

# Master of Science in Biological Sciences

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The graduate program in biological sciences offers a research program of study leading to a Master of Science (MS). The MS program has both a thesis and non-thesis option. The thesis option requires completion of a written thesis and public and private thesis defense resulting from research performed under the supervision of a UAA faculty member. The non-thesis option requires completion of a capstone project under the supervision of a UAA faculty member and that the student pass a comprehensive written exam.

We recommend that prospective students review the program guidelines and expectations, which are detailed on the UAA Department of Biological Sciences webpage (<https://www.uaa.alaska.edu/academics/college-of-arts-and-sciences/departments/biological-sciences/>). General guidelines for prospective students can also be found on the UAA Graduate School webpage (<http://www.uaa.alaska.edu/graduateschool/prospective/>).

## Admission Requirements

- Complete the Admission Requirements for Graduate Degrees (<https://catalog.uaa.alaska.edu/academicpoliciesprocesses/admissions/graduate/>).
  - Students seeking admission into the Master of Science (MS) in Biological Sciences should also meet the following requirements. Details on this process are available on the department's website (<http://www.uaa.alaska.edu/biological-sciences/>).
1. Students must have a bachelor's degree in biology, chemistry or equivalent science as determined by the Graduate Affairs Committee.
  2. Applicants must have at least a 3.00 GPA. Successful applicants ordinarily have no grade lower than a C in undergraduate science courses.
  3. Submit the following documents:
    - a. A brief (typically one page) statement of the applicant's research and career goals.
    - b. Three letters of recommendation from persons who are qualified to evaluate the applicant's ability to successfully perform graduate-level coursework and research should be submitted directly to the department. One of the letters can be from the applicant's prospective faculty mentor.
    - c. For students applying for the thesis option, a letter of support from a UAA faculty member from the Department of Biological Sciences expressing willingness to accept the applicant into their research group and a statement of available funding or funding opportunities for research support for the student.
    - d. For students applying for the non-thesis option, a letter of support from someone willing to serve as the student's graduate advisor who fulfills the requirements detailed in point 1 of Additional Requirements for Non-thesis-based MS in Biological Sciences and Project Based

Interdisciplinary MS Students Homed in Biological Sciences below.

- e. Because students will not be admitted to the program without a Department of Biological Sciences faculty willing to serve as their graduate advisor or co-advisor, prospective graduate students are strongly advised to contact faculty prior to application to the graduate program to arrange advisor support and mentorship. Faculty research interests are available on the department website (<http://www.uaa.alaska.edu/biological-sciences/faculty-and-staff/tenuretrackfaculty.cfm>).

All documents should be submitted through the UAA Office of Admissions Application Portal. Questions about this process should be directed to the departmental graduate affairs administrative assistant at (907) 786-4770.

Mailing address:

*Department of Biological Sciences Graduate Program  
3101 Science Circle, CPSB 101N  
Anchorage, AK 99508*

All materials are due by **March 1** for fall admission and by **November 1** for spring admission. Acceptance is determined by the Biological Sciences Graduate Affairs Committee and is based on the prospective student's overall credentials and the availability of appropriate faculty for student research interests. Files received after these deadlines will be considered on a case-by-case basis for admission beginning the subsequent semester.

## Thesis Option Graduation Requirements

- Complete the General University Requirements for Graduate Degrees (<http://catalog.uaa.alaska.edu/graduateprograms/degreerequirements/>).
- Complete 30 credits of coursework approved in advance by the student's graduate study committee (GSC).
- Satisfactorily complete thesis research as detailed in a written thesis proposal and approved in advance by the student's graduate study committee.
- Submit a written graduate thesis that has been approved by the graduate study committee, departmental director, and deans of the College of Arts and Sciences and the Graduate School.
- Pass an oral thesis defense.
- Complete the following major requirements:

Code	Title	Credits
BIOL A601	Experimental Design and Statistics	3
BIOL A605	Graduate Proseminar in Sciences	3
BIOL A606	Advanced Analysis and Interpretation *	3
BIOL A698	Directed Research **	9
BIOL A699	Thesis **	3

600-level science electives (does not include BIOL A698, BIOL A698A or BIOL A699 credits)	9
<b>Total</b>	<b>30</b>

- \* *This requirement can be substituted with 3 600-level science elective credits (but not including BIOL A698, BIOL A698A or BIOL A699 credits) with the approval of student's graduate study committee if the student has sufficient other experience or coursework in statistical analysis.*
- \*\* *While additional credits can be taken, a maximum of 9 credits for BIOL A698 and 3 credits for BIOL A699 will apply towards the 30 credits required for the degree.*

In order to graduate, students must receive a minimum grade of B in all 400-level courses and a minimum grade of C in all 600-level courses, provided that the cumulative GPA does not drop below 3.00.

