Research Capstone in Biological Sciences
BIOL F400
Fall 2024, 0 credits, CRN 72216

Course Coordinator

Diane Wagner
Professor and Department Chair, Biology and Wildlife
dwagner10@alaska.edu (email is the fastest form of contact)
101D Murie Building
907-474-5227
Office hours by appointment

Catalog Course Description

Enrollment in BIOL F400 signals that a student has initiated a capstone research project. The capstone project may be completed within a designated course or by working individually with a faculty mentor; see the biological sciences program description for more information.

Prerequisites

Junior or senior standing
Note that students should have a plan in place to initiate a research project before registering for BIOL F400

Online Platform

Information and assignments for BIOL F400 students will be posted on Canvas (https://canvas.alaska.edu/).

This Is Not a Normal Course!

The capstone experience for students in the Biological Sciences major is to complete a mentored research project. The project is carried out in a designated course or by working individually with a faculty mentor. The BIOL F400 "course" does not add to the project work involved; rather it is an administrative tool to keep track of students working on their capstone research in many different ways. BIOL F400 confers no credit and has no regular course meetings. However, you will be asked to complete a survey and a plagiarism quiz, receive occasional communications from the coordinator, and you are expected to keep the coordinator informed about your progress.

Once you have completed the research project requirements and the faculty mentor confirms this is the case, the BIOL 400 coordinator will report a passing grade on BIOL F400 to the registrar.

Goals and Learning Objectives
The broad goal of the capstone project is to integrate knowledge and skills learned in previous courses, including scientific knowledge, quantitative literacy, and communication skills, and to apply these products of the university education to a creative activity. For a biologist, a fundamental expression of applied knowledge, creativity, and critical reasoning is to engage in scientific inquiry.

The learning objectives of the capstone project are as follows:

- Learn through experience to pose and test biological hypotheses.
- Employ critical thinking by evaluating the scientific literature in the subject area.
- Reinforce and enhance quantitative knowledge by analyzing and interpreting data.
- Reinforce and enhance writing and oral presentation skills by communicating science.

Who is Required To Do a Research Capstone Project?
The research capstone project is required of all students pursuing a B.S. degree in Biological Sciences. (Students pursuing a B.A. in Biological Sciences are expected to complete their capstone project by taking Integrative Capstone in Biological Sciences (BIOL F410), which requires an interdisciplinary project instead of a scientific research project.)

Requirements of a Research Capstone Project
The Research Capstone in Biological Sciences consists of a mentored research project on a biological topic that is completed in the junior or senior year. The requirements are:

- The capstone project must be chosen by the student in consultation with a faculty mentor.
- The faculty mentor must approve the project before work begins.
- The project must include the evaluation of data. In most cases the student will collect an original data set, but working with an existing data set is also acceptable.
- The rationale, approach, and conclusions must be communicated in three ways.
    1. A formal written report in the style of a scientific paper
    2. A short, non-technical summary of the project goals and outcomes, written for the public
    3. An oral presentation of the study goals and outcomes

All capstone projects are assessed using a common set of expectations (see Final Evaluation of Capstone Project).

How to Pursue a Capstone Research Project
Students may pursue a capstone project in one of two ways.

1. Take a designated research capstone course
A student may perform a project within a designated capstone course in Biological Sciences or Wildlife Biology and Conservation. Courses designated as capstone research courses are offered across a range of sub-disciplines within biology. A list of capstone courses in Biological Sciences may be found in the UAF catalog (see the B.S. program description) and new ones crop up from time to time as trial courses (BIOL F494) or special topics courses (BIOL F493). All capstone

courses include the expectation that the student will complete a biological research project. Typically, the capstone course instructor will introduce one or several model study systems and methodologies that will form the basis for the student's project. The course instructor will assist the student to design a study and analyze the results. The capstone requirement within a course will be fulfilled only when all criteria of the capstone project are evaluated as adequate or better on the Final Evaluation of Capstone Projects rubric. It is expected that the capstone project will constitute only a portion of the course grade. **Thus, it is possible for a student to pass a capstone course without receiving credit for the capstone project, or to receive credit for the capstone project without passing the course.** When the student has successfully completed the project, the course instructor will provide the BIOL F400 course coordinator with a signed evaluation form and copies of the written assignments (the formal paper and the non-technical summary). The BIOL F400 instructor will report the outcome of the capstone to the UAF Registrar, and archive the project materials.

