduate School is required at all Ph.D. oral examinations (except the placement examination). The examiner must be from a different department than the student and the chair of the advisory committee. The outside examiner is present to determine that a stringent, unbiased examination is fairly administered and evaluated.

- **Language/Research Tool Requirement**

Proficiency in a second language or a research tool is not a university requirement, but some departments or programs may make this requirement. An advisory committee may specify a language or research tool if its requirements exceed those of the program.

The specific language or research tool is determined by the advisory committee, guided by policies of the administrative unit in which the degree is offered. Generally, competency in a second language is required. However, upon approval of the department or program head, the committee may substitute computer languages, statistics, mathematics, or study in areas such as history or philosophy of science, business, administration, law, or economics. In all instances, topics selected must support the student's degree program.

GRADUATION

- **Responsibility**

You are responsible for meeting all requirements for graduation.

- **Application for Graduation**

You must be registered for at least 3 graduate credits in the semester in which you receive your degree. You must file an application for graduation and a non-refundable fee with the Registrar's Office. We encourage you to apply for graduation in the semester prior to the semester you plan to graduate. Applications for graduation filed after the published deadline will be processed for graduation the following semester. You need not have all requirements met before you apply for graduation. The application is an indication that you are planning to finish all degree requirements during the intended graduation semester. Students who apply for graduation and who do not complete degree requirements by the end of the semester must reapply for graduation and pay the fee again.

- **Diplomas and Commencement**

UAF issues diplomas to graduates three times each year: in September, January and June. All students who complete degree requirements during the academic year are invited to participate in the annual commencement ceremony at the end of spring semester. Names of students receiving degrees appear in the commencement program and are released to the media unless the student has a confidential hold on file with the Office of the Admissions and the Registrar. Students who do not want their names to be released may so indicate on the application for graduation form. Graduates are responsible for ordering caps and gowns through the UAF bookstore in early spring.

Graduate Assistantships

Graduate assistants receive stipends for either a semester or the academic year. Graduate assistants can be paid for a maximum of 20 hours per week while school is in session. Students with assistantships must be registered for at least 9 credits during both the fall and spring semesters (audited credits are not eligible).

Any exceptions to the 20-hour per week rule must be approved by the student's committee chair, department head,

college dean and dean of the Graduate School. Complete a Student Employee Waiver Form (available at www.alaska.edu/hr/forms/int_personnelforms/) to request approval of more than 20 student work hours per week. Foreign nationals on temporary student visas are not permitted to work more than 20 hours a week while classes are in session and are not eligible for an overload waiver.

Teaching assistantships include a tuition payment by the university for no more than 10 credits each semester if the workload is 15 to 20 hours per week. If the workload is 10 to 14 hours per week, no more than 5 credits will be included. No tuition will be included if the workload is less than 10 hours per week.

Research assistantships include a tuition payment by grants/contracts for no more than 10 credits during each semester if the workload is 15 to 20 hours per week. If the workload is 10 to 14 hours per week, no more than 5 credits will be included. No tuition will be included if the workload is less than 10 hours per week.

Tuition payments must be used for courses directly related to the student's degree program. All fees are the responsibility of the student unless the department or institute makes other arrangements with the UAF Graduate School prior to registration.

A graduate student with a GPA of less than 3.0 for one semester will be allowed to petition to continue as a graduate assistant for the next semester, but only once. The petition by the student must be approved by the student's advisory committee chair, department head, college dean and dean of the Graduate School.

Graduate Certificates

Graduate certificate programs are designed to provide education past the baccalaureate level and/or to meet clearly defined educational needs of students who have already completed a master's degree. Completion of a graduate certificate should prepare students to better accomplish their goals or meet employment criteria.

These programs typically require between 12 and 15 credits and provide the student with formal recognition of mastery of a clearly defined academic topic. The credit hours may be applied to other graduate programs where applicable.

Requirements for Graduate Certificates

In order to earn a graduate certificate, students must be admitted to the program and complete the requirements listed in the program section of this chapter. Most graduate certificates are between 12 – 18 credits. You must have a cumulative GPA of at least 3.0 in all course work and be registered in the semester you plan to graduate.

Students may elect to complete their program under the requirements of the catalog in effect at the time of formal acceptance to a graduate certificate program or the catalog in effect at the time of graduation. Students may earn more

than one graduate certificate by completing all requirements for each additional program.

Requirements for Graduate Degrees

MASTER'S DEGREES

UAF offers research-oriented (thesis or project) and practice-oriented (non-thesis) master's degrees. Research-oriented programs are designed to direct graduate students toward scholarly activity that leads to the acquisition of new knowledge. Practice-oriented programs prepare graduate students for professional practice and direct them toward application or transmission of existing knowledge. All degree requirements must be completed within a seven-year period. UAF tenured faculty, tenure track faculty and research faculty are not eligible to become candidates for a graduate degree within the discipline in which they teach.

The minimum requirements for a master's degree at UAF are as follows (individual departments may have additional requirements):

• Steps Required for All Master's Degrees

1. Formulate a unified degree program, in cooperation with your graduate advisory committee. Degree programs must be composed of courses in the discipline or clearly related to and/or supportive of that discipline. All courses to be applied toward the degree must be approved by the advisory committee and follow the requirements set forth by the department that sponsors the degree.
2. Specifically, master's degree students must:
 - a. Be registered for a minimum of 6 F600- or F400-level credits per year (fall, spring and summer combined) or have an approved leave of absence form on file.
 - b. Submit an Appointment of Committee form by the end of the first semester of study.
 - c. Submit a Graduate Study Plan by the end of the second semester of study.
 - d. Submit a Report of Advisory Committee form by May 15 of every year.
 - e. Pass a written and/or oral comprehensive examination which may be combined with a project or thesis defense. Some programs (e.g., the M.B.A. degree program) may substitute a capstone course or synthesizing paper for the comprehensive examination. This includes demonstration of the ability to synthesize information in the field at a level appropriate for a master's degree.
 - f. Submit an Advancement to Candidacy form to the Graduate School. Once submitted, this form supplants the GSP and formally establishes specific degree requirements.
 - g. Pass an oral defense of the thesis or project if a thesis or project is required.

- h. Submit an application for graduation and be registered for at least 3 graduate credits in the semester in which the degree is to be awarded.
- i. Complete all degree requirements within the seven-year time limit.

• **Credit Requirements**

1. Successfully complete a minimum of 30 semester credits.
2. Successfully complete at least 21 semester credits, including those earned for thesis and research/project, at the F600-level. Remaining credits may be applied from courses at the F400-level.
3. No F100-, F200-, F300-, or F500-level credits or audited courses may be applied toward master's degree requirements.
4. For programs requiring a thesis, a maximum of 12 credits of thesis (699)/research (698) (with a minimum of 6 credits of thesis) may be applied toward degree requirements. For programs requiring a project, a maximum of 6 research (698) credits may be applied toward degree requirements. A student may enroll in as many thesis and/or research credits as needed to remain in good standing.

• **Second Master's Degree Programs**

At the discretion of your advisory committee, admitting department and dean, you may transfer up to 20 percent of the minimum number of credits required for a UAF master's degree from a previously earned master's degree. Transferred credit may not be research, project or thesis credit. The transferred credit must be for completed graduate-level courses and not portions of a course. For a 30-credit master's degree, for example, up to 6 graduate credits may be transferred; for a 45-credit master's degree, up to 9 graduate credits may be transferred. The following requirements apply to students who wish to pursue a second master's degree:

1. Submit a new application, including application processing fee, updated transcripts and three new reference letters.
2. Acceptable GRE scores submitted previously may be applied to a second master's degree.
3. Fulfill all general university requirements for the second master's degree, including taking a comprehensive exam (if required), completing a minimum of 30 semester credits (including thesis, research and transfer credits), and passing a defense of thesis or project.
4. All work used to fulfill degree requirements for a second master's degree must be completed within seven years.

DOCTOR OF PHILOSOPHY DEGREE

The doctor of philosophy degree is granted in recognition of scholarly attainment and proven ability. UAF tenured faculty, tenure track faculty and research faculty are not eligible to become candidates for a graduate degree within the discipline in which they teach at UAF.

• **Steps Required for all Doctoral Degrees**

1. The Ph.D. degree requires at least three full years of study beyond the baccalaureate degree. (See transfer credit.)
2. In addition to satisfactory completion of a plan of study developed in accordance with requirement listed above, the Ph.D. candidate must:
 - a. Be registered for at least 6 F600- or F400-level credits per year (fall, spring and summer combined) or have an approved leave of absence form on file.
 - b. Submit an Appointment of Committee form by the end of the first semester of study.
 - c. Submit a Graduate Study Plan by the end of the second semester.
 - d. Submit a Report of Advisory Committee form by May 15 of every year.
 - e. Submit an Advancement to Candidacy form to the Graduate School. Once submitted, this form supplants the GSP and formally establishes specific degree requirements.
 - f. Satisfactorily complete a dissertation that is a substantial contribution to the body of knowledge in the area studied.
 - g. Pass an oral defense of the dissertation (an outside examiner is required). The oral defense of the dissertation must be conducted on the UAF campus.
 - h. Apply for graduation and be registered for at least 3 graduate credits in the semester in which the degree is awarded.
 - i. Complete all degree requirements within the 10-year time limit.
 - j. Archive dissertation in the UAF Rasmuson Library.

• **Credit Requirements**

1. A minimum of 18 thesis (699) UAF credits must be earned.
2. No F100-, F200-, F300-, F500-level credits or audited courses may be applied toward the Ph.D.'s degree requirements.

EXCEPTIONS TO DEGREE REQUIREMENTS

Deviations from academic requirements and regulations for graduate students must be approved by academic petition using the form available on the Graduate School website. Petitions must be approved by the student's graduate advisory committee, the department chair of the student's program, the dean of the school or college and the dean of the Graduate School.

Types of Master's Degrees

MASTER OF ARTS — WITH THESIS

1. Successfully complete at least 30 credits of course work including at least 6 credits of thesis (F699). No more than 12 thesis/research (F699/F698) credits may be counted toward the minimum degree credits. At least 21 credits, including those earned for thesis and research/project, must be at the F600-level.
2. Pass a written and/or oral comprehensive examination (may be combined with the thesis defense).
3. Present and defend the thesis.
4. Submit a completed and signed thesis defense form to the Graduate School.
5. Archive the thesis in the UAF Rasmuson Library.

MASTER OF ARTS — WITH PROJECT

1. Successfully complete at least 30 credits of course work including at least 6 credits of project work (F698), unless the degree requirements of a particular program specify that a 3-credit project is permitted. No more than 6 research (F698) credits may be counted toward the minimum degree credits. At least 21 credits, including those earned for thesis and research/project, must be at the F600-level.
2. Pass a written and/or oral comprehensive examination (may be combined with the project defense).
3. Present and defend the project.
4. Submit a completed and signed project defense form to the Graduate School.

MASTER OF ARTS IN TEACHING

The master of arts in teaching program is designed to serve baccalaureate graduates who qualify for the Alaska secondary school certificate, who intend to make secondary school classroom teaching their career, and who wish to take additional work in their teaching major and/or minor as well as in professional education courses. A bachelor's degree and teaching credentials are required for admission to an M.A.T. program. A student enrolls in the department in which the approved M.A.T. program is located. The M.A.T. degree has been approved for the following subject areas: biology, mathematics and physics. The M.A.T. degree requires that the student:

1. Complete general university and master's degree requirements.
2. Complete 36 credits, of which at least 24 credits, including research, must be at the F600-level. No more than 6 credits of research may apply toward the degree.
3. Pass a written comprehensive exam given by the student's advisory committee. There is no thesis requirement.

MASTER OF SCIENCE — WITH PROJECT

1. Successfully complete at least 30 credits of course work including at least 6 credits of project work (F698), unless the degree requirements of a particular program specify that a 3-credit project is permitted. No more than 6 research (F698) credits may be counted toward the minimum degree credits. At least 21 credits, including those earned for thesis and research/project, must be at the F600-level.
2. Pass a written and/or oral comprehensive examination (may be combined with the project defense).
3. Present and defend the project.
4. Submit a completed and signed project defense form to the Graduate School.

MASTER OF SCIENCE — WITH THESIS

1. Successfully complete at least 30 credits of course work including at least 6 credits of thesis (F699). No more than 12 thesis/research (F699/F698) credits may be counted toward the minimum degree credits. At least 21 credits, including those earned for thesis and research/project, must be at the F600-level.
2. Pass a written and/or oral comprehensive examination (may be combined with the thesis defense).
3. Present and defend the thesis.
4. Submit a completed and signed thesis defense form to the Graduate School.
5. Archive the thesis in the UAF Rasmuson Library.

MASTER OF BUSINESS ADMINISTRATION

1. Complete at least 30 credits of course work. At least 24 credits must be at the F600-level (6 at the F400-level).
2. Successful completion of a capstone course that includes demonstration of the ability to synthesize information in the field at a level appropriate for a master's degree.

MASTER OF CIVIL ENGINEERING

1. Complete at least 30 credits of course work. At least 21 credits, including those earned for thesis and research/project, must be at the F600-level.
2. Complete a comprehensive exam or capstone course that includes demonstration of the ability to synthesize information in the field at a level appropriate for a master's degree.

MASTER OF EDUCATION

1. Complete at least 30 credits of course work. At least 24 credits, including those earned for thesis and research/project, must be at the F600-level.
2. Complete a comprehensive exam or synthesizing paper that includes demonstration of the ability to synthesize information in the field at a level appropriate for a master's degree.

MASTER OF ELECTRICAL ENGINEERING

1. Complete at least 32 credits of course work. At least 26 credits, including those earned for thesis and research/project, must be at the F600-level.
2. Complete a comprehensive exam or capstone course that includes demonstration of the ability to synthesize information in the field at a level appropriate for a master's degree.

MASTER OF FINE ARTS

A general description is available in creative writing (see English) and art.

MASTER OF NATURAL RESOURCES MANAGEMENT AND GEOGRAPHY

A general description is available in the graduate degree programs listing.

MASTER OF SOFTWARE ENGINEERING

A general description is available in the graduate degree programs listing.

SPECIALIZED PROGRAMS

The master's programs in northern studies, administration of justice and rural development at UAF have been selected as unique or specialized graduate programs by the Western Regional Graduate Program of the Western Interstate Commission for Higher Education. This designation means that residents of Arizona, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, Utah, Washington and Wyoming who major in any of these specialized programs at UAF pay resident tuition.

PEACE CORPS MASTER'S INTERNATIONAL PROGRAM

UAF and the U.S. Peace Corps participate in a cooperative master's degree program. This program provides an opportunity to integrate graduate study in rural development or natural resources management with international development practice through Peace Corps field experience.

To complete the program, two semesters of course work for the master's degree in rural development or natural resources management must be taken on the campus. This year of course work is followed by a two-year Peace Corps Volunteer assignment. On completion of the volunteer assignment, students return to the UAF campus to finish the master's degree requirements.

Students completing the program will be awarded a master of arts degree in rural development in the College of Rural and Community Development or a master of science degree in natural resources management in the School of Natural Resources and Agricultural Sciences.

Additional information is available by email at peacecorps@uaf.edu or by calling 907-474-7464.

Graduate Degree Programs

ANTHROPOLOGY

College of Liberal Arts
Department of Anthropology
907-474-7288
www.uaf.edu/anthro/

M.A., Ph.D. Degrees

Minimum Requirements for Degrees: M.A.: 30 – 36 credits;
Ph.D.: 18 thesis credits

The anthropology program offers a balanced and flexible program of academic courses and research opportunities in cultural anthropology, linguistic anthropology, archaeology and biological anthropology. Anthropology contributes to an understanding of the complex problems of human behavior, biology, language, cultural and social organization, and the relationship of humans to their environments. Research carried out in the field, laboratory and library emphasizes past and present modes of living and the origins and distribution of peoples and cultures throughout the world, with special attention to the circumpolar North.

The graduate program emphasizes general preparation in the field of anthropology. Such preparation enables graduates of the master's program to pursue more advanced training leading to the Ph.D. in anthropology, prepares them to teach anthropology within secondary education and/or undergraduate levels of higher education or prepares students for career positions with various levels of government in which some anthropological background and/or expertise is beneficial. Field research in Alaska is a common experience for graduate students in anthropology. All students must have fieldwork and laboratory experience appropriate to the discipline or subdiscipline.

The primary focus of the Ph.D. program is on the circumpolar North, although graduate students and faculty also conduct research elsewhere, in particular Africa and North America. The Ph.D. is available with an emphasis in any of the four subfields of anthropology.

Graduate Program — M.A. Degree

Complete the admission process including the following:

1. Submit GRE scores.
2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206).
4. Complete the following:
ANTH F629—Structures of Anthropological Argument 3
ANTH F652—Research Design and Professional Development Seminar 3
5. Complete 18 credits established by the advisory committee, or complete the following requirements for a linguistic anthropology master's degree:
 - a. Complete at least four semesters of an appropriate language (requirement may be met by previous language study or demonstrated competence).
 - b. Complete the following courses as part of the 18 credits required by the advisory committee (noted in part 5):
ANTH F631—Language and Culture Seminar 3
ANTH/LING F632—Field Methods in Descriptive Linguistics 3

6. Complete one of the following:
ANTH F698—Research (6)
or ANTH F699—Thesis (6) 6
7. Minimum credits required 30 – 36
Note: At least 24 credits must be regular course work (not research or thesis) with 21 of these credits at the F600-level.

Graduate Program — Ph.D. Degree

Complete the admission process including the following:

1. Submit GRE scores.
2. Complete the general university requirements (page 202).
3. Complete the Ph.D. degree requirements (page 207).
4. Complete course work in anthropology and related disciplines as determined by the advisory committee.
5. Complete one foreign language and a research tool, or two foreign languages.
6. Minimum credits required 18

ARCTIC ENGINEERING

College of Engineering and Mines
Department of Civil and Environmental Engineering
907-474-7241
www.uaf.edu/cem/cee/

M.S. Degree

Minimum Requirements for Degree: 30 credits

The arctic engineering program trains graduate engineers to deal with the challenges of design, construction and operations in cold regions of the world. Climatic, geological and logistical conditions of the Arctic and subarctic create special problems and require knowledge and techniques not usually covered in engineering courses.

A thorough understanding of heat transfer processes is of primary importance, and the properties of frozen ground and water are basic to most engineering in the Arctic. Arctic conditions also uniquely affect hydraulics, hydrology and utility operations.

Core required courses in the arctic engineering program teach engineers to understand and adapt to cold region problems. Students round out the program with advanced elective courses in a particular field of interest. Arctic engineering research carried out by faculty can provide students with opportunities for theses or project papers dealing with the most current arctic knowledge.

Development of petroleum and other natural resources has accentuated the demand for engineers who understand northern operations. Skilled engineers are needed both in private industries involved in development and within government agencies that plan and regulate development activity.

Graduate Program — M.S. Degree

1. Complete the general university requirements (page 202).
2. Complete the master's degree requirements (page 206).

3. Complete at least five of the following core courses:

CE F681—Frozen Ground Engineering	3
CE F682—Ice Engineering (3)	3
or GEOS F615—Sea Ice (3)	3
CE F683—Arctic Hydrology and Hydraulic Engineering.....	3
CE F684—Arctic Utility Distribution	3
ME F685—Arctic Heat and Mass Transfer	3
ME F687—Arctic Materials Engineering	3
 4. CE F698 or F699—Thesis or Project
 5. Electives *
 6. Minimum credits required.....
- * All electives must be in areas related to or supportive of the student's degree program and approved by the student's graduate advisory committee.
- Note: CE F603—Arctic engineering is not an approved elective for the M.S. in arctic engineering.
- See Civil Engineering.
 See Engineering for Ph.D. program.
 See Engineering Management.
 See Environmental Engineering and Environmental Quality Science.
 See Science Management.

ART

College of Liberal Arts
 Department of Art
 907-474-7530
www.uaf.edu/art/

M.F.A. Degree

Minimum Requirements for Degree: 60 credits

The M.F.A. degree provides artists with the necessary background to compete for state, national and international positions. Career opportunities include placement in state and federal arts organizations, galleries, museums, colleges and universities. This degree includes exposure to contemporary art world issues, the historic role of the artist and northern art. The M.F.A. degree in visual art is a terminal degree. Study is two-thirds in studio art. The degree culminates in a solo gallery exhibition.

Graduate Program — M.F.A. Degree

Concentrations: Ceramics, Computer Art, Drawing, Native Arts, Painting, Photography, Printmaking, Sculpture

1. Complete the following admission requirements:
 - a. Submit a separate portfolio of work (about 20 slides or the appropriate equivalent depending on field of study).
 - b. Complete a B.F.A. degree from a university other than UAF, or complete one consecutive year of classes from an accredited M.F.A. program other than UAF. In cases where an exceptional portfolio is submitted, students with a B.A. in art, or other undergraduate degree, will be accepted provisionally and with the condition that they make up any deficiencies as determined by their graduate committee. The same requirements are observed with the determination of previous schooling from a university other than UAF.
2. Complete the master's degree requirements (page 206).
3. Complete the following:

ART F661—Mentored Teaching in Art.....	1
ART F663—Seminar in Art History	3
ART F690—Current Problems	3
ART F698—MFA Project* (5)	5
or ART F699—MFA Thesis* (5).....	5
Electives in art history, humanities or philosophy**.....	6

4. Complete at least two studio areas at the F600-level***
 5. Minimum credits required.....
- * Studio with 2 hour oral comprehensive examination
- ** The F400-level classes in these areas can be taken with additional requirements. Courses may be chosen from the following: ART F624, F625, F663 and F673.
- *** Courses may be chosen from the following: ART F601, F607, F611, F613, F619, F672, F684, JRN F605.

Note: Graduate students are required to be enrolled in a mentored teaching section while teaching.

ATMOSPHERIC SCIENCES

College of Natural Science and Mathematics
 Department of Atmospheric Sciences
 907-474-7368
www.uaf.edu/asp/

M.S., Ph.D. Degrees

Minimum Requirements for Degrees: M.S.: 30 credits;
 Ph.D.: 18 thesis credits

The field of atmospheric science covers a wide variety of disciplines involving the physical and chemical properties and processes of the atmosphere. Emerging trends in atmospheric science stress the interactions of the atmosphere with other components (i.e. land, sea ice, ocean) in the total earth system.

The UAF Geophysical Institute, the International Arctic Research Center and other university research institutes support active research programs in high-latitude atmospheric science that include faculty from the biology, chemistry, physics and other departments. Current research by atmospheric sciences focuses on: atmospheric chemistry/biogeochemistry, climate modeling, cloud and aerosol physics, mesoscale modeling, numerical weather prediction and aviation weather. In addition, scientists affiliated with the research institutes conduct research on ocean-atmosphere interactions, dynamic meteorology, microclimatology, polar meteorology, radiative transfer, cryosphere-atmosphere interactions and remote sensing.

Graduate students are an integral component of this research, both in the laboratory and the field. Research institutes provide excellent environments for research in atmospheric science as well as interdisciplinary research with scientists in other research areas.

Graduate Program — M.S. Degree

1. Complete the general university requirements (page 202).
2. Complete the master's degree requirements (page 206).
3. Complete four of the five following basic courses in atmospheric sciences:

ATM F601—Introduction to Atmospheric Science	3
ATM F606—Atmospheric Chemistry.....	3
ATM F613—Atmospheric Radiation	3
ATM F615—Cloud Physics.....	3
ATM F645—Atmospheric Dynamics	3
4. Complete additional approved F600-level courses
5. Complete ATM F699—Thesis
6. Minimum credits required.....

Graduate Program — Ph.D. Degree

1. Complete the general university requirements (page 202).
2. Complete the Ph.D. degree requirements (page 207).
3. Complete the following basic courses in atmospheric sciences:

ATM F601—Introduction to Atmospheric Science	3
ATM F606—Atmospheric Chemistry.....	3
ATM F613—Atmospheric Radiation	3

- ATM F615—Cloud Physics 3
 ATM F645—Atmospheric Dynamics 3
- Complete the additional course requirements determined in conjunction with the graduate advisory committee.
 - Minimum credits required 18

BIOCHEMISTRY AND MOLECULAR BIOLOGY

College of Natural Science and Mathematics
 Department of Chemistry and Biochemistry
 907-474-5510
www.uaf.edu/chem/

M.S., Ph.D. Degrees

Minimum Requirements for Degrees: M.S.: 30 credits;
 Ph.D.: 18 thesis credits

Biochemistry and molecular biology is an interdepartmental program administered by the Department of Chemistry and Biochemistry with research support through the Institute of Arctic Biology. A broad range of biomedical research experiences are available including molecular and cellular neuroscience, proteomics, protein structure-function and molecular toxicology. The arctic environment provides additional research opportunities in environmental biochemistry, adaptations and molecular genetics.

UAF faculty and affiliate faculty at collaborating institutions provide a rich academic environment encompassing both research and comprehensive course offerings. Students with career interests in biotechnology, pharmaceutical sciences, environmental health, genetics and biomedicine are encouraged to apply. Students are normally accepted with financial support (fellowships, research assistantships and/or teaching assistantships) along with tuition waivers.