**A minimum of 30 credits is required for the degree.**

### **Additional Requirements for Thesis-based MS in Biological Sciences and Thesis-based Interdisciplinary MS Students Homed in Biological Sciences**

1. Within the first semester of study, each student must select a graduate study committee consisting of a minimum of three members (no more than five is recommended). Two of the three members must be full-time, tenure-track faculty in the Department of Biological Sciences. The committee chair will be the student's primary research advisor if that person is a full-time UAA faculty member. If the primary research advisor is an affiliate faculty member, the chair will be shared with a full-time UAA faculty member from the Department of Biological Sciences, and both will be designated as co-chairs. To be a co-chair, a non-UAA faculty member must have official affiliate status within the department.
2. A student's graduate study committee must meet at least once each year to review a student's progress. The annual report on student progress (available online from the Graduate School) must be completed by the student and committee, signed by the graduate study committee, filed with the graduate affairs administrative assistant, and submitted to the UAA Graduate School no later than **May 15** for students who started the program in the summer or fall semesters or **December 15** for students who started the program in the spring semester. Failure to file annual progress reports will be taken as an indication of inadequate progress, and is grounds for probation and subsequent dismissal from the program.
3. Each student must submit a graduate studies plan (GSP) by the end of the first semester of graduate work. The GSP formally establishes the specific program requirements that will, upon satisfactory completion, entitle the student to receive the graduate degree or certificate. This GSP must be approved by the student's graduate study committee and also by the department director and the dean of the Graduate School.
4. All graduate students must remain in good standing throughout their program. At a minimum, students not in good standing will not be able to compete for teaching assistantships or be awarded tuition waivers from the department, college or Graduate School.

Students not in good standing risk being placed on probation and/or removed from the program. In order to remain in good standing in the program, students must:

- a. maintain a 3.00 GPA (cumulative) in all coursework listed on their GSP,
  - b. file a GSP by the end of their first semester in residence and
  - c. file satisfactory progress reports during each year in residence.
5. Within their first year in the program, each graduate student is required to submit a written thesis proposal that details the plan for the student's graduate work. This document is developed in consultation with the graduate advisor, and once prepared must be submitted and approved by the student's graduate study committee. A copy of the approved proposal shall be placed in the student's departmental file.
  6. Students will conduct the research outlined in the thesis proposal and present their results as a graduate thesis following guidelines provided by the Graduate School. This written thesis must be approved by the graduate study committee, the director of the Department of Biological Sciences, the dean of the College of Arts and Sciences, and the dean of the Graduate School in order to be considered complete. No student shall graduate without completing a written thesis.
  7. Following submission of their thesis to their GSC, students must present a thesis defense seminar, which will be followed by a private meeting with their graduate study committee to finalize the defense. The student must successfully defend the thesis in order to graduate.

### **Thesis-based MS Option Expectations**

Students who undertake a thesis-based MS degree should be able to demonstrate that they can:

- Develop a testable hypothesis and explore research questions;
- Locate, retrieve and utilize appropriate information;
- Read, understand, and critically review the primary literature;
- Utilize appropriate methodology to conduct a research-based study;
- Analyze results using qualitative or quantitative techniques;
- Compare their results to previous studies;
- Explain the contribution of their study to the broader field of existing knowledge;
- Communicate the importance of their work in an oral presentation (as a public and private thesis defense); and
- Communicate the importance of their work in written format (as a thesis).

### **Non-thesis Option Graduation Requirements**

- Complete the General University Requirements for Graduate Degrees (<http://catalog.uaa.alaska.edu/graduateprograms/degreerequirements/>).
- Complete 30 credits of coursework approved in the student's graduate study plan, as detailed below.
- Complete the Additional Requirements, as detailed below.