2. Work individually with a faculty mentor

A student may satisfy the capstone requirement by conducting a research project individually with a faculty mentor, typically a member of the UAF Biology & Wildlife faculty. **A student wishing to work individually with a mentor must submit a Capstone Research Mentoring Agreement form to the BIOL 400 coordinator (dwagner10@alaska.edu) by end of day Fri 13 Sep.** The form is available on the BIOL 400 Canvas site (https://canvas.alaska.edu/) and the Biology & Wildlife website (https://www.bw.uaf.edu, choose: undergraduates/capstone experience/research capstone in biological sciences/forms.

If the research mentor is not a member of the Biology & Wildlife faculty, then an additional faculty evaluation of the final project must be completed by a faculty member in the Biology & Wildlife Department. If an additional faculty evaluator is necessary, the student should work with the mentor to identify an appropriate evaluator, and the evaluator should agree to serve in that capacity, early in the process and before work begins.

Please note that projects completed working individually with a faculty member often take longer to complete than those completed in a class. You should not start an individual project for capstone credit in your last semester before graduation.

When the individual project is complete and has been evaluated as satisfactory or better in all regards, the student should send the following documents electronically to the BIOL F400 instructor (dwagner10@alaska.edu) or the Biology and Wildlife Office Manager (uaf-bw-dept@alaska.edu):

- Written report (clean version in its final form)
- Non-technical summary (clean version in its final form)
- Final Evaluation of the Capstone Project form, signed by the research mentor
- If relevant (see paragraph above): an additional Final Evaluation of the Capstone Project form, signed by a Biology & Wildlife Department faculty evaluator

A student may receive course credit for the mentored research project by enrolling in individual study (e.g. BIOL F497), and these credits may be applied to the student's degree requirements; however, course credits are not necessary for completion of the capstone project.

What If I Do Not Complete the Project Within a Semester?
A capstone research project might extend across several semesters, or an initial project may be abandoned in favor of a new one. In these cases, **there is no need to register for BIOL F400 repeatedly**. If the capstone project is not completed, or not completed satisfactorily, within a semester, the BIOL F400 grade will be deferred (DF) grade until a later semester. The DF will be changed to P when the student passes the capstone project. A DF grade will convert to a W after two years. The BIOL F400 coordinator can prevent this conversion if the student demonstrates she or he is actively working to complete a project.

The Research Capstone Assignments in More Detail

Written report
All capstone projects must include a written report. This is typically a final paper expressing the study goals, methods, findings, and conclusions written in the style of a scientific paper, but in special cases it be a research proposal. The report should meet the following guidelines:

- Final research reports should include the following sections: abstract (written for scientists and not the same as the non-technical summary below), introduction, methods, results, discussion, conclusion, acknowledgements, and references. (Section requirements for proposals may vary.)
- The acknowledgements section should contain the name of your research mentor, the name of your project evaluator (if different), the names of anyone who helped you along with a brief description of how they helped, and your research funding sources if relevant (e.g. URSA grant or National Science Foundation grant to your mentor).
- Figures and tables should be effective and legible. They may be embedded where they are needed by the reader or placed at the end of the document. All figures and tables require an explanatory legend.
- References may be formatted as the author chooses (i.e. the format of a journal in the field) but formatting should be consistent throughout. All cited references must be included in the reference list, and all listed references should be cited within the text.
- Reports should be at least 8 double-spaced pages (excluding figures and references) and cite at least 10 relevant references.