Graduate Program — M.S. Degree

- Complete the general university requirements (page 202).
- Complete the master's degree requirements (page 206).
- Complete the following:
 CHEM F654—Protein Structure and Function 3
 CHEM F657—Molecular Foundations of Gene Expression 3
 CHEM F674—Membrane Biochemistry and Biophysics 3
- Complete a research thesis.
- Minimum credits required 30

Graduate Program — M.S. Degree with Neuroscience Option

- Complete the general university requirements (page 202).
- Complete the master's degree requirements (page 206).
- Complete the following:
 CHEM F654—Protein Structure and Function 3
 CHEM F657—Molecular Foundations of Gene Expression 3
 CHEM F674—Membrane Biochemistry and Biophysics 3
- Complete the following:
 BIOL F617—Neurobiology 3
- Complete a neuroscience research thesis
- Minimum credits required 30

Graduate Program — Ph.D. Degree

- Complete the general university requirements (page 202).
- Complete the Ph.D. degree requirements (page 207).
- Complete the following:
 CHEM F654—Protein Structure and Function 3
 CHEM F657—Molecular Foundations of Gene Expression 3
 CHEM F674—Membrane Biochemistry and Biophysics 3

- Complete three electives.
- Complete Ph.D. dissertation.
- Complete two seminar series (CHEM F692).
- Minimum credits required (including core courses) 38

Graduate Program — Ph.D. Degree with Neuroscience Option

- Complete the general university requirements (page 202).
- Complete the Ph.D. degree requirements (page 207).
- Complete the following:
 CHEM F654—Protein Structure and Function 3
 CHEM F657—Molecular Foundations of Gene Expression 3
 CHEM F674—Membrane Biochemistry and Biophysics 3
- Complete three electives with two of the electives in neurosciences.
- Complete Ph.D. dissertation in a field of neuroscience.
- Complete two seminar series (CHEM F692).
- Minimum credits required (including core courses) 38

BIOLOGICAL SCIENCES

College of Natural Science and Mathematics
 Department of Biology and Wildlife
 907-474-7671
www.bw.uaf.edu

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

Minimum Requirements for Degrees: M.S.: 30 credits;
 M.A.T.: 36 credits; Ph.D.: 18 thesis credits

UAF biological sciences graduate students have extraordinary opportunities to conduct independent biological research in controlled-experiment or field settings, taking advantage of arctic, alpine and boreal environments near campus or at remote locations.

The department has close connections with the National Science Foundation taiga Long Term Ecological Research site, located about 20 miles from campus. Our students also have access to the tundra LTER site at Toolik Lake, where the UAF Institute of Arctic Biology runs a field station.

Facilities available to graduate students on the Fairbanks campus include small mammal colonies, the Large Animal Research Station, both electron and light microscope laboratories, an imaging laboratory and a greenhouse facility. Students and faculty work on systematic collections in the UA Museum of the North using a variety of approaches from traditional morphology to molecular biology.

The program has strong research emphases in arctic plant ecology, plant-animal coevolution, insect ecology (terrestrial and aquatic), bird and mammal physiological ecology, vertebrate population dynamics, biology of seabirds, molecular evolution and systematics, pollution ecology, wetland ecology, population genetics, ungulate biology and wildlife management.

Advanced degree recipients gain significant teaching experience conducting labs, and a few take primary responsibility for instruction in a course at the undergraduate level. Our graduates have pursued careers in education at the university, community college and secondary levels. Many find professional positions with state and federal resource agencies, with whom the department faculty maintain close contact.

The Department of Biology and Wildlife has approximately 100 graduate students. The atmosphere is informal and students and faculty interact frequently, not only in small-enrollment classes, but also on field trips and in community and social settings.

Research assistantships are available on a competitive basis. Teaching assistantships in department courses provide excellent experience. Competitive fellowships are available through the UAF Graduate School. Applicants interested in graduate assistantships should contact the department for assistantship application forms.

Graduate Program — M.S. Degree

- Complete the admission process including the following:
 - Submit scores from both the GRE General Test (required) and the GRE Subject Test in Biology (highly recommended).
 - If English is not your native language, submit scores from both the Test of Spoken English and the Test of Written English, as well as TOEFL scores. Requests, including justification, for exceptions to this requirement should be made to the chair of the department.
- Complete the general university requirements (page 202).
- Complete the M.S. — with Thesis degree requirements (page 208).
- As part of the M.S. degree requirements, complete and pass the departmental written and oral master's comprehensive examination.
- Minimum credits required 30

Graduate Program — M.A.T. Degree

- Complete the admission process including the following:
 - Submit scores from both the GRE General Test (required) and the GRE subject Test in Biology (highly recommended).
 - If English is not your native language, submit scores from both the Test of Spoken English and the Test of Written English, as well as TOEFL scores. Requests, including justification, for exceptions to this requirement should be made to the chair of the department.
- Complete the general university requirements (page 202).
- Complete the M.A.T. degree requirements (page 208).
- Minimum credits required 36

Note: Persons interested in this degree program should contact the department chair.

Graduate Program — Ph.D. Degree

Concentration: Wildlife Biology and Conservation

- Complete the admission process including the following:
 - Submit scores from both the GRE General Test (required) and the GRE Subject Test in Biology (required for applicants holding only a bachelor's degree; highly recommended for applicants who have already earned a master's degree).
 - If English is not your native language, submit scores from both the Test of Spoken English and the Test of Written English, as well as TOEFL scores. Requests, including justification, for exceptions to this requirement should be made to the chair of the department.
- Complete the general university requirements (page 202).
- Complete the Ph.D. degree requirements (page 207).
- As part of the Ph.D. degree requirement, complete the following:
 - If entering with only a bachelor's degree, complete and pass the departmental written and oral Ph.D. qualifying examination.
 - Complete and pass a written and oral comprehensive examination by the graduate advisory committee.
 - In this program or in previous post-baccalaureate programs, complete course work at least equivalent to that required for the M.S. degree.
- Minimum credits required 18
See Wildlife Biology and Conservation.

BUSINESS ADMINISTRATION

School of Management
907-474-4622
www.uaf.edu/som/programs/mba/

M.B.A. Degree

Minimum Requirements for Degree: 30 credits

The School of Management offers professional education applicable to the fields of management, finance, human resource management, international business, marketing and travel industry management to individuals interested in entering industry or government.

The program prepares graduates to meet the complex problems of the technical, economic and social environment and to enable them to provide imaginative and responsible leadership to industry and government.

The UAF program recognizes that competence in the practice of management necessitates education with both breadth and depth. The graduate program is accredited by the Association to Advance Collegiate Schools of Business.

Graduate Program — M.B.A. Degree

Concentrations: Capital Markets, General Management

- Complete the admission process including the following:
 - Applications will be reviewed on a continuous basis
 - UAF B.B.A. students may be admitted to the M.B.A. program prior to graduating if they meet one of the following:
 - Have at least a B grade in BA F325, BA F343, BA F360, BA F390 and ECON F227
 - have senior standing and an overall GPA of 3.25 or have at least a B grade in BA F325, BA F343, BA F360, BA F390 and ECON F227
 - have senior standing, an overall GPA of 3.0 and a minimum GMAT score of 500 (an average GRE score of 500 will also be accepted)
 - Non-UAF applicants with a bachelor's degree with a business major from an AACSB-accredited institution and a 3.25 GPA will be admitted without taking the GMAT or GRE. Other applicants must submit results from the GMAT or GRE.
 - Students with a graduate degree from an accredited institution will be admitted without taking the GMAT or GRE.
- Complete the general university requirements (page 202).
- Complete the master's degree requirements (page 206).
- If a student earns grades of two Cs, one D, or one F in courses that are part of his/her M.B.A. program, the student will no longer be in good standing in the M.B.A. program even if his/her cumulative GPA remains at or above 3.0. M.B.A. Students who are not in good standing will be subject to review and may be dismissed by the M.B.A. committee. Students may not use more than two F600-level courses with C grades on their Advancement to Candidacy application. An A or B grade must be earned in F400-level courses.
- Complete the following foundation courses if previous college work is not in business:

MBA F602—Accounting for Managers	3
MBA F652—Fundamentals of Business.....	3
MBA F621—Fundamentals of Economics	3
MBA F628—Analytical Methods for Economics and Business	3
- Complete the following advanced M.B.A. core courses after all foundation course requirements (part 5) are completed:

MBA F617—Organizational Theory for Managers	3
MBA F643—Marketing Management	3

- MBA F675—Quantitative Methods for Managers..... 3
 MBA F680—Financial Markets and Strategy 3
7. Complete the following capstone course:
 MBA F690—Corporate Strategy 3
8. Complete one of the following concentrations:*
- Capital Markets**
- a. Complete three of the following:
 MBA F605—Contemporary Topics in Accounting 3
 MBA F620—Portfolio Theory and Asset Pricing..... 3
 MBA F630—Derivative Securities 3
 MBA F681—Fixed Income Securities and Markets..... 3
 MBA F682—Financial Statement Analysis..... 3
- b. Complete two approved electives at the F400- or F600-level..... 6
- c. Minimum credits required 30
- General Management**
- a. Complete three of the following:
 MBA F605—Contemporary Topics in Accounting 3
 MBA F673—Technology Management 3
 MBA F607—Human Resources Management..... 3
 MBA F682—Financial Statements Analysis 3
 MBA F683—Advanced Topics in Marketing 3
 MBA F691—Advanced Topics in Business 3
- b. Complete two approved electives at the F400- or F600-level..... 6
9. Minimum credits required 30
- * Both concentrations may be earned for degree; however, courses used in one concentration may not be used to meet requirements in the other concentration.

CHEMISTRY

College of Natural Science and Mathematics
 Department of Chemistry and Biochemistry
 907-474-5510
www.uaf.edu/chem/

M.A., M.S. Degrees

Minimum Requirements for Degrees: 30 credits

Graduates in chemistry qualify for employment in many fields as teachers of chemistry; supervisors in industry; technical sales personnel; research chemists in federal, state, municipal, academic or industrial laboratories; in pre-medicine; and as laboratory technicians. The rapid introduction of chemical techniques in all branches of commerce and the creation of many synthetic products have caused substantial growth in the profession. In addition to the traditional employment opportunities in chemistry, well-qualified graduates find positions in the fields of environmental sciences, oceanography and related interdisciplinary fields. Many recipients of chemistry master's degrees continue their education to obtain Ph.D. degrees at other universities.

The department offers well-equipped laboratories housing instrumentation for nuclear magnetic resonance spectrometry, infrared, ultraviolet/visible, and atomic absorption spectrophotometry, mass spectrometry, gas chromatography, amino acid analysis and HPLC. Additional equipment for gas chromatography/mass spectrometry, x-ray diffractometry, electron microscopy and liquid scintillating counters is available in cooperation with other UAF departments and institutes.

Graduate Program — M.A. Degree*

1. Complete the requirements for the M.S. degree in chemistry.
 * This is a non-thesis degree program. Substitute a research project (CHEM F698) for thesis.

Graduate Program — M.S. Degree

- Complete the general university requirements (page 202).
- Complete the master's degree requirements (page 206).
- Complete a research-based thesis.
- Complete seminar..... 2
- Complete at least one semester of assisting in an undergraduate chemistry laboratory.
- Minimum credits required 30
 See Biochemistry and Molecular Biology.
 See Environmental Chemistry.

CIVIL ENGINEERING

College of Engineering and Mines
 Department of Civil and Environmental Engineering
 907-474-7241
www.uaf.edu/cem/cee/

M.C.E., M.S. Degrees

Minimum Requirements for Degrees: 30 credits

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

Civil engineers use sophisticated technology and employ computer-aided engineering during project phases of design, construction, project scheduling and cost control. Civil engineers are problem solvers involved in community development and improvement. They meet the challenges of pollution, deteriorating infrastructure, traffic congestion, energy needs, floods, earthquakes, urban redevelopment and community planning. The opportunity for creativity is unlimited.

The civil engineering program at UAF began in 1922, had its first graduate in 1931 and since has graduated more than 800 men and women. Many of these graduates work in Alaska's cities, towns and villages in a wide range of responsible positions. More than 60 percent of Alaska's professional engineers practice in civil engineering. The UAF civil engineering program has been accredited since 1940 by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. All engineering programs in the department give special attention to problems of northern regions.

Graduate students may enter one of two programs: the master of civil engineering is for those whose goal is broad professional practice. Those whose interests or background favor a specialized program, with emphasis on research and/or advanced specialized study, will ordinarily select the master of science degree.

In addition to general civil engineering courses, specialties are available in transportation, geotechnical, structures, water resources, hydrology and environmental studies. These courses emphasize principles of analysis, planning and engineering design in northern regions.

A master's degree program can include courses in environmental engineering, engineering management and other areas. An advanced degree in environmental engineering, administered within the civil engineering department, is available.

Graduate Program — M.C.E. Degree

1. Complete the following admission requirements:
 - a. Complete a bachelor's degree in civil engineering.
 - b. International students must complete the TOEFL with a score of 575 or better.
 2. Complete the general university requirements (page 202).
 3. Complete the master's degree requirements (page 206).
 4. Complete a project..... 3 – 6
 5. Minimum credits required..... 30
- Note: M.C.E. candidates will have passed a fundamentals of engineering examination prior to the awarding of the degree.*

Graduate Program — M.S. Degree

1. Complete the following admission requirements:
 - a. Complete a bachelor's degree in civil engineering.
 - b. International students must complete the TOEFL with a score of 575 or better.
 2. Complete the general university requirements (page 202).
 3. Complete the master's degree requirements (page 206).
 4. Complete a thesis..... 6 – 12
 5. Minimum credits required..... 30
- See Arctic Engineering.
See Engineering for Ph.D. program.
See Engineering Management.
See Science Management.
See Environmental Engineering and Environmental Quality Science.

COMMUNICATION, PROFESSIONAL

College of Liberal Arts
Department of Communication
907-474-6591
www.uaf.edu/comm/

M.A. Degree

Minimum Requirements for Degree: 30 – 34 credits

The communication program prepares students to handle the challenges of communicating effectively and ethically in a rapidly changing world characterized by diversity in gender, cultural background and belief.

The M.A. in professional communication provides advanced education for individuals in or pursuing communication related careers in public/nonprofit organizations, media organizations, health care organizations or in higher education. Students take courses that focus on organizational communication theory and practices.

The program is both theoretically and pragmatically oriented to prepare students for the professional workplace or for doctoral study in organizations.

Graduate Program — M.A. Degree

1. Complete the following additional admission requirement:
Submit academic writing sample.
2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206).
4. Complete the following:
 - a. COMM F600—Introduction to Professional Communication..... 3
 - COMM F601—Communication Research Methodologies (Social Science)..... 3

- COMM F602—Communication Research Methodologies (Human Science)..... 3
- COMM F625—Communication Theory..... 3
- COMM F675—Training and Development Communication..... 3
- COMM F680—Communication and Diversity in the Professional World 3
- COMM F699—Thesis..... 6
- b. Complete two of the following electives:*
- COMM F622—Interpersonal Interaction..... 3
- COMM F631—Teambuilding..... 3
- COMM F635—Organizational Culture and Communication..... 3
- COMM F642—Health Communication 3
- COMM F682—Seminar in Communication 3

- c. Teaching assistants complete the following:
COMM F661—Mentored Teaching in Communication** 1 – 4

5. Minimum credits required..... 30 – 34

* Students may take F400- and F600-level courses in art, education, English, journalism, communication, marketing, business administration and northern studies as well as graduate level independent studies to fulfill 6 credits of the elective requirement, if approved by the student's committee. Students will also be able to apply up to 6 credits of appropriate graduate level course work from other universities in the elective area if approved by the student's committee.

** This 1 credit course may be taken up to four times.

Note: A maximum of 6 credits of approved F400-level courses may be included in the 30 – 34 credit requirement.

Note: The comprehensive examination is to be taken no later than the student's fourth semester of work.

COMPUTER SCIENCE

College of Engineering and Mines
Department of Computer Science
907-474-2777
www.cs.uaf.edu

M.S. Degree

Minimum Requirements for Degree: 30 credits

Computer science is the study of information handling and its application to the problems of the world. Computing is widely used in support of activities in science, engineering, business, law, medicine, education and the social sciences.

The M.S. degree follows the recommendations of the Association for Computing Machinery and the Institute for Electrical and Electronic Engineers. The program provides breadth and depth in course work and culminates with a major unifying project. This program is available to students who have completed a B.S. degree in computer science at most institutions. Students from other universities who have completed a substantial portion of a bachelor's level computer science program may be admitted to the M.S. program. In such cases, undergraduate courses may be required to remedy deficiencies.

For admission to the M.S. computer science program, the GRE general and computer science subject exam is required.

Graduate Program — M.S. Degree

1. Complete the UAF admission process including the following:
 - a. Submit GRE general and computer science subject exam scores.
 - b. For teaching assistantship consideration, foreign applicants whose native language is not English must submit a TOEFL score of at least 600.
 - c. The department gives preference to applicants who also submit results of the Test of Spoken English.
2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206).

4. Complete the following:

CS F611—Complexity of Algorithms	3
CS F631—Programming Language Implementation.....	3
CS F641—Advanced Systems Architecture	3
CS F671—Advanced Software Engineering.....	3
CS F690—Graduate Seminar and Project	3
CS F691—Graduate Seminar and Project.....	3
Approved electives.....	12
5. Minimum credits required..... 30

CONSTRUCTION MANAGEMENT

College of Engineering and Mines
 Department of Civil and Environmental Engineering
 907-474-7241
www.uaf.edu/cem/cee/

Graduate Certificate

Minimum Requirements for Certificate: 15 credits

The graduate certificate in construction management is designed to advance the managerial skills and decision-making abilities of engineers and other professionals in the construction industry. The program was designed in collaboration with construction industry employers and continues to engage industry as a partner in the program. Engineers and other construction professionals will enhance their skills to help prepare them for more responsible jobs and help them advance to more responsible management positions.

The program permits flexibility of course selection within the major rubrics: human relations, communications, construction project management and technical construction areas.

Graduate Program — Graduate Certificate

1. Complete the following admission requirements:
 - a. A four-year ABET college degree in engineering and at least two years' construction management experience;
 or a four-year non-ABET college degree in engineering, science or mathematics and at least four years construction experience;
 or a four-year college degree and at least six years construction experience;
 or at least 10 years construction management experience.
2. Complete the general university requirements (page 202), and
 - a. The student must enroll in one course per year to remain in good standing.
 - b. The graduate advisory committee will be a construction management certificate faculty member or faculty committee as appointed by the dean of CEM.
 - c. The student will complete a graduate study plan after completing 5 credits.
3. Complete the graduate certificate requirements (page 206).
4. Complete 15 credits from three main construction management rubrics and two associated rubrics as approved by the student's advisory committee.
 - a. Human relations and communication

BA F607—Human Resources Management (3) or ESM F601—Managing and Leading Engineering Organizations (3) or other approved human relations courses	4 – 6
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 - b. Construction project management and scheduling

CE F620—Civil Engineering Construction (3) or ESM F609—Project Management (3) or ESM F608—Legal Principles for Engineering Management (3) or other approved construction project management courses	4 – 6
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- c. Technical management of construction and costs

CE F451—Construction Cost Estimation and Bid Preparation (3) or CE F603—Arctic Engineering (3) or ESM F622 —Engineering Decisions (3) or other approved technical management of construction and costs courses	4 – 6
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- d. Business and Financial aspects of construction

ACCT F602—Accounting for Managers (3) or ESM F605—Engineering Economics (3).....	0 – 3
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- e. Other technical areas

CE F603—Arctic Engineering (3) or ENVE F644 —Environmental Laws and Permitting (3).....	0 – 3
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5. Minimum credits required..... 15

COUNSELING

School of Education
 907-474-7341
www.uaf.edu/educ/graduate/counseling/

M.Ed. Degree

Minimum Requirements for Degree: 48 – 54 credits

The University of Alaska Graduate Counseling Program prepares students to become culturally responsive effective practitioners through coursework and supervised internship experiences that emphasize an ecological perspective. Students who complete the School Counseling track, a 48 credit-hour program, are eligible to be licensed as professional school counselors in the state of Alaska. Students who complete the Community Counseling track, a 54 credit-hour program, are eligible for licensure as mental health counselors, with additional post-degree requirements. Students who complete this track are eligible to work in community/mental health agencies or as private clinicians once licensed. Students who are completing either program track through distance education are required to complete COUN F634—Practicum in Individual Counseling and COUN F674—Group Counseling on the Fairbanks campus. These courses are offered in alternating summers.

Graduate Program — M.Ed. Degree

1. Complete the following admission requirements:
 - a. Applications will be reviewed on March 1 for admission to the fall semester.
 - b. Admission requires a bachelor's degree in a human service area such as education, social work, psychology, human services, etc. Suitability of other degrees will be considered on an individual basis by counseling faculty.
 - c. Applicants must have a GPA of 3.0 or higher in their undergraduate degree or take the Graduate Record Exam.
2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206).
4. Complete internship placements appropriate to the student's declared area of interest.
5. Complete the following:

COUN F615—Foundations of Counseling.....	3
COUN F623—Counseling Theories and Applications I.....	3
COUN F627—Developmental Interventions* (3) or COUN F629—Counseling Interventions for Adults.....	3
COUN F628—Child and Adolescent Development	3
COUN F632—Career Development.....	3
COUN F630—Appraisal for Counselors	3

COUN F634—Practicum in Individual Counseling	3
COUN F636—Internship I**	3
COUN F647—Professional Ethics	3
COUN F660—Cross-Cultural Counseling	3
COUN F674—Group Counseling	3
COUN F686—Internship II**	3
COUN F698—Research Project (3 – 6) or COUN F699—Thesis (6)	3 – 6
ED F601—Introduction to Applied Social Science Research	3
6. Complete the following classes for school counseling track: COUN F646—School Counseling	3
Elective credits	3
7. Complete the following classes for K – 12 school counseling track (elementary and secondary): COUN F646—School Counseling	3
COUN F687—Internship III**	3
COUN F688—Internship IV**	3
Elective credits	3
8. Complete the following classes for community counseling track: COUN F638—Advanced Lifespan Development	3
COUN F650—Cross Cultural Psychopathology	3
COUN F666—Family and Network Therapy	3
COUN F687—Internship III**	3
9. Minimum credits required	48 – 54
* School Counseling students must complete COUN F627—Developmental Interventions.	
** Additional fee required. Charges are added to fee statements each semester.	
Note: Courses assigned by the student's graduate committee to remove deficiencies will not be allowed as part of the graduate program.	

School Counselor Certification Program

- Complete the following admission requirements:
 - Application to the licensure only program follows the same admission requirements and procedures as for the M.Ed. in counseling.
 - People who currently hold master's degrees in education or one of several helping professions such as social work, psychology, or human services (as approved by counseling faculty) may apply.
 - Complete the following requirements for certification in one level (Elementary or Secondary):

COUN F615—Foundations of Counseling	3
COUN F623—Counseling Theories and Applications I	3
COUN F627—Developmental Interventions	3
COUN F628—Child and Adolescent Development	3
COUN F632—Career Development	3
COUN F630—Appraisal for Counselors	3
COUN F634—Practicum in Individual Counseling	3
COUN F636—Internship I**	3
COUN F646—School Counseling	3
COUN F647—Professional Ethics	3
COUN F660—Cross-Cultural Counseling	3
COUN F674—Group Counseling	3
COUN F686—Internship II**	3
 - Complete the following additional classes for K-12 school counseling certification (Elementary and Secondary):

COUN F687—Internship III**	3
COUN F688—Internship IV**	3
 - Minimum credits required
- ** Additional fee required. Charges are added to fee statements each semester. Students must take 15 UAF credits. Up to 30 graduate transfer credits from a previous degree program may be applied, as approved by the School of Education counseling program.

CROSS-CULTURAL STUDIES

College of Liberal Arts
Center for Cross-Cultural Studies
907-474-1902
www.uaf.edu/cxcs/

M.A. Degree

Minimum Requirements for Degree: 36 credits

The cross-cultural studies M.A. degree program emphasizes indigenous knowledge systems. The program is designed to provide graduate students from various fields of interest an opportunity to pursue in-depth study of the role and contributions of indigenous knowledge in the contemporary world. Students are expected to demonstrate the ability to work effectively with indigenous people in their studies.

Graduate Program — M.A. Degree

- Complete the general university requirements (page 202).
- Complete the master's degree requirements (page 206).
- Complete at least 6 credits in a field setting, including minimum of one week camp with elders.
- Complete at least 36 semester hours beyond the bachelor's degree level. (Students may transfer a maximum of 9 hours from another university into their program.)
- Complete at least 30 of the 36 semester hours at the F600-level.
- Satisfactorily complete a comprehensive examination.
- Complete the following core courses:

CCS F601—Documenting Indigenous Knowledge	3
CCS F608—Indigenous Knowledge Systems	3
CCS F612—Traditional Ecological Knowledge	3
CCS/ED F690—Seminar in Cross-Cultural Studies	3
- Complete at least one of the following cross-cultural studies specialization courses:

ANS/ED F461—Native Ways of Knowing	3
CCS/ED F610—Education and Cultural Processes	3
RD F425—Cultural Impact Analysis	3
- Complete a minimum of 15 credits of approved electives to provide specialization depth. Example of approved electives include the following:

ANS F475—Alaska Native Social Change	3
CCS F602—Cultural and Intellectual Property Rights	3
CCS/ED F603—Field Study Research Methods	3
CCS/ED F611—Cultural, Cognition and Knowledge Acquisition	3
CCS/ED F613—Alaska Standards for Culturally Responsive Schools	3
- Complete CCS F698—Field Study/Elder Apprenticeship
- Minimum credits required

ECONOMICS, RESOURCE AND APPLIED

School of Management
Department of Economics
907-474-7461
www.uaf.edu/som/programs/msecon/

M.S. Degree

Minimum Requirements for Degree: 30 – 33 credits

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

The economics department offers study leading to the M.S. degree in resource and applied economics. The resource economics program offers a specialization in the economics of natural resources with emphasis in a variety of specific fields possible through interdisciplinary elective courses and thesis research. These might include fisheries, wildlife management, land resources management, agriculture, oil and minerals, water resources or forest management.

The program consists of core course work in micro- and macro-economic theory, mathematical economics, economic methods and courses in the economic theory and public policy of natural resources. Master's candidates may select a thesis or non-thesis option. Thesis topics, consistent with students' interest and project requirements, may be selected from current research projects of the department or from one of the several research institutes on campus. Most research projects deal with issues pertinent to the development and management of Alaska's renewable and nonrenewable resources.