Code	Title	Credits
BIOL A601	Experimental Design and Statistics	3
BIOL A605	Graduate Proseminar in Sciences	3
BIOL A698A	Non-thesis Capstone Project *	6
600-level science electives (does not include BIOL A698, BIOL A698A or BIOL A699 credits)		15
ENGL A414	Research Writing **	3
<b>Total</b>		<b>30</b>

\* While additional credits can be taken, a maximum of 6 credits for BIOL A698A will apply towards the 30 credits required for the degree.

\*\* or equivalent, as approved by the student's graduate advisor.

In order to graduate, students must receive a minimum grade of B in all 400-level courses and a minimum grade of C in all 600-level courses, provided that the cumulative GPA does not drop below 3.00.

**A minimum of 30 credits is required for the degree.**

### Additional Requirements for Non-thesis-based MS in Biological Sciences and Project Based Interdisciplinary MS Students Homed in Biological Sciences

1. Within the first semester of study, each student must select a graduate advisor who is either a UAA faculty member or an individual eligible to be a UAA affiliate faculty member. If the primary advisor's main appointment is from outside the Department of Biological Sciences, there must be a co-advisor who is a full-time Department of Biological Sciences faculty member, and both will be designated as co-advisors.
2. An annual report on student progress (available online from the Graduate School) must be completed by the student and advisor(s), filed with the graduate affairs administrative assistant, and submitted to the UAA Graduate School no later than **May 15** for students who started the program in the summer or fall semesters or **December 15** for students who started the program in the spring semester. Failure to file annual progress reports will be taken as an indication of inadequate progress, and is grounds for probation and subsequent dismissal from the program.
3. Each student must submit a graduate studies plan (GSP) by the end of the first semester of graduate work. The GSP formally establishes the specific program requirements that will, upon satisfactory completion, entitle the student to receive the graduate degree or certificate. The GSP must be approved by the student's graduate advisor and also by the department director and the dean of the Graduate School.
4. All graduate students must remain in good standing throughout their program. At a minimum, students not in good standing will not be able to compete for teaching assistantships or be awarded tuition waivers from the department, college or Graduate School. Students not in good standing risk being placed on probation and/or removed from the program. In order to remain in good standing in the program, students must:

- a. maintain a 3.00 GPA (cumulative) in all coursework listed on their GSP,
  - b. file a GSP by the end of their first semester in residence and
  - c. file satisfactory progress reports during each year in residence.
5. Within their first year in the program, each graduate student is required to submit a written capstone project proposal that details the plan for the student's graduate work. This document is developed in consultation with the graduate advisor. A copy of the approved proposal shall be placed in the student's departmental file.
  6. Students will conduct the work outlined in the capstone project proposal and present their results in written format (in quality similar to a manuscript suitable for publication). No student shall graduate without completing a written capstone project.
  7. Students must orally present the results of their capstone project in a context available to the department and university community.
  8. Students must pass a written comprehensive exam.

### Non-thesis-based MS Option Expectations

Students who undertake a thesis-based MS degree should be able to demonstrate that they can:

- Develop a plan for a project or develop a plan for a scholarly or creative work;
- Locate, retrieve and utilize appropriate information;
- Read, understand, and critically review the primary literature or previous creative works;
- Utilize appropriate methodologies to conduct an applied study, implement a project, or utilize appropriate skills to produce a creative work;
- Analyze results using qualitative or quantitative techniques when appropriate;
- Compare their results to previous studies when appropriate;
- Communicate the originality and contribution of their capstone project to the broader field, as well as their mastery of topical knowledge of biological sciences in an oral presentation (in a context available to the department and university community);
- Communicate the originality and contribution of their capstone project to the broader field, as well as their mastery of topical knowledge of biological sciences in written format (in quality similar to a manuscript suitable for publication); and
- Demonstrate understanding of foundational knowledge of the biological sciences by passing a written comprehensive exam.

### Program Student Learning Outcomes

Students graduating with a Master of Science in Biological Sciences:

- Have mastered the fundamental concepts of biology, including cell and molecular biology, genetics, physiology, evolution and ecology.
- Will have a working knowledge of the principles of scientific methodology, of the methods and technology of biological research, of quantitative analysis of scientific data, and will be capable of writing a publishable scientific paper.
- Will have a demonstrated mastery of at least one focus area within biology or biochemistry.

- Are prepared for a career in biological sciences or are prepared to pursue more advanced research opportunities (e.g., PhD or postdoctoral programs).