Non-Technical Summary

Communicating scientific results to the public is an important aspect of research. In addition to the formal written report, capstone research findings must be communicated in the form of a short, non-technical summary. The summary should consist of one or two paragraphs (no more than one page) encapsulating the goal, approach, and findings of the study in language that could be understood by a non-scientist. This summary is different from the abstract within the written report, which will be written for a biologist.

Oral presentation

The findings of all capstone projects must also be communicated orally. Oral presentations may be delivered in class, at a scientific conference, at UAF Research Day, or in another mentor-approved setting. Digitally-illustrated oral presentations and poster presentations are the most common forms of oral presentation.

Assessment of the Research Capstone Project

The expectations and assessment of the capstone project are the same regardless of whether the capstone is completed within a designated course or by working individually with a faculty mentor. All capstone projects are assessed using a standard evaluation rubric, which is reproduced at the end of this syllabus. **A student must score "adequate" or above on all aspects of the evaluation in order to earn a passing grade on the capstone project.**

There are four possible grades for the BIOL F400 course, explained in the table below.

Grade	Interpretation
P	Pass - Indicates that the student earned a score of "adequate" or above on all points detailed on the capstone project evaluation rubric
DF	Deferred – Indicates that the student did not complete or pass a capstone project in the current semester. For example, the DF grade would be given if the project spanned more than one semester, or if the student did not receive "adequate" or above scores on the capstone evaluation form. When the student does pass a capstone project, the DF grade will be changed to a P.
W	Withdrew - A DF grade cannot remain on the transcript indefinitely. If after 2 year the BIOL F400 instructor does not extend the DF grade, it will convert to a W on the transcript.
F	Fail – Ordinarily, a student would not fail a capstone project, but rather would continue to revise the project until it received a passing grade. However, a student might receive an F as the consequence of a serious violation of the code of conduct.

Course Policies

All students are expected to be familiar with the UAF Student Code of Conduct and to follow it at all times. Academic dishonesty will not be tolerated. Acts of academic dishonesty will result in at least a failing grade for the current capstone project but may also result in more severe consequences, including expulsion from the University. Violations of the Code of Conduct will be reported to the UAF Dean of Students. Acts of academic dishonesty include, but are not limited to, the following.

- Plagiarism (see below)
- Cheating
- Fabricating data

- Obtaining an extension on an assignment or permission to miss a class through false pretenses
- Turning in an assignment that was prepared for a different class, unless you have received permission to do so
- Falsifying a grade record

Plagiarism is the use of ideas, text, or graphics that are not your own, without acknowledging the source. It is a serious form of academic dishonesty. Examples include the following.

- Copying text verbatim from a print source, including websites, books, reports, or articles, whether published or unpublished, without quotation marks and attribution
- Submitting work produced by a Artificial Intelligence tool without attribution, unless invited to do so by the course instructor
- Changing a few words within a copied block of text to obscure its resemblance to the original
- Presenting a graph or table created by someone else in a written document without attribution
- Presenting someone else's data without attribution
- Presenting someone else's ideas as your own without attribution

Special Deadlines for Students Working Individually with a Mentor
Extensions may be requested and will be evaluated on a case by case basis.

Fri 13 Sep 2024 midnight – Mentoring Agreement due. The Mentoring Agreement is not a requirement if you are taking a designated capstone course (e.g. BIOL F491); it is only a requirement if you are working individually with a mentor. If you need an extension, please contact the coordinator (dwagner10@alaska.edu).

Fri 6 Dec 2024, midnight – Final written work and signed evaluation form(s) to uaf-bw-dept@alaska.edu or dwagner10@alaska.edu. (If you are taking a class, the instructor will submit your materials.)

Support, Resources, Protections (syllabus addendum revised 9/13/2023)

Student protections statement: UAF embraces and grows a culture of respect, diversity, inclusion, and caring. Students at this university are protected against sexual harassment and discrimination (Title IX). Faculty members are designated as responsible employees which means they are required to report sexual misconduct. Graduate teaching assistants do not share the same reporting obligations. For more information on your rights as a student and the resources available to you to resolve problems, please go to the following site: https://catalog.uaf.edu/academics-regulations/students-rights-responsibilities/.