Graduate Program — M.S. Degree

1. Complete the general university requirements (page 202).
2. Complete the master's degree requirements (page 206).
3. Students may be accepted into the program subject to identified deficiencies being rectified. Unconditional acceptance into the program requires completion of intermediate microeconomics and macroeconomics, basic statistics and one semester of calculus.
4. Complete the following:

ECON F601—Microeconomic Theory I.....	3
ECON F603—Macroeconomic Theory.....	3
ECON F623—Mathematical Economics.....	3
ECON F626—Econometrics.....	3
ECON F635—Renewable Resource Economics.....	3
ECON F636—Non-Renewable Resource Economics.....	3
5. Complete the thesis or non-thesis requirements:

Thesis*

- a. Complete the following:

ECON F699—Thesis.....	6
Electives.....	6
- b. Minimum credits required.....30

Non-Thesis*

- a. Complete the following:

ECON F698—Project.....	3
Electives at the F600-level.....	6
Electives.....	6
- b. Minimum credits required.....33

* Complete at least 25 credits at the F600-level.

EDUCATION

School of Education
907-474-7341
www.uaf.edu/educ/

M.Ed. Degree and Post-Baccalaureate Licensures

Minimum Requirements for Art K – 12 Licensure: 34 credits;
Elementary Post-Baccalaureate Licensure: 35 – 39 credits;
Secondary Post-Baccalaureate Licensure: 31 credits;
Special Education K – 12 Post-Baccalaureate Licensure Program
Certificate of Completion: 24 – 27 credits; M.Ed.: 30 credits

The University of Alaska Fairbanks complies fully with the institutional reporting requirements mandated in Title II of the Higher Education Act Amendments of 1998. Please contact the School of Education for a copy of the complete report.

The UAF School of Education prepares students from across Alaska, as well as from other states and nations, to work in urban and rural Alaska and to work with multicultural and minority — especially Alaska Native — students. To fulfill our commitment to enhancing educational opportunities for the state's rural and Native populations, faculty actively and knowledgeably utilize educational technology to deliver all School of Education programs to students in most areas of the state.

The School of Education offers programs in elementary education, secondary education, counseling, curriculum and instruction, and reading at both the post-baccalaureate and master of education degree levels. During their internships, candidates pay an additional fee. Charges are added to fee statements each semester.

The UAF School of Education is approved by the Alaska Department of Education and Early Development to recommend its students for Alaska licensure as elementary and secondary teachers and school counselors. Courses are available on-site and by distance delivery through the Kuskokwim, Bristol Bay, Interior-Aleutians, Chukchi, and Northwest campuses, as well as on the Fairbanks campus. Faculty research in cross-cultural studies, curriculum and instruction, language and literacy, and small rural schools support the mission of the School of Education.

Priority for enrollment in field-based courses is given to rural students formally admitted to degree and licensure programs. All inquiries should be addressed to one of the rural campuses or to the School of Education's Student Services office.

Candidates for elementary and secondary licensures are required to have use of/own a laptop computer before enrolling in the fall semester. This computer may be of any type but must have capacities that enable the candidate to meet School of Education requirements. Candidates enrolled in School of Education courses at any level (with the exception of 500 level professional development courses) are eligible to purchase a Macintosh laptop computer at a special discount through the School of Education.

Licensure Information

UAF education programs are approved by the Alaska State Board of Education standards and accredited by the National Council for the Accreditation of Teacher Education. For information about these programs contact one of the School of Education academic advisors.

The state of Alaska requires that all initial applicants for a teaching certificate provide evidence of passing Alaska qualifying scores on the Praxis I; Academic Skills Assessment including the Pre-Professional Skills Test and/or the Computer-Based Academic Skills Assessment. For additional information, visit the website of the State Department of Education and Early Development at www.eed.state.ak.us/TeacherCertification/.

Art K – 12 Licensure Program toward M.Ed., Secondary Education

Offered on the Fairbanks campus only, this is an intensive, classroom-based K – 12 art licensure program (34 credits) that prepares post-baccalaureate candidates for K – 12 teaching positions. The program is specifically designed to prepare candidates to teach in multicultural settings in Alaska. The content will specifically identify and discuss current issues of art education and applying Alaska content/performance standards and frameworks as well as national standards for art education.

Candidates who apply as graduate applicants may simultaneously pursue teacher licensure and the M.Ed. secondary education degree. Significant additional course work will be required. (See requirements for M.Ed. secondary education.)

At the end of the program, if students have successfully met all of the program requirements, they will be eligible to apply for an Alaska initial teaching license and will receive certificates of completion from UAF.

Candidates who enter the K – 12 Art Licensure program are required to have use of/own a laptop computer before they begin their internships in the fall semester of their professional year.

For program options and professional field experiences information, please see information listed in the catalog (page 221) for the secondary post-baccalaureate licensure program.

Admission to the secondary post-baccalaureate licensure program toward M.Ed. in secondary education includes meeting requirements of the UAF Graduate School and the School of Education. Candidates take five of the licensure courses at the F600-level.

Admission Process and Requirements

Applicants will follow the admission process and requirements listed in the catalog (page 220) for the secondary post-baccalaureate licensure program, with the exception that applicants must have a bachelor's degree in art from an accredited university or college. Applicants should be aware that additional content course work may be required, depending on content of degree. Additional course work, as determined by the appropriate departments, may mean a delay of program admission until requirements are fulfilled.

Program Requirements

1. Complete the following:
 - a. EDSC F415—Foundations of Modern Educational Practices (3)
or EDSE F205—Introduction to Secondary Education..... 3
EDSC F614—Learning, Development and Special Needs
Instruction (3)
or EDSE F622—Curriculum and Strategies II: High
Incidence (3)
or EDSE F482—Inclusive Classrooms for All Children..... 3
PSY F240—Lifespan Development (3)
or (preferred) PSY F245—Child Development (3) 3
 - b. EDSC F402—Methods of Teaching in the Secondary School..... 3
EDSC F636—Secondary Art Instruction and Assessment 3
ED F453/ART F459—Secondary Internship 3
EDSC F658—Classroom Organization and Management 3
 - c. ED F649—Elementary Art Methods..... 3
ED F452/ART F458—Elementary Internship 3
EDSC F657—Multicultural Education and
School-Community Relations 4
EDSC F642—Technology Applications in Education 3
2. Minimum credits required 34

Elementary (K – 8) Post-Baccalaureate Licensure Program

This program is offered in Fairbanks and College of Rural and Community Development campus service areas. The elementary teacher post-baccalaureate program is an intensive, year-long program designed to provide students with the course work

and internship experience necessary to meet the Alaska Teacher Standards and be eligible for licensure as an elementary teacher in Alaska. This classroom-based program is built upon the principle of partnership — a cooperative effort between interns, mentor teachers and university faculty partners.

Students begin the program in the summer with a 9-credit block of courses. Students who complete the undergraduate courses ED F110, F201, F330, F344, and EDSE F482 can use these to fulfill the summer requirements. During the academic year of the school district, all students complete two semesters of integrated university courses and internship.

Students must apply through the Office of Admissions and the Registrar to graduate with a certificate of completion. At the end of the school year, if students have successfully met all of the program requirements, they will be eligible to apply for an Alaska Elementary License.

Elementary applicants apply as graduate-level licensure students. They may choose to complete this licensure program as part of the M.Ed. degree in elementary education. However, application to the M.Ed. degree program should be made at the beginning of elementary post-baccalaureate course work to avoid losing credits for the M.Ed. degree. (See M.Ed. elementary education options requirements.) Candidates who enter the elementary post-baccalaureate licensure program are required to have laptop computers prior to enrolling in ED F344 or F624.

Admission and Application Information

It is recommended that students submit applications before Dec. 15 to provide time to complete prerequisites if necessary. Applications will be reviewed as submitted. Deadline is Feb. 15.

Admission includes meeting both UAF graduate admissions requirements and the School of Education admissions requirements.

Graduate School Requirements:

Submit the following to the UAF Office of Admissions with a copy to the School of Education:

1. UAF Graduate application and fee.
2. Official transcript of bachelor's degree from an accredited institution and official transcripts from all institutions attended. A GPA of at least 3.0 (B grade) in undergraduate degree is required but students with less than a 3.0 may be considered for conditional admission in special circumstances.
3. Graduate Record Examination scores if undergraduate GPA is below 3.0.
4. Three letters of reference that address qualifications and potential as a teacher.
5. A vitae/resume.
6. Four-to-five-page essay indicating: reasons for wanting to become a teacher, assessment of academic and personal strengths relative to teaching, future plans and reasons for selecting the elementary post-baccalaureate program.

School of Education Requirements

Submit the following information directly to the School of Education, using School of Education forms:

1. Alaska passing scores from the Praxis I exam in reading, writing and mathematics and score from Praxis II Elementary Content exam (test 0014).
2. Completed academic analysis form to provide information on breadth and depth of prior course work relative to 10 Alaska Student Content Standard areas.
If additional course work is required, it must be completed prior to beginning the program.

3. Extemporaneous writing sample, autobiography, evidence of technology competence, evidence of successful paid or volunteer teaching/learning experience, evidence of successful cross-cultural experience.
4. Evidence of technology competence through successful completion of ED F237 or by successfully challenging each of the four components of the two-credit course.
5. Completed Alaska Department of Education and Early Development authorization packet (fingerprint cards and criminal background check necessary to work in schools). Packet is available from the School of Education.
6. Some school districts may require interns to submit a physical examination form.

Program Requirements

1. During the summer semester complete the following graduate level credits; or complete ED F110, F201, F330, F344 and EDSE F482 prior to Aug. 1 of the internship year.
ED F624—Foundations of Education in Alaska: From Segregation to Standards* 3
ED F625—Exceptional Learners and Child Development: Individual and Cultural Characteristics..... 3
ED F626—Teaching Reading, Writing and Language Arts 3
* ED F624 meets the state of Alaska requirement for an approved multicultural/cross-cultural communication course.
2. During the fall semester complete the following:
ED F411—Reading, Writing, Language Arts: Methods and Curriculum Development..... 3
ED F412W—Integrated Social Studies and Language Arts: Methods and Curriculum Development 3
ED F466—Internship and Collaborative Student Teaching..... 3
ED F467—Synthesizing the Standards I 1
ED F478/F678—Mathematics Methods and Curriculum Development..... 2
ED F479/F688—Science Methods and Curriculum Development 2
3. During the spring semester complete the following:
ED F414—Art, Music and Drama in the Elementary Classroom 2
ED F417—Physical Education and Health Education for Elementary Teachers 2
ED F468O—Internship and Student Teaching 6
ED F469—Synthesizing the Standards II..... 2
4. Minimum credits required 35

Secondary Post-Baccalaureate Licensure Program toward M.Ed., Secondary Education

Program is offered in Fairbanks and in areas served by the College of Rural and Community Development campuses and their service areas with the exception of the Aleutian-Pribilof Center.

This is an intensive, classroom-based secondary licensure program (31 credits) that prepares post-baccalaureate candidates for secondary (grades 7 – 12) teaching positions. The program is specifically designed to prepare candidates to teach in multicultural settings in Alaska. Content that addresses multicultural issues in general, and Alaska rural issues in particular, is contained specifically in EDSC F657, Multicultural Education and School-Community Relations, and is a fundamental component of the course work within the program. When funding is available, all secondary Fairbanks candidates participate in a rural practicum.

Candidates who apply as graduate applicants may simultaneously pursue teacher licensure and the M.Ed. secondary education degree. Significant additional course work will be required. (See requirements for M.Ed. secondary education option.)

Student outcomes for the program are based on the Standards for Alaska's Teachers located at: www.eed.state.ak.us/standards/pdf/teacher.pdf.

At the end of the program, if students have successfully met all of the program requirements, they will be eligible to apply for an Alaska initial teaching licenses and will receive certificates of completion from UAF.

Candidates who enter the secondary post-baccalaureate licensure program are required to have use of/own laptop computers before they begin their internships in the fall semester of their professional year.

Program Options: Fast Track, Two-Year or Teaching While Training

Fast Track Option

The Fast Track Option is an intensive three-semester program that allows candidates (one year unpaid interns) to complete the secondary licensure program as full-time students in 12 months. Candidates take class "summer-fall-spring." The academic year-long internship is completed during the fall and spring semesters.

Two-Year Option

The Two-Year Option allows candidates (two year unpaid interns) to complete the secondary post-baccalaureate licensure program as part-time students over a period of 18 – 24 months. The last semester of the program requires full-time placement at a public school site.

Teaching While Training Option

The Teaching While Training Option is for candidates (teacher interns) who have secured a teaching position with an Alaskan School District. Generally, this option is available only to those candidates in areas of teacher shortage. Candidates complete the secondary post-baccalaureate licensure program over a period of 24 months.

Admissions Process and Requirements

Admission to the secondary post-baccalaureate licensure program toward an M.Ed. in secondary education includes meeting requirements of the UAF Graduate School and of the School of Education. Candidates take five of the licensure courses at the F600-level.

Submit the following information to the UAF Office of Admissions:

1. UAF graduate application and application fee.
2. Official transcript of bachelor's degree from accredited institution. Applicants who have attended more than one university should include transcripts from all universities.
3. Graduate Record Examination scores if undergraduate GPA is less than 3.0.
4. Three current letters of reference that address qualifications and potential as a teacher.
5. A vitae/resume.
6. A personal statement of 1200 – 1500 words explaining your motivation for becoming a teacher. Describe how your academic qualifications and work experiences have prepared you for a career in teaching. Elaborate on personal strengths you possess, including your ability to work collaboratively with others. Describe your experiences with adolescents in instructional and supervisory capacities. Explain why you believe you can help young people of all cultures be successful in school.

Submit the following information to the School of Education:

1. Extemporaneous writing sample.
2. Passing scores from the Alaska Praxis I exam in reading, writing and mathematics.

3. Academic Content Testing

- a. Content area exams: Candidates must submit a score report from the relevant content knowledge Praxis II subject test for each content area the applicant expects to teach. The scores must meet the score set by the State of Alaska (www.eed.state.ak.us/TeacherCertification/pdf/Content_Area_Exams_2008.pdf). World language applicants should contact the School of Education for additional information prior to taking the Praxis II tests for their world language content area. In addition, world language applicants must complete the world language exams.
 - b. World language exams: Applicants applying to teach a world language are required to submit Praxis II scores in the target language **and** are required to submit scores for the ACTFL Oral Proficiency Interview and Writing Proficiency Test. Applicants must meet the Advanced Low rating for both tests (www.languageTesting.com). In the target language, write a 2 – 3 page, well organized, coherent response to one of three prompts (contact SOE secondary program for additional information)
4. Demonstrated evidence of content competency in one of the UAF-approved secondary endorsement areas (www.uaf.edu/educ/secondary/endorsement_areas/).
 - a. The applicant holds a degree in an approved UAF secondary endorsement area **or**;
 - b. Those applicants who do not hold a degree in the academic content area that they expect to teach, **must** have documentation of content competency reviewed by a secondary program faculty review team prior to application to program. Additional course work may be required to enter the program.
 5. Initial content preparation: complete a checklist of each content area you expect to teach (www.uaf.edu/educ/secondary/admissions/).
 6. Evidence of competence in use of technology, demonstrated by successful completion of ED F237—Technology Tools, or by passing the School of Education's computer technology competency test. Applicants who have not met this requirement by the beginning of the summer program course work will be required to complete ED F237 during the summer program.
 7. Applicants must submit a placement packet; contact the School of Education for specifics. The School of Education determines placement approval, change or termination.
 8. All applicants will be required to interview with secondary faculty as part of the admission process.

Application Review Process

Applications are due March 1 and are reviewed thereafter for admission into the summer semester. Applications of outstanding candidates may be considered through spring semester. A candidate may be admitted, not admitted, or admitted with stipulations. Stipulations are specified when additional development in a particular area(s) is needed before beginning a secondary post-baccalaureate program.

The UAF School of Education coordinates the review and evaluation of the candidate's qualifications, professional experiences and academic performance with appropriate academic departments based on the contents of his/her application. The secondary post-baccalaureate program is a selective teacher education program. A comprehensive system including multiple measures is used to assess personal characteristics, communication skills and basic skills of candidates preparing to teach. Multiple assessment measures include a review of transcripts, content area strengths and/or Praxis II scores, personal statement and/or writing proficiency exams, Praxis I and/or GRE exam scores, and letters of reference. A personal interview will be required as part of the admission process.

Upon Acceptance to the Program

The School of Education has a systematic procedure for monitoring the progress of education students from admission through completion of their professional education program to determine if they should continue the program, be advanced to the secondary teaching internship and eventually be recommended for a teaching license. In assessing candidate progress in knowledge, skills and disposition, faculty will review grades, observations, faculty recommendations, demonstrated academic competence and recommendations from the appropriate professionals in the schools. Systematic approaches are used to assist education candidates who are making unsatisfactory progress in their programs, but still maintain potential for successful completion.

The following are specific criteria for entry to the secondary teaching internship:

- successful completion of summer program courses;
- approval of faculty to enter the secondary education internship;
- some school districts may require candidates to pass a general physical exam and require additional shot records; and
- State of Alaska Certificate of Authorization, fingerprint cards and money order in the amount of \$66 to the School of Education by June 1 (this fee is non-refundable once submitted to the state of Alaska). The UAF School of Education provides these materials which will then be submitted to the state of Alaska for a criminal background check. Fees are subject to change. These materials will be provided to the student.

Professional Field Experiences

The Secondary Post-Baccalaureate Licensure Program includes a comprehensive internship experience in an educational setting. Internship placements are arranged and supervised by university faculty in partnership with the principal and staff from the public school. University course work and classroom practice are closely linked and communication about performance in both the course work and classroom practice is shared among the partners. Internships follow the K – 12 school year calendar and not the university academic year calendar.

Performance in the internship must meet stated competencies and individual outcomes. Performance evaluations determine the candidate's progress toward meeting the State of Alaska Standards for Alaska's Teacher and the International Society for Technology in Education's National Education Technology Standards and Performance Indicators for All Teachers and performance guidelines of Specialty Performance Organizations.

It is expected that candidates will demonstrate appropriate professional characteristics with respect to their actions, attitudes and performance. Teacher candidates are required to adhere to the characteristics of professionalism as published in the Secondary Post-Baccalaureate Licensure Handbook, and to abide by the State of Alaska Code of Ethics of the Education Profession. Unacceptable academic performance, an unprofessional attitude, unsatisfactory field reports, violation of professional ethics, or other factors that may result in removal from the field experience and denial of the Institutional Recommendation for teacher certification.

Internship placements are made in partnership with participating school districts, which may request additional information and/or preparation from candidates according to the district's established policies and practices. Because cooperating districts also determine the number of placements available for candidates, placement may become competitive if the number of applicants exceeds

the number of spaces. Districts also reserve the right to refuse or terminate placements when candidates do not meet a minimum standard of performance. Thus, while the University will make every effort to identify appropriate field experiences, admission to the Secondary Post-Baccalaureate Licensure program does not guarantee and internship placement.

Program Requirements

- Complete the following for secondary licensure:
 - EDSC F402—Methods of Teaching in the Secondary School..... 3
 - EDSC F407—Reading Strategies for Secondary Teachers..... 3
 - EDSC F415—Foundations of Modern Educational Practices (3)
 - or EDSC F205—Introduction to Secondary Education (3)..... 3
 - EDSC F614—Learning, Development and Special Needs Instruction (3)
 - or EDSE F622—Curriculum and Strategies II: High Incidence (3)
 - or EDSE F482—Inclusive Classrooms for All Children (3)..... 3
 - EDSC F631—Secondary Instruction and Assessment in the Content Area* (3)
 - or EDSC F632—English/Language Arts Secondary Instruction and Assessment* (3)
 - or EDSC F633—Mathematics Secondary Instruction and Assessment* (3)
 - or EDSC F634—Science Secondary Instruction and Assessment* (3)
 - or EDSC F635—Social Studies Secondary Instruction and Assessment* (3)
 - or EDSC F636—Art Secondary Instruction and Assessment* (3)
 - or EDSC F637—World Language Secondary Instruction and Assessment* (3)..... 3*
 - EDSC F642—Technology Applications in Education 3
 - EDSC F657—Multicultural Education and School-Community Relations 4
 - EDSC F658—Classroom Organization and Management 3
 - EDSC F471—Secondary Teaching: School Internship I and Seminar 3
 - EDSC F472—Secondary Teaching: School Internship II and Seminar 3
 - Minimum credits required 31
- * Candidates must take the section or course that corresponds with their major teaching content areas.

Special Education K – 12 Post-Baccalaureate Certificate of Completion

Prepares K – 12 special educators at the graduate level with specific training in the areas of disabilities, assessment, interventions strategies, current law and the implementation of programs including development of legally defensible federal IDEA documents.

Graduates will have mastery of the Council for Exceptional Children standards for special education teachers: foundations in special education, development and characteristics of learners, individual learning differences, instructional strategies, learning environments and social interactions, communication, instructional planning, assessment, and professional and ethical practice. The program will provide individuals who already possess, or are eligible for, a current Alaska teaching certificate or a bachelor's degree and the necessary prerequisites, with specific training in the area of special education. The program prepares K – 12 special education teachers who can effectively understand state and national education issues and respond appropriately. Special education candidates will progress through a series of developmentally sequenced field experiences for all ages, types and levels of abilities, including collaborative opportunities. Those who complete the program will have met the national Council for Exceptional Children content standards.

The program provides development in collaboration/consultation models and program development in multicultural settings. Completion of this program meets requirements for Alaska licensure as a K – 12 special education teacher.

Program Requirements for Certified Teachers

- Complete the following admission requirements:
 - Admission requirements for the graduate program.
 - Current teaching certificate or equivalent course work towards an Alaska teaching certificate.
- Prerequisite: EDSE F482—Inclusive Classroom for All Children or comparable transfer course from another institution 3
- Complete the general university requirements.
- Complete the following:
 - EDSE F610—Assessment of Students with Disabilities 3
 - EDSE F612—Curriculum and Strategies I: Low Incidence 3
 - EDSE F622—Curriculum and Strategies II: High Incidence 3
 - EDSE F632—Special Education Law: Principles and Practices 3
- Complete one of the following:
 - EDSE F625—Teaching Mathematics to Special Learners (3)
 - or EDSE F605—Early Childhood Special Education (3)
 - or EDSE F677—Reading Assessment, Curriculum, and Strategies 3
- Complete one of the following:
 - EDSE F624—Social/Emotional Development, Assessment and Intervention(3)
 - or EDSE F633—Autism: Communication and Social Disorders (3)
 - or EDSE F640—Collaboration and Consultative Methods (3)
 - or EDSE F642—Autism and Asperger Syndrome: Social and Behavioral Issues (3) 3
- Complete the following:
 - EDSE F680—Special Education Clinical Practice* 3
 - EDSE F681—Special Education Portfolio** 3
- Minimum credits required 24

* Additional fee required. Charges are added to fee statements every semester.

** Students pursuing a K – 12 Special Education certificate must complete a clinical practice and portfolio in a public school setting.

Note: The Alaska Department of Education and Early Development requires passing Praxis II Elementary Content Knowledge #0014 or the Praxis II in the candidate's content area for secondary education before issuing a professional teaching certificate. English Content Knowledge #0041 and/or Math Content Knowledge #0061 are recommended. Districts prefer candidates have both #0041 and #0061 for teaching core classes for students who qualify for special education at the secondary level.

Program Requirements for Initial Certification

- Complete the following admission requirements:
 - Admission requirements for the graduate program.
 - Baccalaureate degree along with the following prerequisites:
 - Documented recent experience (minimum 12 hours) in an educational setting with children experiencing disabilities.
 - UAF prerequisite courses or comparable transfer courses:
 - ED F245—Child Development..... 3
 - ED F201—Introduction to Education (3)
 - or EDSC F205—Introduction to Secondary Education (3)
 - or EDSC F415—Foundations of Education in Alaska: from Segregation to Standards..... 3
 - EDSE F482—Inclusive Classroom for all Children..... 3
 - An Alaska studies course approved by the Alaska Department of Education and Early Development.
 - A multicultural education/cross-cultural communication course approved by the Alaska Department of Education and Early Development.

- v. Passing scores on the Praxis I or another test acceptable to the Alaska Department of Education and Early Development before or during the first semester of classes. Acceptable test scores include:
Praxis I—Writing 174; Reading 175; Math 173
or CBEST: 123, no individual score less than 37
or WEST-B: Writing 240, Reading 240, Math 240
- vi. Passing score on the following Praxis II before or during the first semester of classes:
0014 Elementary Content Knowledge: Minimum score 143
or 0041 English Content Knowledge: Minimum score 158
and 0061 Math Content Knowledge: Minimum score 116
2. All prerequisite courses must be completed with a minimum final grade of B (3.0). Once the admission requirements, prerequisite courses and testing requirements have been met, applicants will be formally admitted to the program.
3. Complete the general university requirements (page 202).
4. All students not possessing a current Alaska teacher certificate are required to take 6 credits of clinical practice. Clinical practice courses are taken the last two semesters of the program. To enter the clinical practice, students must apply for authorization from the state of Alaska. This includes fingerprinting and a background check. Fingerprint clearance may take up to six months to complete. Submit the clinical practice application two semesters prior to the desired placement. Failure to comply with the requirement, falsification of information, or evidence of a criminal conviction that is named in the law or the Professional Teaching Practices Commission is considered an ethics violation. This will result in denied access to field placement in Alaska school districts. Authorization is required before clinical practice can begin.
5. Complete the following:
EDSE F610—Assessment of Students with Disabilities..... 3
EDSE F612—Curriculum and Strategies I: Low Incidence..... 3
EDSE F622—Curriculum and Strategies II: High Incidence 3
EDSE F632—Special Education Law: Principles and Practices 3
6. Complete one of the following:
EDSE F605—Early Childhood Special Education (3)
or EDSE F625—Teaching Mathematics to Special Learners (3)
or EDSE F677—Reading Assessment, Curriculum, and Strategies 3
7. Complete one of the following:
EDSE F624—Social/Emotional Development, Assessment and Intervention(3)
or EDSE F633—Autism: Communication and Social Disorders (3)
or EDSE F640—Collaboration and Consultative Methods (3)
or EDSE F642—Autism and Asperger Syndrome: Social and Behavioral Issues (3)..... 3
8. Complete the following:
EDSE F678—Special Education Clinical Practice: Initial* 3
EDSE F680—Special Education Clinical Practice* 3
EDSE F681—Special Education Portfolio** 3
9. Minimum credits required*** 27

* Additional fee required. Charges are added to fee statements every semester.

** Students pursuing a K–12 Special Education certificate must complete a Clinical Practice and Portfolio in a public school setting.

Note: The Alaska Department of Education and Early Development requires passing Praxis II Elementary Content Knowledge #0014 or the Praxis II in the candidate's content area for secondary education before issuing a professional teaching certificate. English Content Knowledge #0041 and/or Math Content Knowledge #0061 are recommended. Districts would prefer candidates have both #0041 and #0061 for teaching core classes for students who qualify for special education at the secondary level.

M.Ed. Degree

Students may earn an M.Ed. in these areas of specialization: cross-cultural education, curriculum and instruction, language and literacy, elementary education, secondary education, counseling and special education. For elementary education, secondary education and counseling majors, refer to specific admission and program requirements listed in the respective sections of the catalog.

Admission requirements

Applications will be reviewed on March 1 and Oct. 1 for admission in the following semester. Faculty may vote to admit, not admit or admit with stipulations. Stipulations are specified when additional development in particular areas is needed before beginning a graduate degree program.*

The master of education in counseling program reviews applications on March 1 only.

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

1. Bachelor's degree and a 3.0 GPA.
2. One year of satisfactory teaching or administrative experience. Alternative experience may be accepted.

Complete the following application procedures for the UAF Graduate School:

1. Submit a graduate application form to the UAF Office of Admissions.
2. Submit scores on the general Graduate Record Examination if undergraduate GPA is below 3.0.
3. Submit a four-five page essay which describes your career goals and educational philosophy, and how those goals and philosophy are relevant to the School of Education's mission and education graduate degree program.
4. Submit official transcripts.
5. Submit three letters of reference.
6. Submit a resume.

Master of Education in Counseling

Students may earn an M.Ed. degree in counseling with specialization in school or community counseling. Refer to the counseling program section of this catalog for more information.

Master of Education in Cross-Cultural Education

Program Requirements

1. Complete the general university requirements (page 202).
2. Complete M.Ed. degree requirements (page 208).
3. Complete the admission requirements for the Master of Education Degree.
4. Complete the following:
ED F601—Introduction to Applied Social Science Research..... 3
ED/CCS F603—Field Study Research Methods (3)
or ED/CCS F604—Documenting Indigenous Knowledge Systems (3) 3
ED F698—Research (6)
or ED F699—Thesis (6) 6
5. Complete one of the following cross-cultural foundations with Focus on Alaska Context Courses:
ED/CCS F610—Education and Cultural Processes..... 3
ED/CCS F611—Culture, Cognition and Knowledge Acquisition..... 3
ED F616—Education and Socioeconomic Change..... 3
ED F620—Language, Literacy and Learning 3
ED F631—Culture, Community and Curriculum..... 3
ED F669—Reading Language and Culture 3

6. Complete at least 15 credits of approved electives in cross-cultural education in consultation with the student's graduate advisory committee 15
7. Minimum credits required 30

Master of Education in Curriculum and Instruction

Program Requirements

1. Complete the general university requirements (page 202).
2. Complete M.Ed. degree requirements (page 208).
3. Complete the admissions requirements for the Master of Education degree.
4. Complete the following:
 - ED F601—Introduction to Applied Social Science Research..... 3
 - ED/CCS F603—Field Study Research Methods (3) 3
 - or ED/CCS F604—Documenting Indigenous Knowledge Systems (3) 3
 - ED F612—Foundations of Education..... 3
 - ED F630—Curriculum Development 3
 - ED F659—Multimedia Tools for Teachers 3
 - ED F686—Assessment and Testing in K – 12 School 3
 - ED F698—Research (6) 6
 - or ED F699—Thesis..... 6
5. Complete one of the following cross-cultural foundations with focus on Alaska context courses:
 - ED/CCS F610—Education and Cultural Processes..... 3
 - ED/CCS F611—Culture, Cognition and Knowledge Acquisition..... 3
 - ED F616—Education and Socioeconomic Change..... 3
 - ED F620—Language, Literacy and Learning 3
 - ED F631—Culture, Community and Curriculum..... 3
 - ED F669—Reading Language and Culture 3
6. Complete one F600-level education elective course 3
7. Minimum credits required 30

Master of Education in Elementary Education

Following completion of the year-long UAF, post-baccalaureate elementary licensure program, students can pursue a M.Ed. degree in elementary education if they choose to do so. Thirteen specified graduate credits from the elementary licensure program can be used to meet the M.Ed. elementary education requirements. Courses are available through UAF by distance delivery and on the Fairbanks campus. Students can enroll in courses throughout the year. Licensure and the master's degree requirements must be met within seven years of the beginning of the program.

Students who have completed undergraduate courses 110, 201, 330, 410 and EDSE F482 as part of their licensure program must complete additional graduate level course work to receive a master's degree. Please contact the School of Education Student Services Office for additional information.

Program Requirements

1. Complete the general university requirements (page 202).
2. Complete M.Ed. degree requirements (page 208).
3. Complete the admission requirements for the graduate-level elementary post-baccalaureate licensure program.
4. Complete the following:
 - ED F624—Foundations of Education in Alaska: From Segregation to Standards..... 3
 - ED F625—Exceptional Learners and Child Development: Individual and Cultural Characteristics..... 3
 - ED F626—Teaching Reading, Writing, and Language Arts 3
 - ED F678—Mathematics Methods and Curriculum Development..... 2
 - ED F688—Science Methods and Curriculum Development 2

- ED F601—Introduction to Applied Social Science Research..... 3
- ED/CCS F603—Field Study Research Methods (3)..... 3
- or ED/CCS F604—Documenting Indigenous Knowledge Systems (3) 3
- ED F698—Research (6) 6
- or ED F699—Thesis (6) 6

5. Complete two graduate-level elective courses approved by candidate's graduate committee 6
6. Minimum credits required 30

Master of Education in Online Innovation and Design

Program Requirements

1. Complete the general university requirements (page 202).
2. Complete M.Ed. degree requirements (page 208).
3. Complete the admission requirements for the Master of Education degree.
4. Complete the following:
 - ED F431—Web 2.0 Fundamentals 3
 - ED F432—Fundamentals in Media Design 3
 - ED F601—Introduction to Applied Social Science Research..... 3
 - ED F650—Current Issues in Technology 3
5. Complete one of the following cross-cultural foundations with focus on Alaska context courses:
 - ED/CCS F610—Education and Cultural Processes..... 3
 - ED/CCS F611—Culture, Cognition and Knowledge Acquisition..... 3
 - ED F616—Education and Socioeconomic Change..... 3
 - ED F620—Language, Literacy and Learning 3
 - ED F631—Culture, Community and Curriculum..... 3
 - ED F669—Reading, Language and Culture 3
6. Complete two of the following:
 - ED F653—Instructional Design 3
 - ED F654—Digital Citizenship, Internet Legal issues, Copyright and Fair Use 3
 - ED F655—Online Pedagogy 3
 - ED F676—Supporting Learning in Diverse Systems 3
 - ED F677—Digital Storytelling..... 3
7. Complete the following for the thesis option:
 - ED/CCS F603—Field Study Research Methods (3) 3
 - or ED/CCS F604—Documentation Indigenous Knowledge Systems..... 3
 - ED F699—Thesis 6
8. Complete the following for the project option:
 - ED/CCS F603—Field Study Research Methods (3) 3
 - or ED/CCS F604—Documentation Indigenous Knowledge Systems..... 3
 - ED F698—Research 6
9. Complete the following for the comprehensive exam option:
 - Nine graduate-level elective credits approved by candidate's graduate committee 9
 - Comprehensive examination 9
10. Minimum credits required 30

Master of Education in Language and Literacy

Program Requirements

1. Complete the general university requirements (page 202).
2. Complete M.Ed. degree requirements (page 208).
3. Complete the admission requirements for the Master of Education degree.

4. Complete the following:
 - ED F601—Introduction to Applied Social Science Research..... 3
 - ED/CCS F603—Field Study Research Methods (3)
 - or ED/CCS F604—Documenting Indigenous Knowledge Systems (3) 3
 - LING F602—Second Language Acquisition..... 3
 - LING F610—Theory and Methods of Second Language Learning..... 3
 - ED F669—Reading Language and Culture 3
 - ED F698—Research (6)
 - or ED F699—Thesis (6)..... 6
5. Complete one of the following cross-cultural foundations with Focus on Alaska Context Courses:
 - ED/CCS F610—Education and Cultural Processes..... 3
 - ED/CCS F611—Culture, Cognition and Knowledge Acquisition..... 3
 - ED F616—Education and Socioeconomic Change..... 3
 - ED F620—Language, Literacy and Learning 3
 - ED F631—Culture, Community and Curriculum..... 3
6. Complete two F600-level education elective courses..... 6
7. Minimum credits required..... 30

Master of Education in Secondary Education

Following the completion of the year-long UAF secondary post-baccalaureate licensure program, students can pursue an M.Ed. degree in secondary education.

This program is designed to expand the preparation and instructional practices of middle and secondary educators and education professionals. Fifteen graduate-level credits from the UAF Secondary Post-Baccalaureate Licensure program may be applied toward the M.Ed. in secondary education program. Courses are available through UAF by distance-delivery and on the Fairbanks campus. Master's degree requirements must be met within seven years of beginning the program.

Program Requirements

1. Complete the general university requirements (page 202).
2. Complete the M.Ed. degree requirements (page 208).
3. Complete the admission requirements for the graduate-level secondary post-baccalaureate licensure program.
4. Complete the following:
 - EDSC F402—Methods of Teaching in the Secondary School (3)
 - or one elective course approved by candidate's graduate committee (3) 3
 - EDSC F614—Learning, Development and Special Needs Instructions (3)
 - or EDSC F622—Curriculum and Strategies II: High Incidence (3) 3
 - EDSC F631—Secondary Instruction and Assessment in the Content Area (3)
 - or EDSC F632—English/Language Arts Secondary Instruction and Assessment (3)
 - or EDSC F633—Mathematics Secondary Instruction and Assessment (3)
 - or EDSC F634—Science Secondary Instruction and Assessment (3)
 - or EDSC F635—Social Studies Secondary Instruction and Assessment (3)
 - or EDSC F636—Art Secondary Instruction and Assessment (3)
 - or EDSC F637—World Language Secondary Instruction and Assessment (3) 3
 - EDSC F642—Teaching with Technology..... 3
 - EDSC F657—Multicultural Education and School-Community Relations 4

- EDSC F658—Classroom Organization and Management 3
 - ED F601—Introduction to Applied Social Science Research 3
5. Complete the following for the thesis option:
 - ED/CCS F603—Field Study Research Methods (3)
 - or ED/CCS F604—Documenting Indigenous Knowledge Systems (3) 3
 - ED F699—Thesis 6
 6. Complete the following for the Project option:
 - ED/CCS F603—Field Study Research Methods (3)
 - or ED/CCS F604—Documenting Indigenous Knowledge Systems (3) 3
 - ED F698—Project..... 6
 7. Complete the following for the Comprehensive Exam option:
 - EDSC F407—Reading Strategies for Secondary Teachers (3)
 - or one elective course approved by candidate's graduate committee (3) 3
 - Six graduate-level elective credits approved by candidate's graduate committee 12
 - Comprehensive Examination 31
 8. Minimum credits required..... 31

Master of Education in Special Education

Prepares K – 12 special educators at the graduate level with specific training in the areas of disabilities, assessment, interventions strategies, current law and the implementation of programs including development of legally defensible federal IDEA documents. Graduates will have mastery of the Council for Exceptional Children standards for special education teachers: foundations in special education, development and characteristics of learners, individual learning differences, instructional strategies, learning environments and social interactions, communication, instructional planning, assessment, and professional and ethical practice.

The program will provide individuals who already possess, or are eligible for, a current Alaska teaching certificate or a bachelor's degree and the necessary prerequisites with specific training in the area of special education. The program prepares K – 12 special education teachers who can effectively understand state and national education issues and respond appropriately. Special education candidates will progress through a series of developmentally sequenced field experiences for all ages, types and levels of abilities including collaborative opportunities. Those who have completed the program will have met the National Council for Exceptional Children content standards.

The Master of Education in Special Education provides development in collaboration/consultation models and program development in multicultural settings. Completion of this program meets requirements for Alaska licensure as a K – 12 special education teacher.

Program Requirements for Certified Teachers

1. Complete the following admission requirements:
 - a. Admission requirements for the graduate program.
 - b. Current Alaska teaching certificate or equivalent coursework towards an Alaska teaching certificate.
2. Prerequisite: EDSE F482—Inclusive Classroom for All Children or comparable transfer course from another institution..... 3
3. Complete general university requirements
4. Complete the M.Ed. degree requirements
5. Complete the following:
 - EDSE F610—Assessment of Students with Disabilities..... 3
 - EDSE F612—Curriculum and Strategies I: Low Incidence..... 3
 - EDSE F622—Curriculum and Strategies II: High Incidence 3
 - EDSE F632—Special Education Law: Principles and Practices 3

6. Complete one of the following:
 EDSE F625—Teaching Mathematics to Special Learners (3)
 or EDSE F605—Early Childhood Special Education (3)
 or EDSE F677—Reading Assessment, Curriculum, and
 Strategies 3
 7. Complete one of the following:
 EDSE F624—Social/Emotional Development, Assessment and
 Intervention (3)
 or EDSE F633—Autism: Communication and
 Social Disorders (3)
 or EDSE F640—Collaboration and Consultative Methods (3)
 or EDSE F642—Autism and Asperger Syndrome: Social
 and Behavioral Issues (3) 3
 8. Complete two graduate-level special education electives approved
 by candidate's graduate committee 6
 9. Complete the following:
 EDSE F680—Special Education Clinical Practice* 3
 EDSE F681—Special Education Portfolio** 3
 ED F601—Introduction to Applied Social
 Science Research 3
 ED F603—Field Study Research Methods (3)
 or ED/CCS F604—Documenting Indigenous Knowledge
 Systems 3
 10. Complete comprehensive examination.***
 11. Minimum credits required 36
- * Additional fee required. Charges are added to fee statements every semester.
- ** Students pursuing a K-12 Special Education certificate must complete a Clinical Practice and Portfolio in a public school setting
- *** Must be enrolled in 3 graduate credits the semester the comprehensive exam is completed.
- Note: The Alaska Department of Education and Early Development requires passing Praxis II Elementary Content Knowledge #0014 or the Praxis II in the candidate's content area for secondary education before issuing a professional teaching certificate. English Content Knowledge #0041 and/or Math Content Knowledge #0061 are recommended. Districts would prefer candidates have both #0041 and #0061 for teaching core classes for students who qualify for special education at the secondary level.

Program Requirements for Initial Certification

1. Complete the following admission requirements:
 - a. Admission requirements for the graduate program.
 - b. Baccalaureate degree along with the following prerequisites:
 - i. Documented recent experience (minimum of 12 hours) in an educational setting with children experiencing disabilities.
 - ii. UAF prerequisite course or comparable transfer courses:
 ED F245—Child Development 3
 ED F201 Introduction to Education (3)
 or EDSC F205—Introduction to Secondary Education (3)
 or EDSC F415—Foundations of Modern Educational
 Practice (3)
 or ED F624—Foundations of Education in Alaska:
 From Segregation to Standards (3) 3
 EDSE F482—Inclusive Classrooms for All Children 3
 - iii. An Alaska studies course approved by the Alaska Department of Education and Early Development.
 - iv. A multicultural education/cross-cultural communication course approved by the Alaska Department of Education and Early Development.
 - v. Passing scores on the Praxis I or another test acceptable to the Alaska Department of Education and Early Development before or during the first semester of classes. Acceptable scores include:
 Praxis I—Writing 174; Reading 175; Math 173
 CBEST: 123, no individual score less than 37
 WEST-B: Writing 240, Reading 240, Math 240

- vi. Passing score on the following Praxis II before or during the first semester of classes:
 0014—Elementary Content Knowledge:
 Minimum score 143
 or 0041 English Content Knowledge: Minimum score 158
 and 0061 Math Content Knowledge: Minimum score 116

2. All prerequisite courses must be completed with a minimum final grade of B. Once the admission requirements, prerequisite courses and testing requirements have been met, applicants will be formally admitted to the program.
 3. Complete the general university requirements (page 202).
 4. Complete the M.Ed. degree requirements (page 208)
 5. All students not possessing a current Alaska teacher certificate are required to take 6 credits of clinical practice. Clinical practice courses are taken the last two semesters of the program. To enter the clinical practice, students must apply for authorization from the state of Alaska. This includes fingerprinting and a background check. Fingerprint clearance may take up to six months to complete. Submit the clinical practice application two semesters prior to the desired placement. Failure to comply with the requirement, falsification of information, or evidence of a criminal conviction that is named in the law or the Professional Teaching Practices Commission is considered an ethics violation. This will result in denied access to field placement in Alaska school districts. Authorization is required before clinical practice can begin.
 6. Complete the following:
 EDSE F610—Assessment of Students with Disabilities 3
 EDSE F612—Curriculum and Strategies I: Low Incidence 3
 EDSE F622—Curriculum and Strategies II: High Incidence 3
 EDSE F632—Special Education Law: Principles and
 Practices 3
 7. Complete one of the following:
 EDSE F605—Early Childhood Special Education (3)
 or EDSE F625—Teaching Mathematics to Special Learners (3)
 or EDSE F677—Reading Assessment, Curriculum, and
 Strategies (3) 3
 8. Complete one of the following:
 EDSE F624—Social/Emotional Development, Assessment and
 Intervention (3)
 or EDSE F633—Autism: Communication and Social
 Disorders (3)
 or EDSE F640—Collaboration and Consultative Methods (3)
 or EDSE F642—Autism and Asperger Syndrome: Social and
 Behavioral Issues (3) 3
 9. Complete two graduate level special education electives approved
 by candidate's graduate committee 6
 10. Complete the following courses:
 EDSE F678—Special Education Clinical Practice: Initial* 3
 EDSE F680—Special Education Clinical Practice* 3
 EDSE F681—Special Education Portfolio** 3
 ED F601—Introduction to Applied Social Science Research 3
 ED F603—Field Study Research Methods (3)
 or ED/CCS F604—Documenting Indigenous
 Knowledge Systems (3) 3
 11. Complete comprehensive examination***
 12. Minimum credits required 39
- * Additional fee required. Charges are added to fee statements every semester.
- ** Students pursuing a K – 12 Special Education certificate must complete a Clinical Practice and Portfolio in a public school setting.
- *** Must be enrolled in 3 graduate credits the semester the comprehensive exam is completed.
- Note: The Alaska Department of Education and Early Development requires passing Praxis II Elementary Content Knowledge #0014 or the Praxis II in the candidate's content area for secondary education before issuing a

professional teaching certificate. English Content Knowledge #0041 and/or Math Content Knowledge #0061 are recommended. Districts prefer candidates have both #0041 and #0061 for teaching core classes for students who qualify for special education at the secondary level.

Educational Leadership

The Master of Education in educational leadership is a state-wide program offered through the University of Alaska Anchorage for more information see the following website: <http://coe.uaa.alaska.edu/programs/leadership/>.

Interdisciplinary Ph.D. Degree

Students wishing to further their education beyond a master of education degree may pursue an interdisciplinary Ph.D. degree. For more information, refer to the program section on interdisciplinary studies — Ph.D. degree.

ELECTRICAL ENGINEERING

College of Engineering and Mines
Department of Electrical and Computer Engineering
907-474-7137
www.uaf.edu/cem/ece/

M.E.E., M.S. Degrees

Minimum Requirements for Degrees: M.E.E.: 32 credits;
M.S.: 30 credits

The M.E.E. degree program, designed for the practicing professional engineer, focuses on a major project. The M.S. degree includes a written thesis and oral defense for those students interested in research and development. UAF offers an engineering Ph.D. program for students with an approved curriculum. Capable students with undergraduate degrees in physics, mathematics or related sciences, as well as in various branches of engineering, may also be admitted for graduate study. A student with adequate background can usually complete M.S. requirements within two academic years and a Ph.D. in another three academic years.

Graduate degree programs in electrical and computer engineering are closely connected with research activities of the faculty. The main areas of research include communications, radar, lidar and sonar remote sensing, instrumentation and microwave circuit design, electric power and energy systems, digital and computer engineering, nanotechnology, controls and robotics. Current research topics include high latitude satellite communications, rocket telemetry, radio wave propagation, ultra wide band wireless communications, electromagnetic and acoustic wave propagation, remote biomedical and environmental instrumentation, microwave design, digital signal processing, digital and physical electronics, computer applications, remote hybrid electric power systems, electric power system design and analyses, electric power quality improvement, system identification, simulation, computer-controlled systems, control theory, robotics and automation.

A number of on- and off-campus research facilities are available to students. Satellite, rocket and ground-based communication studies are carried out both on campus and at Poker Flat Research Range. The Sounding Rocket Laboratory provides opportunities for developing instrumentation for sounding rocket payloads launched from Poker Flat Research Range — the only university-operated rocket range in the world. The Arctic Region Supercomputing Center on campus provides a wide array of tools for digital system research. The department also has a variety of research laboratories available, including microwave, wireless communications, ultra wide band technology, waves, power electronics/robotics, instrumentation and digital laboratories.

Alaska's environment and remote location provide unique opportunities for research in a wide range of areas, such as the use of acoustic, light and radio wave techniques for measuring fish in Alaskan rivers to the geophysical properties of the aurora. Remote sensing for biomedical (animal tracking) and environmental (groundwater and air monitoring) applications is an important research area for Alaska. Electric power systems research includes issues related to isolated rural Alaskan communities, analysis of larger interconnected generation, transmission and distribution systems serving major Alaskan population centers, and the use of alternative energy systems.

Graduate students in electrical and computer engineering at UAF receive the highest quality, contemporary education available at the graduate level and perform research appropriate to the technical needs of the state of Alaska, the nation and the world.

Graduate Program — M.E.E. Degree

1. Complete the following admission requirement:
 - a. Submit GRE scores.
 2. Complete one of the following admission requirements:
 - a. Complete a bachelor's degree in electrical engineering.
 - b. Students with bachelor's degrees in other fields should work out a program to address any background deficiencies with their graduate committee.
 3. Complete the general university requirements (page 202).
 4. Complete the master's degree requirements (page 206).
 5. Minimum credits required* 32
- * At least 26 credits must be at the F600-level. A research project is not required, although up to 6 credit hours of research may be completed as part of the degree program. If a research project is part of the degree program, an oral project presentation and defense is required.

Graduate Program — M.S. Degree

1. Complete the following admission requirement:
 - a. Submit GRE scores.
 2. Complete one of the following admission requirements:
 - a. Complete a bachelor's degree in electrical engineering.
 - b. Students with bachelor's degrees in other fields should work out a program to address any background deficiencies with their graduate committee.
 3. Complete the general university requirements (page 202).
 4. Complete the master's degree requirements (page 206).
 5. Minimum credits required 30*
- * At least 24 credits must be at the F600-level.
See Engineering for Ph.D. program.

ENGINEERING

College of Engineering and Mines
907-474-7241
www.uaf.edu/cem/

Ph.D. Degree

Minimum Requirements for Degree: 36 credits

Engineers use knowledge of the mathematical and natural sciences to develop economical uses of materials and forces of nature for human benefit. The professional practice of engineering requires sophisticated skills, use of judgment and exercise of discretion. The basic education necessary for the professional practice of engineering is provided by the engineering bachelor and master's degrees. Doctoral-level education requires independent research that generates fundamental advances in technology and discovers

new knowledge for the benefit of society. Engineering Ph.D. degrees provide leadership in scientific research, academia and industrial research and development. The Ph.D. degree in engineering draws on the combined strength of the College of Engineering and Mines and offers opportunities for engineers at other UA campuses to participate.

Graduate Program — Ph.D. Degree

Concentrations: Arctic, Civil, Computer, Electrical, Engineering Management, Environmental, Geological, Mechanical, Mining and Petroleum

- Complete the following admissions requirements:
 - Complete either a B.S. or M.S. degree in engineering.
 - Complete a master's degree in engineering or a closely related field.
 - Submit GRE scores.
- Complete the general university requirements (page 202).
- Complete the Ph.D. degree requirements (page 207).
- As part of the Ph.D. degree requirements, complete the following:
 - Complete at least 18 credits of course work beyond the M.S. degree.
 - Complete at least three full-time semesters of residency, which may include a summer semester. Residency is defined as living in the Fairbanks area, working with the student's graduate advisor and graduate committee, while taking courses at UAF.
 - Complete and pass a written and oral comprehensive examination.
 - Complete and submit a written thesis proposal for approval.
 - Complete a research program as arranged with the graduate advisory committee.
 - Complete a thesis that is a substantial contribution to the body of knowledge in engineering and pass an oral defense of thesis.
- Minimum credits required 36

ENGINEERING MANAGEMENT

College of Engineering and Mines
Department of Civil and Environmental Engineering
907-474-7241
www.uaf.edu/esm/

M.S. Degree

Minimum Requirements for Degree: 30 credits

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

Graduate Program — M.S. Degree

- Complete the following admission requirements and recommendations:
 - Complete a bachelor's degree in an engineering discipline.
 - On-the-job experience in engineering is recommended.
- Complete the general university requirements (page 202).
- Complete the master's degree requirements (page 206).
- Present project reports which provide comprehensive analysis and propose solutions to a situation in an engineering or scientific management setting. Pass an oral comprehensive examination.