Disability services statement: I will work with the Office of Disability Services to provide reasonable accommodation to students with disabilities.

ASUAF advocacy statement: The Associated Students of the University of Alaska Fairbanks, the student government of UAF, offers advocacy services to students who feel they are facing issues with staff, faculty, and/or other students specifically if these issues are hindering the ability of the student to succeed in their academics or go about their lives at the university. Students who wish to utilize these services can contact the Student Advocacy Director by visiting the ASUAF office or emailing asuaf.office@alaska.edu.

Student Academic Support:

- Communication Center (907-474-5470, uaf-speakingcenter@alaska.edu, Gruening 507) ● Writing Center (907-474-5314, uaf-writing-center@alaska.edu, Gruening 801)
- UAF Math Services, uaf-traccloud@alaska.edu, Chapman 305 (https://www.uaf.edu/dms/mathlab/, for math fee paying students only)
- Developmental Math Lab (Gruening 406, https://www.uaf.edu/deved/math/) ● The Debbie Moses Learning Center at CTC (907-455-2860, 604 Barnette St, Room 120, https://www.ctc.uaf.edu/student-services/student-success-center/)
- For more information and resources, please see the Academic Advising Resource List https://www.uaf.edu/advising/students/index.php

Student Resources:

- Disability Services (907-474-5655, uaf-disability-services@alaska.edu, 104 Eielson Building) ● Student Health & Counseling **[6 free counseling sessions]** (907-474-7043, https://www.uaf.edu/chc/appointments.php, Gruening 215) ● Office of Rights, Compliance and Accountability (907-474-7300, uaf-orca@alaska.edu, 3rd Floor, Constitution Hall)
- Associated Students of the University of Alaska Fairbanks (ASUAF) or ASUAF Student Government (907-474-7355, asuaf.office@alaska.edu, Wood Center 119)

Nondiscrimination statement: The University of Alaska is an affirmative action/equal opportunity employer, educational institution and provider. The University of Alaska does not discriminate on the basis of race, religion, color, national origin, citizenship, age, sex, physical or mental disability, status as a protected veteran, marital status, changes in marital status, pregnancy, childbirth or related medical conditions, parenthood, sexual orientation, gender identity, political affiliation or belief, genetic information, or other legally protected status. The University's commitment to nondiscrimination, including against sex discrimination, applies to students, employees, and applicants for admission and employment. Contact information, applicable laws, and complaint procedures are included on UA's statement of nondiscrimination available atwww.alaska.edu/nondiscrimination.
For more information, contact:
UAF Office of Rights, Compliance and Accountability
1692 Tok Lane
3rd floor, Constitution Hall, Fairbanks, AK 99775
907-474-7300
uaf-orca@alaska.edu

Additional syllabus statement for courses that include off-campus programs and research activities:

University Sponsored Off-Campus Programs and Research Activities
We want you to know that:

1. UA is an AA/EO employer and educational institution and prohibits illegal discrimination against any individual: www.alaska.edu/nondiscrimination.
2. Incidents can be reported to your university's Equity and Compliance office (listed below) or online reporting portal. University of Alaska takes immediate, effective, and appropriate action to respond to reported acts of discrimination and harassment.
3. There are supportive measures available to individuals that may have experienced discrimination. 4. University of Alaska's Board of Regents' Policy & University Regulations (UA BoR P&R) 01.02.020 Nondiscrimination and 01.04 Sex and Gender-Based Discrimination Under Title IX, go to: http://alaska.edu/bor/policy-regulations/.
5. UA BoR P&R apply at all university owned or operated sites, university sanctioned events, clinical sites and during all academic or research related travel that are university sponsored.

For further information on your rights and resources visit the student placement guidelines page of the equity and compliance site.