- Complete courses from the four main engineering management subject areas as follows:
 - Human Element (two courses required)
 - ESM F601—Managing and Leading Engineering Organizations 3
 - BA F607—Human Resources Management 3
 - Project Management (two courses required)
 - ESM F609—Project Management (3)
 - or ESM F608—Legal Principles for Engineering Management (3)
 - or CE F620—Civil Engineering Construction (3) 6
 - Quantitative Methods (one course required)
 - ESM F622—Engineering Decisions (3)
 - or ESM F620—Statistics for ESM (3)
 - or ESM F621—Operations Research (3) 3
 - Financial (two courses required)
 - ACCT F602—Accounting for Managers 3
 - ESM F605—Engineering Economic Analysis* 3
 - Complete the following:
 - ESM F684—Engineering/Science Management Project 3
 - Minimum credits required 30
- * May be waived with prior undergraduate engineering economics course.
Note: Balance of credits may be managerial or technical electives as approved by the student's graduate advisory committee.
- See Arctic Engineering.
See Civil Engineering.
See Engineering for Ph.D. program.
See Environmental Engineering and Environmental Quality Science.
See Science Management.

ENGLISH

College of Liberal Arts
Department of English
907-474-7193
www.uaf.edu/english/

M.A., M.F.A., M.F.A./M.A. Degrees

Minimum Requirements for Degrees: M.A.: 30 – 36 credits;
M.F.A.: 45 credits; M.F.A./M.A.: 45 credits

The English department offers core courses in writing and literature, and upper-division courses in literature, linguistics, creative writing, technical writing and literary criticism. The department also offers a two-year M.A. degree in literature, a three-year M.F.A. degree in creative writing and an M.F.A./M.A. combined degree in creative writing and literature that can be completed in three years. Teaching assistantships are available for the three programs. The M.A. degree offers advanced study of literature and literary theory, as preparation for teaching or for entering a Ph.D. program. The M.F.A. degree is a terminal degree, culminating in the production of a publication-quality thesis manuscript of poetry, fiction, drama or creative non-fiction. The M.F.A./M.A. is a combined degree designed for qualified individuals who wish to produce a publication-quality thesis manuscript of creative writing, but also would like to pursue in a systematic manner the study of literature and literary theory in preparation for college teaching or entering a Ph.D. program.

Graduate Program — M.A. Degree

- Complete the following admission requirements:
 - Submit GRE scores.
 - Submit academic writing sample.
- Complete the general university requirements (page 202).

3. Complete the master's degree requirements (page 206).
4. Pass a written comprehensive examination based on a standardized reading list; the examination is to be taken in the student's second year of work. The examination will be held on the Saturday ending the fourth full week of classes in the spring semester.
5. Students may advance to candidacy when their advisory committee deems that they have made satisfactory progress toward completion of their degree.
6. Pass an oral defense of the thesis or non-thesis project.
7. Complete the thesis or non-thesis requirement:

Thesis

- Complete the following:
ENGL F601—Bibliography, Methods and Criticism 3
Students are required to take ENGL F601 in their first year of study.
ENGL F685—Teaching College Composition (3)*
or ENGL F600-level elective course (3) 3
- Complete the following:
ENGL F699—Thesis 6
ENGL electives** 18
- Complete three of the following electives:
ENGL F603—Studies in British Literature:
Old and Middle English 3
ENGL F604—Studies in British Literature:
Renaissance and 17th Century 3
ENGL F606—Studies in British Literature:
Restoration and 18th Century 3
ENGL F607—Studies in British Literature: 19th Century 3
- Complete one of the following electives:
ENGL F609—Early and Romantic American Literature 3
ENGL F611—American Realism and Modernism 3
ENGL F612—Twentieth Century American Literature 3
- Complete one of the following electives:
ENGL F608—Studies in British Literature after 1900 3
ENGL F614—Studies in Comparative Literature 3
ENGL F615—Contemporary Literature 3
- Pass an oral defense of the thesis.
- Minimum credits required 30

Non-Thesis

- Complete the following:
Complete required courses and distribution of electives in a, c, d and e in the thesis option. 21
Complete additional approved ENGL F600-level electives 9
Complete ENGL F698—Research (maximum) 6
Complete a research paper which the advisory committee judges to be of publishable quality.
Pass an oral defense of the project
 - Minimum credits required 36
- * Required if you are a teaching assistant or planning to teach.
- ** To maximize breadth of study, M.A. students and their advisors will draft individualized courses of study with the following program requirements in mind. The advisor will direct students to courses covering the required areas, subject to particular exemptions based upon undergraduate course work. Exemptions and any subsequent revisions of the course of study must have the agreement of the advisor and department head. Plans can be revised to substitute an appropriate seminar for one of the courses.

Note: Students may apply up to 3 credit hours of independent study toward the English M.A. degree requirements.

Graduate Program — Creative Writing, M.F.A. Degree

1. Complete the following admission requirements:
 - a. Submit GRE scores.
 - b. Submit creative writing sample.

2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206).
4. Complete and pass a written comprehensive examination, based on a standardized reading list; examination to be taken no later than student's fourth semester of work. Examination will be held on the Saturday ending the fourth full week of classes in the spring semester.
5. Students may advance to candidacy when their advisory committee deems that they have made satisfactory progress in both academic and writing areas.
6. Complete the following:

ENGL F601—Bibliography, Methods and Criticism	3
Students are required to take ENGL F601 in their first year of study.	
ENGL F671—Writers' Workshop.....	9
ENGL F685—Teaching College Composition (3)* or ENGL elective course F600-level (3)	3
ENGL F699—Thesis.....	6
ENGL approved electives	6
Literature seminars**	12
7. Complete two of the following:

ENGL F681—Forms of Poetry	3
ENGL F682—Forms of Fiction	3
ENGL F684—Forms of Non-Fiction Prose	3

8. Minimum credits required 45

* Required if you are a teaching assistant or planning to teach.

** Minimum of four to be determined by student's advisory committee. A literature class is one that does not have as its primary purpose the training of a student to be a creative writer or to teach composition. The following English courses are considered those that meet the literature-seminar requirement for the MFA degree: ENGL F603, F604, F606, F607, F608, F609, F611, F612, F614, F615, F620 and versions of F692 and F693 that meet the above criteria.

Note: A student may petition the Thesis Advisory Committee and the Department Chair to take up to 6 credit hours of Independent Study to be applied toward the English MFA electives requirement. Note: The English department requires that a student receive an A or B grade for all F600-level courses that the student wishes to apply toward the master's degree programs.

Graduate Program — M.F.A./M.A. Combined Degree in Creative Writing and Literature

1. A student who wishes to be awarded an M.F.A./M.A. combined degree in creative writing and literature must be admitted to both programs;
2. Fulfill all general university requirements and master's degree requirements and all course requirements within both programs (double counting allowed);
3. Pass comprehensive examinations in both programs;
4. Complete a thesis required for an M.F.A. degree and
 - a. a thesis required for an M.A. degree,
 - b. OR a scholarly essay which from a critical and/or historical perspective supplements the M.F.A. thesis and which the advisory committee(s) must judge to be of publishable quality,
 - c. OR a scholarly essay on a topic approved by the advisory committee(s) and likewise judged as publishable.
5. Pass an oral examination of materials submitted from 4 above.
6. Finish all requirements in order to be awarded the combined degree instead of the M.A. or M.F.A. separately (i.e., a student may not claim at any time more than one degree for the same work).

ENVIRONMENTAL CHEMISTRY

College of Natural Science and Mathematics
Department of Chemistry and Biochemistry
907-474-5510
www.uaf.edu/chem/

M.S., Ph.D. Degrees

Minimum Requirements for Degrees: M.S.: 30 credits;
Ph.D.: 18 thesis credits

Environmental Chemistry is a diverse and highly interdisciplinary field that focus on the chemical processes influencing the composition and chemical speciation of natural systems (air, water and soils), the chemical fate and mobility of contaminants in the environment, chemical processes that affect the toxicity and bioavailability of contaminants and chemical aspects of contaminant remediation and pollution prevention (green chemistry). The common link to all these areas of study is a focus on the underlying chemical structure, reactivity and mechanisms that dictate the extent and rates of environmentally important chemical reactions. Environmental chemistry is a challenging field, requiring core training in physical, analytical, organic and inorganic chemistry and an understanding of how these disciplines can be applied to complex environmental systems. It is also a highly rewarding discipline, as it provides a quantitative and fundamental approach to understanding the processes that influence the quality of the environment we live and work in.

The UAF Department of Chemistry and Biochemistry offers B.S., M.S. and Ph.D. degrees in Environmental Chemistry. The program provides education and research opportunities focused on the molecular scale aspects of environmental science. The program defines three tracks to meet a wide range of student interest, including (i) Atmospheric Chemistry (ii) Aqueous/Environmental Geochemistry, and (iii) Environmental Toxicology and Contaminant Fate. Students may also design a custom focus area, subject to approval by their advisory committee.

Our faculty are involved in a wide range of projects from field studies of chemical transformation and transport, to laboratory and modeling studies of the basic mechanisms of environmental reactions, to the development of novel chemistry useful in contaminant remediation. The program is centered in the Natural Sciences Building on the UAF campus that houses state-of-the-art classrooms, laboratories and computer facilities to support education and research activities. Located in the "Heart of Alaska," UAF is home to numerous research institutes and centers that focus on Arctic science and engineering and provide great opportunities for collaboration and cross-disciplinary studies focused on the chemistry of polar and sub-arctic systems.

The graduate program in environmental chemistry provides advanced training in the concepts and methods of molecular environmental sciences. The M.S. degree prepares students for careers in the environmental science and technology sector as a specialist in the analysis and interpretation of environmental chemical data and/or for more advanced studies in environmental Chemistry or related disciplines. The requirement of a master's thesis provides an opportunity for students to gain expertise in a particular sub-discipline and, more importantly, gain experience in research methods, presentation skills and critical thinking. The Ph.D. provides advanced training beyond the level of a master's degree with the expectation that Ph.D. recipients will be acknowledged as experts in their particular topic of study. This is accomplished primarily through the Ph.D. thesis, which is a body of independent research that presents new findings on forefront topics related to molecular processes in the environment. The Ph.D. degree in environmental chemistry prepares students for careers in academia or the public and private research sectors. Graduate (M.S. and Ph.D.) students

in the environmental chemistry program are typically supported through teaching and research assistantships or fellowships.

Graduate Program — M.S. Degree

1. Complete the general university requirements (page 202).
2. Complete the master's degree requirements (page 206).
3. Complete two of the following environmental core courses:
CHEM F605—Aquatic Chemistry 3
CHEM F606—Atmospheric Chemistry 3
CHEM F631—Environmental Fate and Transport..... 3
CHEM F655—Environmental Toxicology..... 3
4. Complete two seminar courses
CHEM F691—Research Presentation Techniques 1
CHEM F692—Seminar..... 1
5. Complete approved electives* 3 – 6
6. Complete a thesis..... 12
7. Minimum credits required 30

Graduate Program — Ph.D. Degree

1. Complete the general university requirements (page 202).
2. Complete the Ph.D. degree requirements (page 207).
3. Complete three of the following core courses:
CHEM F605—Aquatic Chemistry 3
CHEM F606—Atmospheric Chemistry 3
CHEM F631—Environmental Fate and Transport..... 3
CHEM F655—Environmental Toxicology..... 3
4. Complete two seminar courses.
CHEM F691—Research Presentation Techniques 1
CHEM F692—Seminar..... 1
5. Complete approved electives* 3 – 6
6. Complete a thesis..... 18
7. Minimum credits required 32

* Approved electives (both M.S. and Ph.D.) are specified by the student's committee. The following tracks are defined as a guide. Within these tracks students will be expected to complete as part of the core and electives:

- i. Atmospheric Chemistry: CHEM F601, CHEM F605, CHEM F606 and CHEM F631
- ii. Aqueous/Environmental Geochemistry: CHEM F605, CHEM F606 or CHEM F631, GEOS F618 and CHEM F609/GEOS F633.
- iii. Environmental Toxicology and Contaminant Fate: CHEM F605 or CHEM F606, CHEM F631 and CHEM F655

A customized focus area may be developed based on an appropriate sequence of core and elective courses, subject to approval by the student's advisory committee.

See Biochemistry and Molecular Biology.
See Chemistry.

ENVIRONMENTAL ENGINEERING AND ENVIRONMENTAL QUALITY SCIENCE

College of Engineering and Mines
Department of Civil and Environmental Engineering
907-474-6129
www.uaf.edu/cem/cee/env/

M.S. Degree

Minimum Requirements for Degree: 30 credits

The environmental engineering and environmental quality science program offers an M.S. degree in environmental engineering for engineers and an M.S. degree in environmental quality science for scientists.

Career opportunities for graduates include water supply, treatment and distribution, waste treatment, water and air pollution, solid waste disposal, hazardous and toxic waste management, pollution prevention, environmental impact evaluation, administration of environmental programs and regulatory compliance. Graduates are prepared to hold positions in government, industry, consulting or academia.

Graduate Program — Environmental Engineering, M.S. Degree

1. Complete the following admission requirements:
 - a. Complete the equivalent of a UAF course in basic computer techniques.
 - b. Complete the TOEFL exam (only required of non-native English speakers. The minimum score required is 575 for the paper test, or 213 for the computerized test).
 - c. Complete a B.S. in engineering from an ABET accredited institution with a GPA of 3.0 or higher.
2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206).
4. Complete the thesis or non-thesis requirements for one of the environmental engineering and environmental quality science concentration areas listed below.

Graduate Program — Environmental Quality Science, M.S. Degree

1. Complete the following admission requirements:
 - a. Complete the equivalent of one year of UAF courses in calculus and general chemistry, and one semester of computer techniques.
 - b. Complete the TOEFL exam (only non-native English speakers, the minimum score required is 575 for the paper test, or 213 for the computerized test).
 - c. Complete a B.S. in science from an accredited institution with a GPA of 3.0 or higher.
2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206).
4. Complete the thesis or non-thesis requirements for one of the environmental engineering and environmental quality science concentration areas listed below.

Concentrations for Environmental Engineering and Environmental Quality Science: Environmental Contaminants, Environmental Science and Management, Water Supply and Waste Treatment

Environmental Contaminants

- a. Complete the following

CE F663—Groundwater Dynamics.....	3
ENVE F641—Aquatic Chemistry	3
ENVE F642—Contaminant Hydrology	3
ENVE F647—Biotechnology	3
ENVE F649—Hazardous and Toxic Waste Management	3
ENVE F650—Seminar* (1)	2
ENVE F653—Measurements Laboratory	1
ENVE F698—Project (3)	
or ENVE F699—Thesis	6
Approved electives**	6 – 9
- b. Minimum credits required..... 30

** Complete two semesters at 1 credit each.*
*** Electives as approved by the student's committee (6 credits for thesis option; 9 credits for project option).*
Note: In addition to the courses listed in any of the concentration areas, electives include but are not limited to: BIOL F642, F680, F682, F685; CE F603, F661, F683, F684; CHEM F631, F655; ENVE F658; GE F620; MATH F608, F615.

Environmental Science and Management

- a. Complete five of the following courses

ENVE F641—Aquatic Chemistry	3
ENVE F644—Environmental Management and Law	3
ENVE F647—Biotechnology	3
ENVE F649—Hazardous and Toxic Waste Management	3
ENVE F651—Environmental Risk Assessment	3
ENVE F652—Toxicology for Engineers and Scientists.....	3
- b. Complete the following

ENVE F650—Seminar* (1)	2
ENVE F653—Measurements Laboratory	1
ENVE F698—Project (3)	
or ENVE F699—Thesis	6
Approved electives**	6 – 9
- c. Minimum credits required..... 30

** Complete two semesters at 1 credit each.*
*** Electives as approved by the student's committee (6 credits for thesis option; 9 credits for project option). For Environmental Engineering candidates, 6 elective credits must be from the following: CE F663, ENVE F642, F643, F645, F646 and F648.*
Note: In addition to the courses listed in any of the concentration areas, electives include but are not limited to: BIOL F642, F680, F682, F685 CE F603, F661, F683, F684; CHEM F631, F655; ENVE F658; GE F620; and MATH F608, F615.

Water Supply and Waste Treatment

- a. Complete the following

ENVE F641—Aquatic Chemistry	3
ENVE F645—Unit Processes — Chemical and Physical.....	3
ENVE F646—Unit Processes — Biological.....	3
ENVE F647—Biotechnology	3
ENVE F650—Seminar* (1)	2
ENVE F653—Measurements Laboratory	1
ENVE F698—Project	3
or ENVE F699—Thesis	6
Approved electives**	6 – 9
- b. Complete one of the following

ENVE F643—Air Pollution Management.....	3
ENVE F648—Solid Waste Management.....	3
ENVE F649—Hazardous and Toxic Waste Management	3
- c. Minimum credits required..... 30

** Complete two semesters at 1 credit each.*
*** Electives as approved by the student's committee (6 credits for thesis option; 9 credits for project option).*
Note: In addition to the courses listed in any of the concentration areas, electives include but are not limited to: BIOL F642, F680, F682, F685; CE F603, F661, F683, F684; CHEM F631, F655; ENVE F658; GE F620; MATH F608, F615.
 See Arctic Engineering.
 See Civil Engineering.
 See Engineering for Ph.D. program.
 See Engineering Management.
 See Science Management.

FISHERIES

School of Fisheries and Ocean Sciences
 907-474-7289
www.sfos.uaf.edu/academics/

M.S., Ph.D. Degrees

Minimum Requirements for Degrees: M.S.: 30 credits;
 Ph.D.: 18 thesis credits

Graduate degree program students attend classes and work with faculty in Juneau and/or Fairbanks. Academic programs can be developed in one of the following subject areas: fisheries management (Juneau and Fairbanks), fish/invertebrate biology (Juneau and

Fairbanks) and aquaculture (Juneau). Research assistantships are available. Applicants should contact the fisheries program for further information and application forms.

Fairbanks' geographic location is advantageous for the study of interior Alaska aquatic habitats. A number of subarctic streams and lakes are within easy reach. Main access to the marine environment from the Fairbanks campus is in Prince William Sound and Cook Inlet.

The Juneau Center, School of Fisheries and Ocean Sciences, houses the UAF fisheries science program in southeast Alaska. The Juneau Center has well-equipped labs, including freshwater and seawater wet labs and computer labs. There is ready access to both marine and freshwater habitats. The Juneau Center is located near the Auke Bay National Marine Fisheries Service Laboratory north of Juneau. The Kodiak Seafood and Marine Science Center is located in Kodiak. It has new facilities for work in harvest technology, seafood technology, seafood biochemistry and microbiology.

Fisheries students in Fairbanks and Juneau have an opportunity to associate with personnel of federal and state conservation agencies. These agencies often hire students for summer field work.

Graduate Program — M.S. Degree

- Complete the following admission requirements:
 - Prerequisites: calculus, elementary statistics, ichthyology or invertebrate zoology and computer competency.
 - Submit GRE scores.
 - Complete the general university requirements (page 202).
 - Complete the master's degree requirements (page 206).
 - Complete the following:

FISH F699—Thesis.....	6 – 12
STAT F401—Regression and Analysis of Variance	4

Students must complete one of the following courses under each area:

Biology and ecology of fish and shellfish

BIOL F415/MSL F615—Physiology of Marine Organisms.....	3
FISH F425—Fish Ecology	3
FISH F426/FISH F626—Behavioral Ecology of Fishes	3
FISH F428/FISH F628—Physiological Ecology of Fishes.....	3
FISH F633—Pacific Salmon Life Histories	3
FISH F650—Fish Ecology	3
FISH F651—Fishery Genetics	4
MSL F640—Fisheries Oceanography	4
MSL F652—Marine Ecosystems	3

Quantitative population dynamics of fish and shellfish

FISH F421—Fisheries Population Dynamics	4
FISH F601—Quantitative Fisheries Science.....	3
FISH F621—Estimation of Fish Abundance.....	3
FISH F622—Quantitative Fish Population Dynamics II	3

Management and human dimensions of fisheries

FISH F411—Human Dimensions of Environmental Systems.....	3
FISH F487—Fisheries Management	3
FISH F640—Management of Renewable Resources.....	3
FISH F675—Political Ecology of the Oceans	3

Graduate seminars..... 2
 - Minimum credits required..... 30
- Note: Students working in subject areas involving significant non-English literature may be expected to read the appropriate foreign language.*
- Note: Only 9 credits of the required 30 M.S. degree credits can be at the 400-level.*

Graduate Program — Ph.D. Degree

- Complete the following admission requirement:
 - Complete a master's degree in a fisheries-related field or meet the requirements as outlined below to be accepted directly into a Ph.D. program without a master's degree.
 - Submit GRE scores.
- Complete the general university requirements (page 202).
- Complete the Ph.D. degree requirements (page 207).
- Complete at least one year of full-time course work, as approved by the student's advisory committee.
- Complete a thesis.
- Minimum credits required..... 18

Admission to Ph.D. program directly from bachelor's program:

Entering graduate students whose highest earned degree is the baccalaureate are normally admitted as master of science candidates. However, exceptionally able and accomplished students in this category are eligible for direct admission to the Ph.D. program. Criteria for direct admission to the Ph.D. program from the baccalaureate are:

- Endorsement by proposed chair of graduate advisory committee AND 2 or 3 below.
- At least one first-authored manuscript published or accepted for publication in a peer-reviewed scientific journal or receipt of an NSF, NIH, or similar prestigious pre-doctoral fellowship.
OR
- Demonstrated research proficiency (e.g. undergraduate thesis, Research Experiences for Undergraduates or other intensive research experience) documented in the application AND either (1) attained a GPA of at least 3.5 at the undergraduate level, or (2) scored at the 80% level in two of three categories in the GRE.

Students who elect this route must fulfill course requirements as outlined for BOTH the M.S. and Ph.D. degrees. Applicants who do not meet these criteria may enter the graduate program as M.S. candidates, and in exceptional cases may petition for conversion to the Ph.D. program after Advancement to Candidacy (for the M.S.). Such petitions must be approved both by the student's current (M.S.) and proposed (Ph.D.) advisory committee and the department director or designee.

GENERAL SCIENCE

College of Natural Science and Mathematics
Department of Physics
907-474-6108
www.uaf.edu/physics/

M.S. Degree

Minimum Requirements for Degree: 30 credits

The general science program offers M.S. degrees in the biological sciences, chemistry, the geosciences and physics. The M.S. degree may be described as a breadth degree, rather than a depth degree, so a candidate normally pursues a course of study in one of these disciplines and is cooperating with at least one other discipline.

Graduate Program — M.S. Degree

- Complete the following admissions requirement:
 - Complete a baccalaureate degree with a 3.0 GPA.
- Complete the general university requirements (page 202).
- Complete the master's degree requirements (page 206).

4. At least 21 credits must be earned in science and mathematics. At least 12 credits must be earned in the major discipline selected. A thesis (maximum of 3 credits) or project (no credit) must be completed in the major discipline. It is not intended that the individual courses comprising the program 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.
5. Minimum credits required 30
See Physics, Applied.
See Physics, Computational.
See Physics.
See Physics, Space.

GEOLOGICAL ENGINEERING

College of Engineering and Mines
Department of Mining and Geological Engineering
907-474-7388
www.uaf.edu/cem/ge/

M.S. Degree

Minimum Requirements for Degree: 30 – 33 credits

Geological engineering deals with the application of geology. Geological engineers work with the 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.

The graduate program prepares students for employment with industry, consulting companies and government agencies.

Graduate Program — M.S. Degree

1. Complete a comprehensive entrance exam.
2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206).
4. Complete the thesis or non-thesis requirements:

Thesis

- a. Complete 12 credits from the following with a maximum of 6 credits from the selected research focus group:
Geotechnical Engineering Focus Area:
GE F440—Slope Stability 3
GE F665—Advanced Geological Materials Engineering 3
GE F666—Advanced Engineering Geology 3
GE F668—Tunneling Geotechniques 3
GE F671—Engineering Application of Digital Image Processing 3
Geoenvironmental Engineering Focus Area:
GE F610—Subsurface Hydrology 3
GE F620—Advanced Groundwater Hydrology 3
GE F622—Unsaturated Soil Geoengineering 3
GE F649—Hazardous and Toxic Waste Management 3
Georesource Engineering Focus Area
GE F631—Electron Microprobe Methods 3
GE F630—Advanced Applied Mining Geology 3
GE F633—Fluid Inclusion Methods in Mineral and Petroleum Exploration 3
GE F635—Advanced Geostatistical Applications 3
MIN F621—Advanced Mineral Economics 3
b. Geological engineering courses* and technical electives 11
c. Complete the following:
GE F692—Graduate Seminar 1
GE F699—Thesis 6
d. Minimum credits required 30
* Note: Geological engineering courses may be taken from any focus group that is approved by the graduate advisory committee.

Non-Thesis

- a. Complete 12 credits from the following with a maximum of 6 credits from the selected research focus group:
Geotechnical Engineering Focus Area:
GE F440—Slope Stability 3
GE F665—Advanced Geological Materials Engineering 3
GE F666—Advanced Engineering Geology 3
GE F668—Tunneling Geotechniques 3
GE F671—Engineering Application of Digital Image Processing 3
Geoenvironmental Engineering Focus Area:
GE F610—Subsurface Hydrology 3
GE F620—Advanced Groundwater Hydrology 3
GE F622—Unsaturated Soil Geoengineering 3
GE F649—Hazardous and Toxic Waste Management 3
Georesource Engineering Focus Area
GE F631—Electron Microprobe Methods 3
GE F630—Advanced Applied Mining Geology 3
GE F633—Fluid Inclusion Methods in Mineral and Petroleum Exploration 3
GE F635—Advanced Geostatistical Applications 3
MIN F621—Advanced Mineral Economics 3
b. Geological engineering courses* and technical electives 14
GE F692—Graduate Seminar 1
GE F698—Research/Project 6
c. Minimum credits required 33
* Note: Geological engineering courses may be taken from any focus group that is approved by the graduate advisory committee.

GEOLOGY

College of Natural Science and Mathematics
Department of Geology and Geophysics
907-474-7565
www.uaf.edu/geology/

M.S., Ph.D. Degrees

Minimum Requirements for Degrees: M.S.: 30 credits;
Ph.D.: 18 thesis credits

Graduates in geology have broad backgrounds in the earth sciences and firm foundations in mathematics, physics and chemistry. There are many concentrations available in the geological sciences, and the suggested curricula are intended to be flexible enough to allow students to pursue their own emphasis. The M.S. program is tailored to the special research and study interest of the student.

There are about 40 professional geoscientists in residence on campus and graduate students normally participate in the ongoing research of these professionals. Teaching and research assistantships are available to graduate students in many of these areas.

Graduate Program — M.S. Degree

Concentrations: Economic Geology; General Geology; Petroleum Geology; Quaternary Geology; Remote Sensing; and Volcanology

1. Complete the following admission requirements:
 - a. Submit GRE scores.
 - b. Complete a background at least to the level of a B.S. concentration in geology, geophysics or earth science.
2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206).
 - a. Complete 6 – 12 thesis credits.
 - b. Complete any deficiencies concurrently with this degree.
4. Submit a written thesis proposal; and pass a written or oral comprehensive examination.

5. Complete and submit a written thesis and pass an oral defense of thesis.
6. Complete one of the following concentrations:

Economic Geology

- a. Complete GEOS F675, GEOS F618 or equivalent; GEOS F418 or equivalent; 9 credits in applied geoscience; and at least one course in mineral economics or engineering management, as approved by the graduate advisory committee.
- b. Minimum credits required 30

General Geology

- a. Complete 12 credits at the F600-level as approved by the graduate advisory committee.
- b. Minimum credits required 30

Petroleum Geology

- a. Complete 12 credits of course work at the F600-level from courses in the following disciplines: structural geology, stratigraphy, sedimentology, geophysics and/or petroleum engineering, as approved by the graduate advisory committee.
- b. Minimum credits required 30

Quaternary Geology

- a. Complete 9 credits in Quaternary geology and at least one course in another area of Quaternary studies, as approved by the graduate advisory committee.
- b. Minimum credits required 30

Remote Sensing

- a. Complete GEOS F654 or GEOS F657 and 10 credits in remote sensing-related courses, as approved by the graduate advisory committee.
- b. Minimum credits required 30

Volcanology

- a. Complete 12 credits at the F600-level in volcanology-related courses, as approved by the graduate advisory committee.
- b. Minimum credits required 30

Graduate Program — Ph.D. Degree

1. Complete the following admission requirement:
 - a. Submit GRE scores.
2. Complete the general university requirements (page 202).
3. Complete the course work requirements for the appropriate M.S. concentration.
4. Complete the Ph.D. degree requirements (page 207).
5. As part of the Ph.D. degree requirements, complete the following:
 - a. Complete and pass a written and oral comprehensive examination.
 - b. Complete and submit a written thesis proposal for approval.
 - c. Complete a research program as arranged with the graduate advisory committee.
 - d. Complete 18 credits of thesis, write a thesis and pass an oral defense of thesis.
6. Minimum credits required 18

Note: In addition to courses listed under the geology and geophysics program, students should check the course listings under the College of Engineering and Mines and the marine science program.

Note: In addition to the facilities available directly through the instructional program, UAF has active research laboratories in the fields of seismology, volcanology, paleomagnetism, isotope geochronology, glaciology and ice physics in the Geophysical Institute (see Geophysical Institute under Research). These laboratories can frequently provide topics for M.S. and Ph.D. theses. Other laboratories are also available in other divisions on campus, as listed under Research Institutes and Centers, page 16.

GEOPHYSICS

College of Natural Science and Mathematics
Department of Geology and Geophysics
907-474-7565
www.uaf.edu/geology/

M.S., Ph.D. Degrees

Minimum Requirements for Degrees: M.S.: 30 credits;
Ph.D.: 18 thesis credits

The geophysics program at UAF specializes in several broad areas of research and is closely connected with the Geophysical Institute. Although much of the research conducted by geophysics faculty takes advantage of the geographic location of the university, the faculty have research projects on all continents. Students have the option to obtain a general geophysics degree or to choose one of three concentrations to focus their studies.

Graduate Program — M.S. Degree

Concentrations: Solid-Earth Geophysics; Snow, Ice and Permafrost Geophysics; Remote Sensing Geophysics

1. Complete the following admission requirements:
 - a. Submit GRE scores.
 - b. Complete a background at least to the level of a B.S. concentration in geology, geophysics or an appropriate physical science or engineering.
 - c. Complete MATH F302, MATH F314, MATH F421 and PHYS F220 or equivalent.
2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206).
 - a. Complete 6 – 12 thesis credits.
 - b. Complete any deficiencies concurrently with this degree.
4. Submit a written thesis proposal and pass an oral comprehensive examination centered on this proposal.
5. Complete and submit a written thesis and pass an oral defense of thesis.
6. Complete the following geophysics core requirements:

GEOS F631—Foundations of Geophysics	4
GEOS F482—Geological Sciences Seminar	1
7. Complete 6 credits from relevant graduate-level courses agreed by the advisory committee, or chose one of the following concentrations:

Solid-Earth Geophysics

- a. Complete 6 credits from the following:

GEOS F604—Seismology	3
GEOS F605—Geochronology	3
GEOS F607—Applied Seismology	3
GEOS F613—Global Tectonics	3
GEOS F655—Tectonic Geodesy	3
GEOS F671—Volcano Seismology	3
- b. Minimum credits required, including thesis/research credits ... 30

Snow, Ice and Permafrost Geophysics

- a. Complete 6 credits from the following:

GEOS F614—Ice Physics	3
GEOS F615—Sea Ice	3
GEOS F616—Permafrost	3
GEOS F617—Glaciers	3
- b. Minimum credits required, including thesis/research credits ... 30

Remote Sensing

- a. Complete 6 credits from the following:
 - GEOS F654—Visible and Infrared Remote Sensing 3
 - GEOS F657—Microwave Remote Sensing 3
 - GEOS F622—Digital Image Processing in the Geosciences 3
 - GEOS F434/F634—Remote Sensing of the Cryosphere 4
 - GEOS F484/F684—Remote Sensing Bi-Weekly Seminar 1
 - GEOS F676—Remote Sensing of Volcanic Eruptions 3
 - GEOS F639—InSAR and its Applications 3
 - ATM F413/F613—Atmospheric Radiation 3
- b. Minimum credits required, including thesis/research credits 30

Graduate Program — Ph.D. Degree

1. Complete the following admission requirement:
 - a. Submit GRE scores.
2. Complete a master's degree in geology, geophysics or an appropriate field of physical science or engineering.
3. Complete the general university requirements (page 202).
4. Complete the course work requirements for the appropriate M.S. concentration.
5. Complete the geophysics core requirements:
 - GEOS F482—Geological Sciences Seminar 1
 - GEOS F631—Foundations of Geophysics 4
6. Complete 3 credits each in two of the following advanced skills categories (total 6 credits):
 - a. Digital signal analysis and remote sensing
 - GEOS F654—Visible and Infrared Remote Sensing 3
 - GEOS F657—Microwave Remote Sensing 3
 - GEOS F622—Digital Image Processing in the Geosciences 3
 - PHYS F628—Digital Time Series Analysis 3
 - b. Statistics and parameter estimation
 - ATM F693—Analysis Methods in Meteorology and Climate 3
 - GEOS F609—Inverse Problems and Parameter Estimation 3
 - STAT F401—Regression and Analysis of Variance 3
 - STAT F461—Applied Multivariate Statistics 3
 - c. Numerical methods
 - MATH F615—Applied Numerical Analysis 3
 - MATH F661—Optimization 3
 - MATH F694—Numerical Linear Algebra 3
 - ME F601—Finite Element Analysis in Engineering 3
7. One graduate-level advanced skills course approved by the student's advisory committee
8. Complete the Ph.D. degree requirements (page 207).
9. As part of the Ph.D. degree requirements, complete the following:
 - a. Complete and pass a written and oral comprehensive examination.
 - b. Complete and submit a written thesis proposal for approval.
 - c. Complete a research program as arranged with the graduate advisory committee.
 - d. Complete 18 credits of thesis, write a thesis and pass an oral defense of thesis.
10. Minimum credits required 18

Admission to Ph.D. geophysics program directly from a bachelor's program:

Entering graduate students whose highest earned degree is the baccalaureate are normally admitted as master of science candidates. However, exceptionally able and accomplished students in this category are eligible for direct admission to the Ph.D. program. For direct admission from the baccalaureate to the Ph.D. program, a student must receive approval from the graduate admission committee and also meet one of three criteria:

- a. At least one first-authored manuscript published, accepted, or submitted for publication in a peer-reviewed scientific journal

- b. Receipt of an NSF, NIH or similar prestigious pre-doctoral fellowship.
- c. Demonstrated research proficiency AND either (1) attained a GPA of at least 3.5 in mathematics and science courses at the undergraduate level, or (2) scored at or above the 80th percentile in two of three categories in the GRE. The requirement of demonstrated research proficiency can be waived for exceptionally promising students. In this case the student is required to complete a research or review paper focusing on a thesis-related topic approved by the graduate advising committee. The paper should be roughly 4,000 – 5,000 words and must be submitted and approved by the advising committee within the first three semesters to maintain Ph.D. status. Failure will result in changing the student's status to M.S. candidate.

After admission, M.S. candidates may, in exceptional cases, petition for conversion to the Ph.D. program if they satisfy one of the above criteria. Such petitions must be approved both by the student's current (M.S.) and proposed (Ph.D.) advisory committee and the department director or designee.

INDIGENOUS STUDIES

College of Liberal Arts
College of Rural and Community Development
School of Education
907-474-7464
www.uaf.edu/cxcs/indigenoussphd/

Ph.D. Degree

Minimum Requirements for Degree: 48 credits

Indigenous studies doctoral candidates will participate in research activities across a variety of UAF academic disciplines and applied fields. Students are encouraged to engage in comparative studies with other indigenous peoples around the world and to focus their dissertation research on issues of relevance to Alaska and the Arctic. Using the interdisciplinary Ph.D. model of academic assignment, the student's home base will be in the school or college of the student's major advisor, who also serves as an affiliate faculty member for the program.

The program objectives and its curriculum center around five thematic areas of study: indigenous studies/research, indigenous knowledge systems, indigenous education/pedagogy, indigenous languages and indigenous leadership. Students may focus on one of these areas or draw on multiple themes in collaboration with their graduate committee to develop their areas of knowledge and dissertation research. In collaboration with the graduate committee, each student will develop a program of course work and research that produces a unique intellectual contribution to the applied fields associated with Indigenous Studies.

Graduate Program — Ph.D. Degree

1. Complete the general university requirements (page 202).
2. Complete the Ph.D. degree requirements (page 207).
 - a. Complete required and elective courses.
 - b. Complete the following:
 - ANL/CCS/ED/RD F608—Indigenous Knowledge Systems 3
 - ANL/CCS/ED/RD F690—Seminar in Cross-Cultural Studies 3
 - c. Complete two of the following core courses:
 - ANL F601—Seminar in Language Revitalization 3
 - ANTH F631—Language and Culture Seminar 3
 - ANTH F646—Economic Anthropology 3
 - ANTH/BIOL/ECON/NRM F647—Regional Sustainability 3
 - ANTH/BIOL/ECON/NRM F649—Integrated Assessment and Adaptive Management 3

ANTH/NORS F610—Northern Indigenous Peoples and Contemporary Issues.....	3
CCS F602—Cultural and Intellectual Property Rights.....	3
CCS/ED F610—Education and Cultural Processes.....	3
CCS/ED F611—Culture, Cognition and Knowledge Acquisition.....	3
CCS F612—Traditional Ecological Knowledge.....	3
ED/LING F621—Cultural Aspects of Language Acquisition.....	3
ED F616—Education and Socio-Economic Change.....	3
ED F620—Language, Literacy and Learning.....	3
ED F660—Educational Administration in Cultural Perspective.....	3
RD F600—Circumpolar Indigenous Leadership Symposium.....	3
RD F601—Political Economy of the Circumpolar North.....	3
RD F651—Management Strategies for Rural Development.....	3
RD F652—Indigenous Organization Management.....	3
d. Complete two of the following research courses:	
ANTH F624—Analytical Techniques.....	3
ANTH F637—Methods in Ethnohistorical Research.....	3
CCS F601—Documenting Indigenous Knowledge.....	3
CCS/ED F603—Field Study Research Methods.....	3
RD F650—Community-Based Research Methods.....	3
e. Complete four specialty elective courses.....	12
f. Complete doctoral dissertation	
ANL/CCS/ED/RD F699—Thesis.....	18
3. Minimum credits required.....	48

Completion of 18 distance credits will constitute residency.
Note: Recommended additional academic experience:
Students are encouraged to enroll in a minimum of one semester of course work at a partner institution with program offerings related to their area of specialization. Students are encouraged to make at least one formal academic presentation at a statewide, national or international meeting, as well as a community-level presentation in Alaska. Students are encouraged to study a language other than English, as appropriate for the thematic area in which they are enrolled.

INTERDISCIPLINARY STUDIES

Office of the Graduate School and Interdisciplinary Programs
 907-474-7464
 fygrads@uaf.edu
www.uaf.edu/gradsch/classes/interdisciplinary-program/

M.A., M.S., Ph.D. Degrees

Minimum Requirements for Degrees: M.A. and M.S.: 30 credits;
 Ph.D.: 18 thesis credits

The UAF interdisciplinary program provides flexibility to students who have well-defined goals that do not fit into one of the established majors offered by the university. Interdisciplinary Studies is located in the Graduate School office. Help with the application process, contact information for faculty advisors and assistance for interdisciplinary students is available at 907-474-7464 or see www.uaf.edu/gradsch/classes/interdisciplinary-program/.

Graduate Program — M.A. or M.S. degree

- Complete the admission process including the following:
 - Submit GRE scores
 - In consultation with a UAF faculty member: prepare and submit a statement of research goals and justification for interdisciplinary approach, and a preliminary graduate study plan.
- Complete the general university requirements (page 202).
- Complete the master's degree requirements (page 206).
- Pass a comprehensive examination.
- Minimum credits required..... 30

Graduate Program — Ph.D. degree

- Complete the admission process including the following:
 - Submit GRE scores
 - In consultation with a UAF faculty member: prepare and submit a statement of research goals and justification for interdisciplinary approach, and a preliminary graduate study plan.
- Complete the general university requirements (page 202).
- Complete the Ph.D. degree requirements (page 207).
- Pass written and oral comprehensive exams.
- Minimum credits required..... 18

JUSTICE, ADMINISTRATION OF

College of Liberal Arts
 Justice Program
 907-474-5500
www.uaf.edu/justice/

M.A. Degree

Minimum Requirements for Degree: 30 credits

The justice discipline represents a melding of theoretical and applied concepts, and the M.A. degree in administration of justice reflects that dichotomy. Consequently, students explore theoretical models associated with different aspects of the criminal justice system, but also study the structure and administration of the criminal justice system.

The M.A. degree in administration of justice has been designed as a web-based degree program in order to accommodate the needs of justice professionals for whom taking a two-year leave of absence from their profession is not feasible, or for whom relocating to the Fairbanks vicinity is not possible. The M.A. degree program has attracted justice professionals from throughout the country who have found the flexibility of a web-based format useful.

Graduate Program — M.A. Degree

- Complete the general university requirements (page 202).
- Complete the master's degree requirements (page 206).
- Complete a minimum of 18 graduate UAF credits.
- Receive a passing grade on a written comprehensive exam administered on the UAF campus in conjunction with attendance in JUST F690.
- Receive a passing grade on an oral defense examination of a thesis or project.
- Complete a thesis or project.
- Complete the following:

JUST F605—Administration and Management of Criminal Justice Organizations.....	3
JUST F615—Justice Program Planning/Evaluation and Grant Writing.....	3
JUST F620—Personnel Management in Criminal Justice.....	3
JUST F625—Legal Aspects of Criminal Justice Management.....	3
JUST F640—Community/Restorative Justice.....	3
JUST F690—Seminar in Critical Issues and Criminal Justice Policy.....	3
JUST F698/F699—Master's Project or Thesis.....	6

8. Complete 6 credits from the following:

JUST F610—Ethics in Criminal Justice Management.....	3
JUST F630—Media and Community Relations for Criminal Justice Administrators.....	3
JUST F650—Analysis Techniques for the Criminal Justice Administrator	3
JUST F670—Seminar in the Administration of Juvenile Justice.....	3
9. Minimum credits required

LING F627—Description and Documentation.....	3
LING F630—Historical Linguistics.....	3
LING F631—Field Methods I.....	3
LING F634—Field Methods II.....	3
LING F650—Language Policy and Planning	3

- c. Complete two electives approved by graduate committee.

Language Documentation

- a. Complete the following:

LING F603—Phonetics and Phonology.....	3
LING F604—Morphology and Syntax.....	3
LING F627—Description and Documentation.....	3
LING F631—Field Methods I.....	3
LING F634—Field Methods II.....	3
- b. Complete one elective approved by graduate committee.

Second Language Acquisition Teacher Education

- a. Complete the following:

LING F602—Second Language Acquisition.....	3
LING F610—Theory and Methods of Second Language Teaching	3
 - b. Complete three of the following:

LING F611—Curriculum and Materials Development.....	3
LING F612—Language Assessment	3
LING F650—Language Policy and Planning	3
LING F660—Internship.....	3
 - c. Complete one elective approved by graduate committee.
5. Complete one of the following:

LING F698—Research (6)	
or LING F699—Thesis (6).....	6
 6. Minimum credits required

LINGUISTICS, APPLIED

College of Liberal Arts
Linguistics Program
907-474-6585
www.uaf.edu/linguist/

M.A. Degree

Minimum Requirements for Degree: 30 credits

Linguistics is the study of language and covers a variety of subjects including theories of grammar and how we produce language. It has a number of applications, including language teaching, teaching of English as a second or foreign language, and documentation of endangered languages.

Graduate students in applied linguistics may pursue a general program or develop a concentration in either language documentation or second language acquisition and teacher education. Students are expected either to have or to develop proficiency in at least one language other than English, as demonstrated by a proficiency exam or a comparable measure determined by the student's graduate committee. Students pursuing certification in Second Language Acquisition and Teacher Education must demonstrate proficiency in the language they intend to teach.

The general program provides students with a practical foundation in linguistics but remains broad enough to allow exploration of a variety of possible thesis topics.

Language documentation is designed to provide practical foundations in linguistics, techniques of fieldwork and documentation, with special focus on Alaska Native languages.

Second Language Acquisition and Teacher Education is designed for students interested in teaching English as a second language, a foreign or Alaska Native language. It is designed to provide theoretical and practical foundations in second language acquisition, language teaching, materials development, and language assessment.

Graduate Program — M.A. Degree

1. Complete the general university requirements (page 202).
2. Complete the master's degree requirements (page 206).
3. Complete the following core courses:

LING F600—Research Methods.....	3
LING F601—Principles of Linguistic Analysis.....	3
4. Complete one of the following concentrations:

General

 - a. Complete the following:

LING F602—Second Language Acquisition.....	3
LING F603—Phonetics and Phonology.....	3
LING F604—Morphology and Syntax.....	3
 - b. Complete three of the following:

LING F610—Theory and Methods of Second Language Teaching	3
LING F611—Curriculum and Materials Development.....	3
LING F612—Language Assessment	3
LING F620—Semantics	3

MARINE BIOLOGY

School of Fisheries and Ocean Sciences
Graduate Program in Marine Sciences and Limnology
907-474-7289
www.sfos.uaf.edu/academics/degrees/grad/marinebiology/

M.S., Ph.D. Degrees

Minimum Requirements for Degrees: M.S.: 30 credits;
Ph.D.: 18 thesis credits

The marine biology graduate program focuses on the ecology, physiology and biochemistry/molecular biology of marine organisms. Students may pursue either a M.S. or Ph.D. degree in marine biology. Graduate students are afforded excellent opportunities for laboratory and field research through the Institute of Marine Science. Laboratory facilities are available in Fairbanks, the Seward Marine Center, the Juneau Center, School of Fisheries and Ocean Sciences, the Kodiak Seafood and Marine Science Center and at the Kasitsna Bay Laboratory. Opportunities for field work are available on the R/V *Little Dipper*, which operates in Resurrection Bay.

Students may select courses offered by the graduate program in marine sciences and limnology, the fisheries program, the biology and wildlife department and the chemistry and biochemistry department.

Students considering graduate study in marine biology should have a strong background in biology, molecular biology or biochemistry. Students are admitted on the basis of their ability and the capability of the program to meet their particular interests and needs. Faculty review requests for admission throughout the year. Stipends for financial support are awarded competitively. Limited fellowship support is available. Most students are supported on research projects that relate directly to their degree research.

Graduate Program — M.S. Degree

1. Complete the following admission requirement:
 - a. Submit GRE scores.
2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206).
4. Complete a thesis.
5. Complete the following:

MSL F610—Marine Biology	3
MSL F615—Physiology of Marine Organisms	3
MSL F650—Biological Oceanography	3
MSL F651—Marine Biology and Ecology Field Course (4) or MSL F611—Field Problems in Marine Biology (5) or an equivalent field course at another institution.....	4 – 5
MSL F692—Seminar	3
6. Minimum credits required

Graduate Program — Ph.D. Degree

1. Complete the following admission requirement:
 - a. Submit GRE scores.
2. Complete the general university requirements (page 202).
3. Complete the Ph.D. degree requirements (page 207).
4. Complete course work at least equivalent to that required for the M.S. degree.
5. Minimum credits required 18

MATHEMATICS

College of Natural Science and Mathematics
Department of Mathematics and Statistics
907-474-7332
www.dms.uaf.edu

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

Minimum Requirements for Degrees: M.A.T.: 36 credits;
M.S.: 30 – 35 credits; Ph.D.: 18 thesis credits

The number of new fields in which professional mathematicians find employment grows continually. This department prepares students for careers in industry, government and education.

The M.S. in mathematics prepares students for Ph.D. work, in addition to providing a terminal degree for those planning to enter industry or education. The M.A.T. degree prepares graduates to teach secondary school mathematics. The aim of the Ph.D. program is to provide the student with the expertise to accomplish significant research in applied or pure mathematics, as well as to provide a broad and deep professional education.

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

The Department of Mathematics and Statistics also offers programs in statistics (see separate listings).

Graduate Program — M.A.T. Degree

1. Complete the following admission requirements:
 - a. Submit three letters of recommendation concerning the applicant's educational background and quantitative training.
 - b. Submit complete transcripts for all college-level work.
 - c. Submit a resume.
 - d. Submit a written statement of goals.
 - e. The department does not require any GRE, but recommends applicants provide GRE general scores.

- f. Complete and submit a TOEFL score of at least 600 (this requirement is only for foreign applicants who seek a teaching assistantship).
- g. The department gives preference to foreign applicants who also submit results of the Test of Spoken English.
2. Complete the general university requirements (page 202).
3. Complete the M.A.T. degree requirements (page 208).
4. Complete the following:

MATH courses*	18
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5. Minimum credits required 36
* At least 12 credits must be at the F600-level.

Graduate Program — M.S. Degree

1. Complete the following admission requirements:
 - a. Submit three letters of recommendation concerning the applicant's educational background and quantitative training.
 - b. Submit complete transcripts for all college-level work.
 - c. Submit a resume.
 - d. Submit a written statement of goals.
 - e. The department does not require any GRE, but recommends applicants provide GRE general scores.
 - f. Complete and submit a TOEFL score of at least 600 (this requirement is only for foreign applicants who seek a teaching assistantship).
 - g. The department gives preference to foreign applicants who also submit results of the Test of Spoken English.
2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206) including a written comprehensive exam.
4. Complete the following mathematics (core) courses:

MATH F631—Theory of Modern Algebra I	4
MATH F641—Real Analysis.....	4
MATH F645—Complex Analysis	4
MATH F651—Topology	4
5. Complete mathematics electives.
6. Complete a project or thesis.
7. Minimum credits required 30 – 35

Graduate Program — Ph.D. Degree

1. Complete the following admission requirements:
 - a. Submit three letters of recommendation concerning the applicant's educational background and quantitative training.
 - b. Submit transcripts indicating completion of a master's degree in mathematics or equivalent.
 - c. Submit a resume.
 - d. Submit a written statement of goals.
 - e. The department does not require any GRE, but recommends applicants provide GRE general scores.
 - f. Complete and submit a TOEFL. (For teaching assistantship consideration, foreign applicants whose native language is not English. Score of at least 600.)
 - g. The department gives preference to applicants who also submit results of the Test of Spoken English.
2. Complete the general university requirements (page 202).
3. Complete the Ph.D. degree requirements (page 207).
4. Minimum credits required 18

MECHANICAL ENGINEERING

College of Engineering and Mines
Department of Mechanical Engineering
907-474-7136
www.uaf.edu/cem/me/

M.S. Degree

Minimum Requirements for Degree: 30 credits

The mission of the mechanical engineering department at UAF is to offer the highest quality, contemporary education at undergraduate and graduate levels, and to perform research appropriate to the technical needs of the state of Alaska, the nation and the world.

Mechanical engineers conceive, plan, design and direct the manufacturing, distribution and operation of a wide variety of devices, machines and systems for energy conversion, environmental control, materials processing, transportation, materials handling and other purposes. Mechanical engineers are engaged in creative design, applied research, development and management.

The goals and objectives of the mechanical engineering program are to offer a mechanical engineering program designed to prepare its graduates for careers at the professional level; maintain, as a base, ABET accreditation of the undergraduate program; provide continuing educational opportunities for graduate engineers; serve as a resource of technical knowledge for the state as well as the nation; conduct research in all areas of mechanical engineering including cold regions mechanical engineering; and offer a graduate program in mechanical engineering at the M.S. and Ph.D. levels.

The educational objectives of the department are that graduates from the mechanical engineering program must be able to apply the knowledge of mathematics, science and engineering; be able to design and conduct experiments, as well as to analyze and interpret data; be able to design a system, component or process to meet desired needs; be able to function on multi-interdisciplinary teams; be able to identify, formulate and solve engineering problems; understand professional and ethical responsibility; be able to communicate effectively; have the broad education necessary to understand the impact of engineering solutions in a global and societal context; recognize the need for, and be able to engage in, life-long learning; understand contemporary issues; and be able to use the techniques, skills and modern engineering tools necessary for engineering practice. The department ensures that each course in the curriculum plays a meaningful role in satisfying one or more of these objectives.

Graduate Program — M.S. Degree

1. Complete the following admission requirement:
 - a. Submit GRE scores.
2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206).
4. Complete the following:

ME F631—Advanced Mechanics of Materials.....	3
ME F634—Advanced Materials Engineering.....	3
ME F641—Advanced Fluid Mechanics.....	3
ME F642—Advanced Heat Transfer	3
ME F608—Advanced Dynamics.....	3
5. Complete the thesis or non-thesis requirements:
Thesis
 - a. Complete the following:

ME F699—Thesis	6
Electives*	9
 - b. Minimum credits required

Non-Thesis

- a. Complete the following:

Electives*	12
ME F698—Project	3
 - b. Minimum credits required
- * ME or other engineering, science, or mathematics courses approved by the student's advisory committee.
See Engineering for Ph.D. degree program.

MINERAL PREPARATION ENGINEERING

College of Engineering and Mines
Department of Mining and Geological Engineering
907-474-7388
www.uaf.edu/cem/min/

M.S. Degree

Minimum Requirements for Degree: 30 – 36 credits

The mineral preparation engineering program offers specialization in the processes used to concentrate target minerals and remove undesirable material from mined ore. Interdisciplinary study of chemistry, physics, the geological sciences and engineering are integrated to allow the characterization, separation, agglomeration, extraction and handling of mineral particles.

Since large quantities of solid waste and process water are often produced as a result of mineral extraction, pollution control technology is also an important aspect of mineral preparation.

Students are prepared for career opportunities in the mineral industry, consulting and research firms, environmental industry, and investment and commodity firms in the private sector.

Graduate Program — M.S. Degree

1. Complete the general university requirements (page 202).
 2. Complete the master's degree requirements (page 206).
 3. Complete the following:

MIN F415—Coal Preparation	3
MPR F601—Froth Flotation.....	3
MPR F606—Plant Design	3
MPR F688—Graduate Seminar I	1
 4. Complete the thesis or non-thesis requirements:
Thesis
 - a. Complete the following:

MPR F699—Thesis	6
Technical electives.....	14
 - b. Minimum credits required
- Non-Thesis**
 - a. Complete the following:

MPR F698—Research/Project.....	6
Technical electives.....	20
 - b. Minimum credits required

MINING ENGINEERING

College of Engineering and Mines
Department of Mining and Geological Engineering
907-474-7388
www.uaf.edu/cem/min/

M.S. Degree

Minimum Requirements for Degree: 31 – 37

The mining engineering program emphasizes engineering as it applies to the exploration and development of mineral resources and upon the economics of the business of mining. The program offers specialization in exploration, mining or mineral beneficiation.

Students are prepared for job opportunities with mining and construction companies, consulting and research firms, equipment manufacturers, investment and commodity firms in the private sector, as well as with state and federal agencies.

Mining engineers may aspire to, and achieve, the highest positions in the industry: operating or engineering management, government agency director or entrepreneur.

Graduate Program — M.S. Degree

1. Complete the general university requirements (page 202).
2. Complete the master's degree requirements (page 206).
3. Complete the following:
MIN F688—Graduate Seminar I..... 1
4. Complete the thesis or non-thesis requirements:
Thesis
 - a. Complete the following:
MIN F600-level courses 12
Technical electives..... 11
MIN F699—Thesis 6
 - b. Minimum credits required 30**Non-Thesis**
 - a. Complete the following:
MIN courses..... 12
Technical electives..... 17
MIN F698—Research/Project..... 6
 - b. Minimum credits required 36

MUSIC

College of Liberal Arts
Department of Music
907-474-7555
www.uaf.edu/music/

M.A. Degree

Minimum Requirements for Degree: 30 credits

The academic content of the graduate program is determined by the student and his or her graduate advisory committee. Each graduate student's program is individually tailored and designed to meet the student's professional interests and aspirations, consistent with program requirements. (The UAF academic diploma will read: Master of Arts in Music. It will not display any reference to the student's area of music specialization.)

Recitals and concerts provide students with a variety of musical experiences which expand the regular curriculum.

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

Graduate Program — M.A. Degree in Music

Concentrations: Conducting, Music Education, Music History, Performance, Theory/Composition

1. Complete the following admission requirements:
 - a. Take an evaluative preliminary examination in music theory and history.*
 - b. Music education majors must complete an essay that includes 1) their philosophy of music education, and 2) a discussion of what they believe to be the most current issues in music education.
 - c. Composition majors must submit examples of previous work.
 - d. Performance majors must demonstrate acquaintance with solo literature of the various historical periods through audition or submission of performance tapes.
 2. Complete the general university requirements (page 202).
 3. Complete the master's degree requirements (page 206).**
 4. MUS F601—Introduction to Graduate Study 3
 5. MUS F625—Topics in Music History..... 3
or MUS F631—Seminar in Music Theory: History
and Pedagogy 3
 6. Two semesters of any music performance ensemble 2
 7. Six credits to be selected from MUS F421, MUS F422, MUS F423 or MUS F424.
 8. No more than 12 credits of MUS F697 allowed
 9. MUS F698—Research 6
 10. Twenty-one credits must be at F600-level. Optionally, no more than 9 credits of F400-level.
 11. Complete at least 16 credits in a primary area of specialization (includes research), with the balance in a secondary area.
 12. Students majoring in vocal performance or music history must demonstrate proficiency in languages appropriate to their area of concentration. Proficiency will be determined by the student's graduate committee in conjunction with the Department of Foreign Languages. Graduate students studying applied music and/or presenting recitals are governed by the same regulations concerning recital preparation, recital jury pre-hearings, and jury examinations as apply to undergraduate students. These regulations are described in the Music Handbook.
 13. Successfully complete comprehensive oral examination in music history and theory.
 14. Successfully complete oral defense of thesis, recital program notes, or project.
 15. Minimum credits required 30 (36 if thesis is included)
- * This preliminary exam, to help determine the areas of strength and deficiency, will cover the following areas: a) music theory, b) music history and literature, c) demonstration of keyboard proficiency, and d) performance ability. Applicants will be accepted from any accredited institution; before admission to a degree program, however, all students (including UAF graduates) must take these preliminary examinations.
- ** After completing about one semester of the program, students will meet with their advisory committee to define precisely the student's major area of specialization. Such specialization is not to be conceived narrowly as a thesis topic, but rather as a broad area in which the student plans to spend a significant amount of their study. Advisory meetings may be repeated until such time as the student has satisfactorily defined the area of specialization. Each student, with the approval of the advisory committee, shall develop an appropriate final project or thesis. A thesis is required for students majoring in music theory and music history. Performance majors must present a graduate recital and prepare a supporting paper on selected aspects of the recital.
- *** Private lessons at either the senior or graduate level. Committee may suggest further study if remedial work is deemed necessary.
- Note: All F600-level courses are restricted to graduate students; however graduate students may elect some of their courses from upper-division undergraduate courses (F300- or F400-level).

NATURAL RESOURCES AND SUSTAINABILITY

School of Natural Resources and Agricultural Sciences
School of Management
907-474-7188
www.uaf.edu/snras/
www.uaf.edu/som/

Ph.D. Degree

Minimum Requirements for Degree: 18 credits

The joint Ph.D. Program in natural resources and sustainability prepares future leaders as academic researchers, agency professionals and analysts of non-governmental organizations and communities for careers at the frontiers of science in the management of natural resources and environment.

Exploring and understanding natural resource management systems requires both a well-defined skill set and a clear understanding of how specific problems are linked to broader cultural, ecological and geopolitical contexts. Thus, the study of natural resources and sustainability encompasses a spectrum of topics. The Ph.D. builds on the existing strengths of the School of Natural Resources and Agricultural Sciences and School of Management faculty members to educate students in specific areas while training them to be conversant in the broader range of relevant topic areas.

The program objectives and its curriculum center around three thematic areas of study: 1) resource economics, 2) resource policy and sustainability science, and 3) forest and agricultural sciences. Each student draws on a common set of core courses, and with his/her graduate committee, develops a program of course work and research that produces a unique intellectual contribution to the applied field of natural resources and sustainability. Students elect to focus on one of the three thematic areas or they choose to integrate foci to develop their areas of knowledge and dissertation research.

Graduate Program — Ph.D. Degree

- 1. Complete the general university requirements (page 202).
- 2. Complete the Ph.D. degree requirements (page 207).
- 3. Complete course work in thematic area(s) as determined by the advisory committee.
- 4. Required and elective elements of the plan of study:
 - a. Complete the following core course requirements:
 - NRM 647—Global to Local Sustainability 3
 - NRM 649—Integrated Assessment and Adaptive Management..... 3
 - NRM 692—Natural Resources and Sustainability Ph.D. Seminar Complete two semesters..... 2
 - b. Outreach activity of one annual public presentation
 - c. Advancement to candidacy occurs when the student demonstrates mastery in understanding sustainability and in-depth knowledge of the student's dissertation research topic area. Requirements for advancement to candidacy are determined by the academic committee of the student, and shall be consistent with the candidacy requirements for Ph.D. studies at UAF. The basis of the evaluation will be written and oral comprehensive exams.
 - d. Dissertation defense seminar
 - e. Dissertation defense examination
 - f. Doctoral dissertation
- 5. Minimum credits required..... 26

NATURAL RESOURCES MANAGEMENT

School of Natural Resources and Agricultural Sciences
907-474-7083
www.uaf.edu/snras/

M.S., M.N.R.M.G. Degrees

Minimum Requirements for Degrees: M.S.: 30 credits;
M.N.R.M.G.: 35 credits

The two master's degrees offered by the School of Natural Resources and Agricultural Sciences are designed for students desiring careers in resources management and students planning doctoral work, as well as those wishing to be better-informed citizens. The courses and curriculum for the two degrees were developed in cooperation with groups and agencies that work professionally with resource management in Alaska. These agencies, including the Alaska Department of Natural Resources, Alaska Department of Fish and Game, Agricultural Research Service, U.S. Forest Service, Bureau of Land Management, Natural Resources Conservation Service, and U.S. Fish and Wildlife Service contribute significantly to the programs by providing guest lecturers and internship and research opportunities for students.

Because of the diversity and broad scope of the field, each degree is customized according to the student's interests and advisory committee's recommendations. Student research projects and theses have typically been in the fields of forest management, land use planning, soil management, natural resource policy, range management, parks and recreation management, horticulture, agronomy, animal science, climate change, and GIS.

A bachelor of science or bachelor of arts degree in a relevant discipline is required for acceptance into either program. Candidates should have general familiarity with the major resource fields. The student's committee may require the student to take courses to remedy any deficiencies; these credits will not count toward the credits required for the degree.

Applicants must submit three letters of recommendation, official GRE scores, undergraduate transcripts and a statement of the applicant's goals. The latter should include information about why you are applying for the degree, why you chose UAF and SNRAS, and how such a degree would fit into your career goals. Applications cannot be considered until all these items have been received by the Admissions Department.

The M.S. degree in natural resource management is designed for those intending to pursue a career conducting research in management problems and/or to proceed on to a doctoral program. Thesis research in natural resources management is directed toward resource problems and based on hypothesis testing.

The master's degree in natural resource management and geography is designed to prepare students for a management career in natural resources planning and administration; communication and public information; and/or operational innovation, improvement and impact assessment. While not requiring scientific research, the work is expected to involve critical reflection, empirical inquiry and intellectual honesty. A written product (an "opus") and an oral presentation demonstrating sound scholarship will be required. Final acceptance of the project will be by the student's committee and the associate dean of SNRAS.

Graduate Program — M.S. Degree

- 1. Complete the general university requirements (page 202).
- 2. Complete the master's degree requirements (page 206).

3. Complete the following:
 NRM F601—Research Methods in Natural Resources 2
 or an approved research methods course*
 NRM F692—Graduate Seminar 3
 NRM F699—Thesis 6 – 12
 Statistics course at the F400-level or above** 3
 4. Additional approved courses as needed to total 30 credits (these courses will be approved by the student's committee). Up to 6 of these credits may be 400-level courses.
 5. Complete and successfully defend the thesis.
 6. Minimum credits required 30
- * Requirement may be met with a research methods course in a discipline related to natural resources management.
- ** Requirement may be met with a statistics course in mathematical sciences or in a discipline related to natural resources management.

Graduate Program — M.N.R.M.G. Degree

1. Complete the general university requirements (page 202).
 2. Complete the master's degree requirements (page 209).
 3. Complete the following:
 NRM F601—Research Methods in Natural Resources (2)
 or an approved research methods course* 2
 NRM F692—Graduate Seminar 3
 NRM F698—Non-thesis research/project 6
 Statistics course at the F400-level or above** 3
 4. Additional approved courses as needed to total 35 credits (these courses will be approved by the student's committee and the SNRAS dean). Up to 9 of these credits may be 400-level courses.
 5. Complete and successfully defend the opus.
 6. Minimum credits required 35
- * Requirements may be met with a research methods course in a discipline related to natural resources management.
- ** Requirements may be met with a statistics course in mathematical sciences or in a discipline related to natural resources management.

NORTHERN STUDIES

College of Liberal Arts
 907-474-7126
 Interdisciplinary
www.uaf.edu/northern/

M.A. Degree

Minimum Requirements for Degree: 30 credits

The northern studies program offers an interdisciplinary study of northern problems and policy issues. 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 geographic location of UAF is outstanding for the study of northern issues. Students examine the countries and regions throughout the circumpolar North, and their distinctive problems, such as the survival of indigenous populations, environmental and wilderness issues, high rates of alcoholism and suicide, fragile environments, adaptation to extreme cold and cycles of light and darkness and adult development in small frontier societies.

The M.A. program is designed especially for students who live and work in the North and who want to expand their knowledge of the history, economics, politics, psychology and anthropology of northern regions. Many northern studies students are seeking employment with northern agencies and want to develop a broad perspective on northern issues. Some students plan to pursue doctoral work in a discipline such as history or anthropology and seek a master's degree with a broad approach. Other students are employed as teachers, military personnel, or agency staff and want a

rich, interdisciplinary program. The program is suitable for any of these goals, and it is designed to be compatible with either full-time graduate study or full-time employment.

The M.A. program offers three concentrations: northern history, environmental politics and policy, and individualized study. Students of northern history benefit from the availability of the Alaska and circumpolar collections of the UAF library, UA Museum of the North, and the Polar Regions Collection. The environmental politics and policy concentration focuses on political, social and psychological responses to environmental change. The individualized study concentration has a focus selected by the student.

The program offers a thesis or non-thesis option. The choice of option is guided by the student's interests and goals, the graduate advisory committee, and the requirements of the university. Faculty in the program are drawn from such disciplines as Alaska Native studies, art, anthropology, economics, English, geography, history, library science, political science and psychology.

For information on studying at McGill University, Montreal, Canada; the University of Copenhagen, Denmark; or opportunities for study in the former U.S.S.R., see International Study Abroad and Exchange Programs on page 80.

Graduate Program — M.A. Degree

Concentrations: Individualized Study, Environmental Politics and Policy, and Northern History

1. Complete the general university requirements (page 202).
2. Complete the master's degree requirements (page 206).
3. Complete the following
 NORS F600—Perspectives of the North 3
 NORS F601—Research Methods and Sources in the North 3
4. Complete two elective courses at the F400- or F600-level 6
5. Complete one of the following:
 NORS F698—Project 6
 NORS F699—Thesis 6 – 12
6. Complete one of the following concentrations:

Individualized Study*

Complete 12 credits from the following:

- a. Course offerings selected from the relevant department** and,
- b. Courses offered within the Northern Studies program, including those in the other concentrations (below) and,
- c. Any of the following:
 NORS F606—Science, Technology and Development in
 Northern Regions 3
 NORS F614—Human Adaptation to the Circumpolar North 3
 NORS F640—Ethics and Reporting in the Far North 3
 NORS F652—International Relations of the North 3
 NORS F660—Government and Politics of Canada 3
 NORS F662—Alaska Government and Politics 3
 NORS F668—Government and Politics of Russia 3
 NORS F680—Comparative Education 3

* The individualized study concentration may be used as a basis for a M.A. thesis/project typically under the direction of a faculty member in the most relevant department.

** Some students may, with the consent of their graduate committee, develop an individualized program with an emphasis on Alaska Native studies, northern art, northern sociology, northern policy studies, or another northern field or discipline.

Environmental Politics and Policy*

Complete 12 credits from the following:

- NORS/PS F603—Public Policy 3
- NORS/PS F647—U.S. Environmental Policy 3
- NORS F648—Environmental Politics of the
 Circumpolar North 3
- NORS/PS F654—International Law and the Environment 3

- NORS/PS F655—Political Economy of the Global Environment 3
- NORS/PS F656—Science, Technology and Politics 3
- NORS/PS F658—Comparative Environmental Politics 3
- NORS F613—Wilderness and Environmental Psychology 3
- * *The environmental politics and policy concentration may be used as a basis for the M.A. thesis/project.*
- Note: The environmental politics and policy concentration is a clear track toward interdisciplinary doctoral programs.*
- Northern History***
- a. Complete the following:
- NORS/HIST F690—Researching and Writing Northern History 3
- b. Complete 9 credits from the following:
- HIST F470—Seminar in Alaska History 3
- NORS F661/HIST F662—History of Alaska 3
- NORS/HIST F663—Foundations of Russian History 3
- NORS/HIST F664—Modern Russia 3
- NORS/HIST F681—Polar Exploration and its Literature 3
- NORS/HIST F683—20th Century Circumpolar History 3
- * *The northern history concentration may be used for the M.A. thesis/project.*
7. Minimum credits required 30

OCEANOGRAPHY

School of Fisheries and Ocean Sciences
Graduate Program in Marine Sciences and Limnology
907-474-7289
www.sfos.uaf.edu/academics/degrees/grad/oceanography/

M.S., Ph.D. Degrees

Minimum Requirements for Degrees: M.S.: 30 credits;
Ph.D.: 18 thesis credits

This program offers M.S. degrees in several concentration areas of oceanography: physical, chemical, biological, geological and fisheries. Limnological research projects are also undertaken under the oceanography degree. The Ph.D. degree is offered in oceanography.

Opportunities for laboratory and field work are available through the School of Fisheries and Ocean Sciences, including the Institute of Marine Science. These include laboratories in Fairbanks, the Seward Marine Center, Kasitsna Bay, the Juneau Center and the Kodiak Seafood and Marine Science Center. Research vessels operated by the institute and school include the R/V *Little Dipper*, which operates on day trips in Resurrection Bay. Laboratory facilities include a seawater system at Seward and a variety of modern and analytical instrumentation, including stable isotope mass spectrometers, a gamma spectrometer, a flow cytometer facility, and gas and liquid chromatography equipment. Mainframe and personal computing facilities are readily accessible to graduate students.

Oceanography is both interdisciplinary and multidisciplinary. For both M.S. and Ph.D. oceanography students, research emphasis is on processes influencing the ocean's circulation, composition, biological productivity and geology. Students considering graduate study in oceanography should have a strong background in physics, chemistry, biology, geology or mathematics, and a working familiarity with the other subjects.

Graduate Program — M.S. Degree

Concentrations: Biological, Chemical, Fisheries, Geological, Physical

- Complete the following admission requirement:
 - Submit GRE scores.
- Complete the general university requirements (page 202).

- Complete the master's degree requirements (page 206).
- Complete one of the following concentrations:

Biological, Chemical, Geological, Physical

- Complete the following:

MSL F620—Physical Oceanography	3
MSL F630—Geological Oceanography	3
MSL F650—Biological Oceanography	3
MSL F660—Chemical Oceanography	3
MSL F692—Seminar	3
MSL F699—Thesis*	open
Electives*	open
- Minimum credits required 30

* *Appropriate to area of concentration*

Fisheries

- Complete the following:

MSL F620—Physical Oceanography	3
MSL F630—Geological Oceanography	3
MSL F640—Fisheries Oceanography	4
MSL F650—Biological Oceanography	3
MSL F660—Chemical Oceanography	3
MSL F692—Seminar	3
MSL F699—Thesis	open
Electives	open
- Minimum credits required 30

Graduate Program — Ph.D. Degree

- Complete the following admission requirement:
 - Submit GRE scores.
- Complete the general university requirements (page 202).
- Complete the Ph.D. degree requirements (page 207).
- Complete course work equivalent to M.S. degree.*
- Minimum credits required 18

* *There are no fixed course requirements, nor is an M.S. degree required to earn the Ph.D. degree. However, a candidate for the Ph.D. degree in oceanography (biological, chemical, fisheries, geological, and physical oceanography) will be expected to have completed course work at least equivalent to that required for the corresponding M.S. degree.*

Note: Students are admitted to the graduate program in marine sciences and limnology on the basis of their ability and the capability of the program to meet their particular interests and needs. Applications are considered throughout the year but students should apply by March 1 to have the best chance for admission and financial support for the subsequent fall semester. Assistantship stipends are awarded competitively and limited fellowship support is available. Most students are supported on research projects that relate directly to their degree research.

Note: Oceanography majors must demonstrate field experience aboard an oceanographic vessel.

PETROLEUM ENGINEERING

College of Engineering and Mines
Department of Petroleum Engineering
907-474-7734
www.uaf.edu/cem/pete/

M.S. Degree

Minimum Requirements for Degree: 30 – 36 credits

Petroleum engineering offers a unique look at the challenging problems confronting the petroleum industry. This program requires an understanding of many disciplines including mathematics, physics, chemistry, geology and engineering science. Courses in petroleum engineering deal with drilling, formation evaluation, production, reservoir engineering, computer simulation and enhanced oil recovery.

The curriculum prepares graduates to meet the demands of modern technology while emphasizing, whenever possible, the special problems encountered in Alaska. Located in one of the largest oil-producing states in the nation, the UAF petroleum engineering department offers modern and challenging degree programs.

The M.S. program is intended to provide students with an advanced treatment of petroleum engineering concepts. Students may choose either a thesis or non-thesis option. Research and teaching assistantships are available.

A doctoral degree program is offered with concentration in petroleum engineering for qualified students (see Engineering). Contact the graduate program coordinator or the petroleum engineering department for more information.

Graduate Program — M.S. Degree

- Complete the following admission requirement:
 - Complete a B.S. degree in engineering or the natural sciences.
- Complete the general university requirements (page 202).
- Complete the master's degree requirements (page 206).
- Complete the thesis or non-thesis requirements:

Thesis

- Complete four of the following:

PETE F607—Advanced Production Engineering.....	3
PETE F610—Advanced Reservoir Engineering	3
PETE F621—Applied Reservoir Characterization	3
PETE F630—Water Flooding.....	3
PETE F656—Advanced Petroleum Economic Analysis	3
PETE F661—Applied Well Testing	3
PETE F662—Enhanced Oil Recovery.....	3
PETE F663—Applied Reservoir Simulation.....	3
PETE F665—Advanced Phase Behavior	3
PETE F666—Drilling Optimization.....	3
PETE F670—Fluid Flow Through Porous Media.....	3
PETE F680—Horizontal Well Technology.....	3
PETE F683—Natural Gas Processing and Engineering	3
PETE F684—Computational Methods in Petroleum Engineering.....	3
PETE F685—Non-Newtonian Fluid Mechanics	3
PETE F689—Multiphase Fluid Flow in Pipes.....	3
- Complete the following:

PETE F699—Thesis.....	6
Elective courses*.....	12
- Minimum credits required.....

Non-Thesis

- Complete four courses from those in the thesis option.
- Complete the following:

PETE F698—Engineering Project	6
Electives*	18
- Minimum credits required.....

* Electives are chosen with approval of graduate advisory committee.

PHYSICS

College of Natural Science and Mathematics
Department of Physics
907-474-7339
www.uaf.edu/physics/

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

Minimum Requirements for Degrees: M.S.: 30 – 33 credits;
M.A.T.: 36 credits; Ph.D.: 18 thesis credits

The science of physics is concerned with the nature of matter and energy in all physical systems, from elementary particles to the

structure and origin of the universe. Physics, together with mathematics and chemistry, provides the foundation for work in all fields of the physical sciences and engineering, and contributes greatly to other disciplines such as the biosciences and medicine.

Advanced study at the graduate level is offered in various areas of physics and applied physics, including many of the research specialties found at the UAF's Geophysical Institute. Faculty and student research programs currently emphasize investigations of auroral, ionospheric, magnetospheric and space plasma physics, the physics and chemistry of the upper and middle atmosphere, radio-wave propagation and scattering, solar-terrestrial relations, condensed matter physics, complex dynamics of non-linear systems, ice physics and infrasonics.

The physics department is also responsible for the graduate degree programs in general science, computational physics and space physics. These programs are also described in this catalog.

Graduate Program — M.S. Degree

- Complete the general university requirements (page 202).
- Complete the master's degree requirements (page 206).
- Complete the thesis or non-thesis requirements:

Thesis

- Complete the following:

PHYS F699—Thesis.....	6 – 12
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- Complete four of the following:

PHYS F611—Mathematical Physics I.....	3
PHYS F612—Mathematical Physics II	3
PHYS F621—Classical Mechanics	3
PHYS F622—Statistical Mechanics.....	3
PHYS F631—Electromagnetic Theory	3
PHYS F632—Electromagnetic Theory	3
PHYS F651—Quantum Mechanics	3
PHYS F652—Quantum Mechanics	3
- Complete 12 credits from the following:

Approved PHYS F600-level courses	
Approved ATM F600-level courses	
- Minimum credits required.....

Non-Thesis

- Complete the following:

PHYS F698—Research	3 – 6
Approved courses	18
- Complete four of the following:

PHYS F611—Mathematical Physics I.....	3
PHYS F612—Mathematical Physics II	3
PHYS F621—Classical Mechanics	3
PHYS F622—Statistical Mechanics.....	3
PHYS F631—Electromagnetic Theory	3
PHYS F632—Electromagnetic Theory	3
PHYS F651—Quantum Mechanics	3
PHYS F652—Quantum Mechanics	3
- Minimum credits required*

* At least 30 credits must be regular course work.

Graduate Program — M.A.T. Degree

- Complete the general university requirements (page 202).
- Complete the M.A.T. degree requirements (page 208).
- Contact the department head for specific degree requirements.
- Minimum credits required.....

Graduate Program — Ph.D. Degree

- Complete the general university requirements (page 202).
- Complete the Ph.D. degree requirements (page 207).*

3. Complete and pass a written and oral comprehensive examination.
4. Minimum credits required 18
- * *Complete in accordance with physics department's policies and procedures manual for graduate students.*
See General Science.
See Physics, Computational.
See Physics, Space.

PHYSICS, COMPUTATIONAL

College of Natural Science and Mathematics
Department of Physics
907-474-7339
www.uaf.edu/physics/

M.S. Degree

Minimum Requirements for Degree: 30 – 33 credits

Computational modeling and simulations have become powerful tools in many science disciplines. For example, computational physics includes numerical modeling and computer simulations for physical processes in Earth's upper atmosphere and space environment, and for complex (non-linear) biological and physical systems.

Computational physics requires expertise in advanced computing environments, in the relevant mathematical foundations and in the specific physics discipline. This M.S. degree program is directed toward students with undergraduate academic backgrounds in physics or other closely associated fields, such as engineering, that have the appropriate physics course work. This degree is relevant for students seeking careers in any areas that require expertise in the modeling and simulation of physical systems.

Graduate Program — M.S. Degree

1. Complete the following admissions requirements:
 - a. Complete a B.S. degree in physics.
 - b. Complete MATH F421 and MATH F422.
2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206).
4. Complete the thesis or non-thesis requirements:

Thesis Option

 - a. Complete the following

PHYS F611—Mathematical Physics I.....	3
PHYS F612—Mathematical Physics II	3
PHYS F629—Methods of Numerical Simulation in Fluids and Plasma	3
PHYS F699—Thesis.....	6 – 12
 - b. Complete approved PHYS F600-level courses 6
 - c. Complete at least 3 credits from the following:

Approved MATH F600-level courses (excluding MATH/PHYS F611 and F612)	3
Approved CS F600-level courses	3
 - d. Minimum credits required* 30

* At least 24 credits must be from regular course work for thesis option.

Non-Thesis Option

- a. Complete the following

PHYS F611—Mathematical Physics I.....	3
PHYS F612—Mathematical Physics II	3
PHYS F629—Methods of Numerical Simulation in Fluids and Plasma	3
PHYS F698—Research	3 – 6
- b. Complete approved PHYS F600-level courses 9

- c. Complete at least 3 credits from the following:

Approved MATH F600-level courses (excluding MATH/PHYS F611 and F612)	3
Approved CS F600-level courses	3
 - d. Minimum credits required* 33
- * At least 30 credits must be from regular course work for non-thesis option.
See Physics.
See Physics, Space.

PHYSICS, SPACE

College of Natural Science and Mathematics
Department of Physics
907-474-7339
www.uaf.edu/physics/

M.S., Ph.D. Degrees

Minimum Requirements for Degrees: M.S.: 30 – 33 credits;
Ph.D.: 18 thesis credits

Space physics focuses on the physics of upper atmospheres, ionospheres, magnetospheres and the interplanetary medium. It includes core physics courses and specialty courses in space physics, aeronomy, magnetospheric and auroral physics, and advanced plasma physics. The specialty courses support graduate research with faculty members at UAF's Geophysical Institute, and include areas such as numerical simulations and time-series analysis. Additional courses such as radiative transfer and physics of fluids provide added breadth.

Graduate Program — M.S. Degree

1. Complete the general university requirements (page 202).
2. Complete the master's degree requirements (page 206).
3. Complete four of the following:

PHYS F626—Fundamentals of Plasma Physics.....	3
PHYS F627—Advanced Plasma Physics.....	3
PHYS F629—Methods of Numerical Simulation in Fluids and Plasma	3
PHYS F672—Magnetospheric Physics	3
PHYS F673—Space Physics.....	3
4. Complete the thesis or non-thesis requirements:

Thesis

- a. Complete the following:

PHYS F699—Thesis.....	6 – 12
Approved PHYS electives.....	12
- b. Minimum credits required 30 – 33

Non-Thesis

- a. Complete the following:

Approved PHYS electives.....	18
PHYS F698—Research	3 – 6
- b. Minimum credits required 30 – 33

Graduate Program — Ph.D. Degree

1. Complete the general university requirements (page 202).
 2. Complete the Ph.D. degree requirements (page 207).*
 3. Complete and pass a written and oral comprehensive examination.
 4. Minimum credits required 18
- * *Complete in accordance with the physics department's policies and procedures manual for graduate students.*
See Physics.

PSYCHOLOGY, CLINICAL-COMMUNITY

College of Liberal Arts
Department of Psychology
907-474-7012
UAF-PSYPHD@alaska.edu
ayphd@uaa.alaska.edu
<http://psyphd.alaska.edu>

Ph.D. Degree

Minimum Requirements for Degree: 115 credits

The Ph.D. program in Clinical-Community Psychology is accredited by the American Psychological Association as a clinical psychology program.

The Ph.D. program in Clinical-Community Psychology with a Rural, Indigenous Emphasis is a partnership between the departments of psychology at UAF and UAA. Although the degree is awarded by UAF, students can complete the entire degree program at either campus. All program courses are co-taught across campuses via video conference and all program components are delivered by faculty at both campuses. The student experience is identical regardless of students' city of residence (Fairbanks or Anchorage). The program focus includes clinical, community and cross-cultural psychology with an emphasis on indigenous, Alaska Native and American Indian psychology. As a UAF-UAA partnership, the program integrates the strengths and resources of both campuses to advance academic excellence, promote innovative and practical research, and provide solid graduate training in clinical-community psychology.

The program ensures that graduates have obtained the full range of clinical training mandated for doctoral-level clinical psychologists and will be adequately prepared for licensure as psychologists.

Students apply to the joint Ph.D. program in Clinical-Community Psychology at both UAF and UAA. **All applicants must submit identical application materials to both institutions;** materials are collected and evaluated by the joint UAF/UAA Ph.D. admissions committee which makes admissions recommendations to the dean of the UAF graduate school. Applicants may specify a preference for either campus as a location for their studies. For more information about the application process, visit the program website.

Graduate Program — Ph.D. Degree Admission Requirements

1. Application deadline: Received by Feb. 1 for the following fall admission. This is the only opportunity for program admission each year.
2. Compliance with the university requirements for a doctoral degree and admission to graduate studies as detailed in the UAF catalog.
3. Minimum of a bachelor's degree (B.S. or B.A. or B.Ed.); major in psychology or related field preferred. All requirements for bachelor's degree must be completed by June 30 prior to matriculation.
4. Minimum undergraduate grade point average of 3.0.
5. Minimum 3.0 grade point average in major and in all psychology courses.
6. Course work in the areas of abnormal psychology, statistics, research methods and one of the following: personality, clinical psychology, social psychology or community psychology. All prerequisite course work must be completed by June 30 prior to matriculation.
7. Letter of intent describing the applicant's interest and purpose in studying clinical-community psychology, the reasons why a Ph.D. in clinical-community psychology at UAF/UAA is sought at this point in the applicant's professional development, and demonstrating an understanding of relevant professional ethics.

8. Professional vita, including documentation regarding academic, research and professional experiences, special projects and activities, and recognitions or honors.
9. Three professional references (preferably curriculum or research advisors, major course instructors with whom the student had contact in more than one course, and/or supervisors). Each reference must have been contacted to provide a signed and completed reference rating form and letter of support. Reference rating forms are located at <http://psyphd.alaska.edu/admissions.htm>.
10. A disclosure statement must accompany the application to the program. Lifetime criminal background check must be submitted by students invited to a personal interview at least two weeks prior to the interview. Additional information on the disclosure statement and FBI criminal background check is located at <http://psyphd.alaska.edu/admissions.htm>.
11. Students admitted to the Ph.D. program have the option to obtain the UAA M.S. degree in clinical psychology.

Graduation Requirements

1. Complete the general university requirements (page 202).
2. Complete the program and additional requirements listed below:

Program Requirements

Students must complete 26 required courses (for a total of 70 credits), 18 credits of dissertation, 18 credits of predoctoral internship and 9 credits of electives. Students must accumulate a minimum of 115 credits to graduate and must have completed all required course work. Students entering the program with a masters degree in psychology or related field must complete at least two years of full-time course work, 18 credits of dissertation, and one year of predoctoral internship, all approved by the student's advisory committee.

Students admitted to the PhD program have the option to obtain the UAA M.S. degree in clinical psychology.

1. Cultural experience: During their first year in the Ph.D. program, students must participate in a cultural experience as defined by program faculty. The actual experience varies from year to year, but includes direct exposure to Alaska Native and other cultural world views, values and life experiences through contact with cultural elders and advisors. The goal of the cultural experience is to provide an opportunity to interact directly with cultures in a non-classroom setting.
2. Complete the following required courses:

PSY F602—Native Ways of Knowing	3
PSY F603—Alaska and Rural Psychology	3
PSY F604—Biological and Pharmacological Bases of Behavior	3
PSY F605—History and Systems	1
PSY F607—Cognition, Affect and Culture	3
PSY F611—Ethics and Professional Practice	3
PSY F612—Human Development in a Cultural Context	3
PSY F616—Program Evaluation and Community Consultation I	3
PSY F617—Program Evaluation and Community Consultation II	3
PSY F622—Multicultural Psychopathology	3
PSY F623—Intervention I	3
PSY F629—Intervention II	3
PSY F632—Community Psychology Across Culture	3
PSY F633—Tests and Measurement in Multicultural Context	3
PSY F639—Research Methods	3
PSY F652—Practicum Placement — Clinical I	3
PSY F653—Practicum Placement — Clinical II	3
PSY F657—Quantitative Analysis	3
PSY F658—Qualitative Analysis	3
PSY F672—Practicum Placement — Community I	3
PSY F679—Multicultural Psychological Assessment I	3

PSY F681—Substances of Abuse in Alaska.....	1
PSY F682—Substance Abuse Assessment and Treatment Planning.....	1
PSY F683—Clinical Interventions in Substance Abuse.....	1
PSY F686—Predoctoral Internship	18
PSY F699D—Dissertation	18
Electives	9
3. Minimum credits required:	115

Additional Requirements

1. *Clinical Competency*: Clinical competency is demonstrated through preparation of a clinical portfolio that will be evaluated by an ad hoc committee. Criteria for the portfolio will be clearly defined and samples will be provided for students. Students must demonstrate clinical competency before applying to advance to the predoctoral internship and must pass both the clinical competency and community competency before starting the predoctoral internship.
2. *Research Competency*: Research competency is demonstrated through preparation of a research portfolio that will be evaluated by an ad hoc committee. Criteria for the portfolio will be clearly defined and samples will be provided for students.
3. *Advancement to Candidacy*: Before students are allowed to register for dissertation credits, they will be reviewed for performance by the joint UAF/UAA Ph.D. committee, using existing university standards and forms for advancement to candidacy. Review will be based on faculty experience with students to date, submitted paperwork and student's progress through the program. Feedback from the review will be provided to the student by her or his advisor. The program defines the comprehensive exam as being met through passing the required competency portfolios. All portfolios must be passed for the comprehensive exam to be fully passed. Passing one portfolio qualifies the student for a conditional pass on the comprehensive exam, which is sufficient for the advancement to candidacy.
4. *Doctoral Dissertation Proposal Defense*: Before commencing data collection for a dissertation project, students must defend their proposal to their dissertation committee. The defense must be based on a written dissertation proposal to be distributed to the dissertation committee after approval by the dissertation chair. The defense will be an oral presentation to the committee by the student and will not be a public meeting. For data-collection-based dissertations, the proposal must also be approved by the UAF or UAA Institutional Review Board before data collection can commence.
5. *Doctoral Dissertation*: A doctoral dissertation must be carried out successfully and approved by a doctoral dissertation committee. The dissertation committee will consist of at least four members. It is recommended that the dissertation chair be on the same campus as the student. There must be at least one committee member from each psychology department at UAF and UAA. Content areas can vary widely, but must be related to clinical, community, or cross-cultural issues and applicable in Alaska settings.
6. *Advancement to Internship*: Students must apply to the local program director by Sept. 30 (the fall semester prior to the year during which the student seeks to complete the internship) stating their intent to advance to internship. For most students this will mean that the application needs to be made in the fall of the third year in the program. The program director will notify the core faculty committee, who will review the students' course work, assure that adequate progress has been made toward all prior milestones (i.e., clinical competency, doctoral dissertation outline [the outline must be completed, submitted and approved by the chair] and advancement to candidacy) before approving the student for internship and before writing a letter of support for the student.

Students must fully pass the clinical portfolio before starting the internship. Failure to pass the clinical portfolio will result in the student not being eligible to enroll in internship credits.

7. *Predoctoral Internship*: A full-time, one-year predoctoral internship is required. This internship should meet the criteria laid out by the American Psychological Association; selection of an Association of Psychology Postdoctoral and Internship Centers-approved internship is encouraged. Placements in Alaska are preferred, but not required.
8. *APA Ethical Guidelines*: Strict compliance with APA ethical guidelines is required throughout participation in the degree program. Violations can result in immediate dismissal from the program and failure to graduate. Completion of an annual disclosure statement is also required. Affirmative answers may result in dismissal from the program and failure to graduate. The disclosure statement may be viewed at <http://psyphd.alaska.edu>.

RURAL DEVELOPMENT

College of Rural and Community Development
Department of Alaska Native Studies and Rural Development
Fairbanks Campus 907-474-6528/888-574-6528 toll-free
Anchorage office 907-279-2700/800-770-9531 toll-free
Bristol Bay Campus 907-842-8316
Chukchi Campus 907-442-3400
Interior-Aleutians Campus 907-474-5439
Kuskokwim Campus 907-543-4500
Northwest Campus 907-443-2201
www.uaf.edu/danrd/ma-program/

M.A. Degree

Minimum Requirements for Degree: 30 credits

The Department of Alaska Native Studies and Rural Development M.A. program is designed to educate leaders who understand the dynamic relationship of rural Alaska with the global economy and who have professional skills in areas of leadership, business development, administration and conflict management. Graduates typically take positions with tribal and municipal governments, fisheries, tourism, Native corporations, regional health corporations or non-profits, state/federal agencies, or other private businesses.

Graduate degree students gain a broader theoretical understanding of development processes in Alaska and the circumpolar North. Graduate students complete a thesis or applied community development project, and have opportunities for international study and research.

Students can earn the M.A. degree either on the Fairbanks campus or through distance delivery. Special application requirements and deadlines apply for distance M.A. degree programs. For more information contact the department toll-free 800-770-9531 or visit www.uaf.edu/danrd/ma-program/.

Graduate Program — M.A. Degree

1. Complete the general university requirements (page 202).
2. Complete the master's degree requirements (page 206).
3. Complete the following core courses:
RD F600—Circumpolar Indigenous Leadership Symposium 3
RD F601—Political Economy of the Circumpolar North 3
RD F625—Community Development Strategies:
Principles and Practices 3
RD F650—Community-Based Research Methods 3
RD F651—Management Strategies for Rural Development 3

4. Complete 9 – 12 elective credits at the F600-level (up to 6 credits may be at the F400-level with approval from the graduate committee):
 - RD F425—Cultural Impact Analysis 3
 - RD F652—Indigenous Organization Management 3
 - RD F655—Circumpolar Health Issues 3
 - ANTH F610—Northern Indigenous Peoples and Contemporary Issues..... 3
 - CCS F608—Indigenous Knowledge Systems 3
5. Complete one of the following:
 - Research Project 6
 - Thesis 6 – 9
6. Minimum credits required 30

SCIENCE MANAGEMENT

College of Engineering and Mines
 Department of Civil and Environmental Engineering
 907-474-7694
www.uaf.edu/esm/

M.S. Degree

Minimum Requirements for Degree: 30 credits

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

Graduate Program — M.S. Degree

1. Complete the following admission requirements:
 - a. Complete a bachelor's degree in a scientific field.
 - b. On-the-job professional experience is recommended.
2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206).
4. Present project reports which provide comprehensive analysis and propose solutions to a situation in an engineering or scientific management setting. Pass an oral comprehensive examination.
5. Complete courses from the four main engineering management subject areas as follows:
 - a. Human Element (two courses required)
 - ESM F601—Managing and Leading Engineering Organizations 3
 - BA F607—Human Resources Management 3
 - b. Project Management (two courses required)
 - ESM F609—Project Management (3)
 - ESM F608—Legal Principles for Engineering Management (3)
 - CE F620—Civil Engineering Construction (3)..... 6
 - c. Quantitative Methods (one course required)
 - ESM F622—Engineering Decisions (3)
 - or ESM F620—Statistics for ESM (3)
 - or ESM F621—Operations Research (3) 3
 - d. Financial (two courses required)
 - ACCT F602—Accounting for Managers 3
 - ESM F605—Engineering Economic Analysis* 3
6. Complete the following:
 - ESM F684—Engineering/Science Management Project 3

7. Minimum credits required 30
- Note: Balance of credits may be managerial or technical electives as approved by the student's graduate advisory committee.*
- * May be waived with prior undergraduate engineering economics course.
- See Arctic Engineering.
 See Engineering for Ph.D. program.
 See Engineering Management.
 See Environmental Engineering and Environmental Quality Science.

SOFTWARE ENGINEERING

College of Engineering and Mines
 Department of Computer Science
 907-474-2777
www.dms.uaf.edu

M.S.E. Degree

Minimum Requirements for Degree: 30 credits

Software engineering is defined as “the application of a systematic, disciplined, quantifiable approach to the development, operation and maintenance of software” (IEEE Standard Glossary of Software Engineering Terminology).

Graduates of the UAF M.S.E. program will be prepared to develop high-quality software products which meet required deadlines within budget constraints, understand complex software-intensive systems and to participate in their development and application while adopting different process roles. Those roles include software architecture, design, construction, test and project management.

Local, national and international employment opportunities for software engineers continue to be numerous.

Graduate Program — M.S.E. Degree

1. Complete the UAF admission process including the following:
 - a. Submit GRE general scores.
 - b. Complete at least a bachelor's degree at an accredited institution with a GPA of at least 3.0. Complete course work or possess practical knowledge at the advanced undergraduate level in each of the following areas: computer organization, discrete mathematics, algorithms and data structures, object-oriented programming (e.g., C++, FORTRAN95, or Java), and an in-depth knowledge of at least two of the following topics; compiler techniques, comparative programming languages, operating systems or database systems.
 - c. Have at least two years of relevant software development experience or equivalent.
 2. Complete the general university requirements (page 202).
 3. Complete the master's degree requirements (page 206).
 4. Complete the following:
 - CS F602—Software Project Management 3
 - SWE F671—Advanced Software Engineering 3
 - SWE F673—Software Requirements Engineering 3
 - SWE F674—Software Architecture 3
 - SWE F690—Graduate Seminar and Project 3
 - SWE F691—Graduate Seminar and Project 3
 - Approved electives 12
 5. Minimum credits required 30
- Note: Each student must take and pass a comprehensive examination covering material from all of the required courses listed in item four above. CS F670/SWE F670—Computer Science for Software Engineers is required as a deficiency course for students without B.S. in computer science.*
- See Computer Science.

STATISTICS

College of Natural Science and Mathematics
Department of Mathematics and Statistics
907-474-7332
www.dms.uaf.edu

Graduate Certificate, M.S. Degree

Minimum Requirements for Certificate: 12 credits; M.S.: 30 credits

Statistics is a collection of methods and theories used to make decisions or estimate unknown quantities from incomplete information. Statistical techniques are useful, for example, in estimating plant, animal and mineral abundances; forecasting social, political and economic trends; planning field plot experiments in agriculture; performing clinical trials in medical research; and maintaining quality control in industry. Employment opportunities are excellent for statisticians in many of these areas.

As a post-baccalaureate program, the certificate in statistics is equivalent to a full year of graduate statistics courses and is ideal for current graduate students in disciplines other than statistics (especially the sciences). The graduate certificate in statistics encourages a more in-depth study of statistics and provides students a credential recognizing their quantitative expertise.

The M.S. degree program in statistics builds upon UAF's strength in the sciences and our setting in Alaska by introducing a strong quantitative alternative or supplement to existing programs. The curriculum is built around four statistics core courses and flexibility in selection of elective courses. The core courses are designed to blend mathematical statistics course work typical of most M.S. programs in statistics with real applications. We believe this blending provides a substantial improvement in the graduate's skills.

Graduates of this program could be labeled quantitative biologists, biometricians, quantitative geologists, geostatisticians, or mathematical statisticians depending upon their specific course work. In addition, this program prepares individuals for Ph.D. level work in statistics or their area of application.

The statistics program is administered by the Department of Mathematics and Statistics.

Graduate Program — Graduate Certificate

- Complete the following admission requirements:
 - Hold a baccalaureate degree from an accredited institution
 - Complete MATH F200X, MATH F201X and MATH 202X or equivalent*
 - Complete STAT F401 or equivalent*
- Complete the general university requirements (page 202).
- Complete the graduate certificate requirements (page 206).
- Complete the following:

STAT F651—Statistical Theory I.....	3
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- Complete one of the following options:
 - Complete one of the following:

STAT F652—Statistical Theory II (4)	
or STAT F653—Statistical Theory III (3).....	3 – 4
 - Complete two of the following:

STAT F602—Experimental Design.....	3
STAT F605—Spatial Statistics	3
STAT F611—Time Series	3
STAT F621—Distribution-Free Statistics	3
STAT F631—Categorical Data Analysis.....	3

- Complete one of the following electives to total 12 credits for the certificate

STAT F641—Bayesian Statistics.....	3
PHYS F628—Digital Time Series Analysis.....	3
WLF/FISH F625—Analysis of Vertebrate Populations	
Survival and Movement.....	3
FISH F601—Quantitative Fishery Science	3
ECON F626—Econometrics	3
ECON F627—Advanced Econometrics.....	3
ESM F621—Operations Research.....	3
MATH F641—Real Analysis.....	4
MIN/GE F635—Geostatistical Ore Reserve Estimation	3

- Minimum credits required..... 12

* Student must earn a C grade or better in each course.

Graduate Program — M.S. Degree

- Complete the following admission requirements:
 - Submit three letters of recommendation concerning the applicant's educational background and quantitative training.
 - Submit complete transcripts for all college-level work.
 - Submit a resume.
 - Submit a written statement of goals.
 - Submit GRE scores.
 - The applicant must have completed a bachelor's degree from an accredited institution with a GPA of at least 3.0.
 - Must have completed the following courses or their equivalent with a B grade or better: full calculus sequence (MATH F200X, F201, F202); or students completing MATH F262X or F272 must take MATH F201X and F202X before acceptance; and a course in linear algebra (MATH F314), at least one introductory statistics or probability course (STAT F200X, F300 or MATH F371, F408). Students lacking MATH F314 may be accepted on probation.
- Complete the general university requirements (page 202).
- Complete the master's degree requirements (page 206).
- Complete the following statistics (core) courses:

STAT F651—Statistical Theory I.....	3
STAT F652—Statistical Theory II	4
STAT F653—Statistical Theory III—Linear Models	3
STAT F654—Statistical Consulting Seminar	1
STAT F698—Project.....	3
- Complete two of the following courses:

STAT F461—Applied Multivariate Statistics	3
STAT F602—Experimental Design.....	3
STAT F605—Spatial Statistics	3
STAT F621—Distribution Free Statistics.....	3
STAT F631—Categorical Data analysis	3
STAT F641—Bayesian Statistics.....	3
STAT F661—Sampling Theory.....	3
STAT F611—Time Series	3
- Complete at least 6 credits of approved courses from an application area or courses with substantial statistical and/or mathematical content.*

- Minimum credits required..... 30
- * Students working in subject areas involving significant non-English literature will be expected to read the appropriate foreign language.

Note: Each student must take and pass a two-part comprehensive exam. The first part, written by the statistics faculty, is a written exam (not a take-home exam) covering the material in the core statistics courses. The second part is an oral exam covering follow-up questions from the written exam as well as any material from courses the student has taken along with their project.

WILDLIFE BIOLOGY AND CONSERVATION

College of Natural Science and Mathematics
Department of Biology and Wildlife
907-474-7671
www.bw.uaf.edu

M.S. Degree

Minimum Requirements for Degree: 30 credits

The geographic location of the university is particularly advantageous for the study of wildlife biology. 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 arctic tundra.

Adequate study collections of plants and animals are available, and a 2,000-acre study area is near the campus. Wildlife biology students have ample opportunity for close association with the personnel of the Alaska Cooperative Fish and Wildlife Research Unit, Institute of Arctic Biology and several local offices of federal and state conservation agencies. These agencies often provide support for graduate student projects, and program faculty usually hire a number of students for summer field work. Exceptional opportunities are available for students to gain experience and make job connections.

The Department of Biology and Wildlife, the Institute of Arctic Biology, and the Alaska Cooperative Fish and Wildlife Research Unit cooperate in offering graduate work leading to the M.S. degree. Detailed information on the graduate program in wildlife biology and management is available from the chair of the wildlife program.

The Alaska Cooperative Fish and Wildlife Research Unit and Institute of Arctic Biology offer a limited number of research assistantships. Teaching assistantships are available in the Department of Biology and Wildlife.

Graduate Program — M.S. Degree

1. Complete the following admission requirement:
 - a. Submit scores from both the GRE general test (required) and the GRE subject test in biology (highly recommended).
 - b. If English is not your native language, submit scores from both the Test of Spoken English and the Test of Written English, as well as TOEFL scores. Requests, including justification, for exceptions to this requirement should be made to the chair of the department.
2. Complete the general university requirements (page 202).
3. Complete the M.S. — with Thesis degree requirements (page 208).
4. As part of the M.S. degree requirements, complete and pass the departmental written and oral master's comprehensive examination.
5. Minimum credits required 30
See Biological Sciences.