

## Research Capstone in Biological Sciences

BIOL F400

Fall 2022, 0 credits, CRN 73093



### Course Coordinator

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### 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 receive occasional communications from the instructor and you are expected to keep the instructor informed about your progress.

Once you have completed the research project requirements and the faculty mentor confirms this is the case, the BIOL 400 instructor 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 in biological sciences is required of all students pursuing a B.S. degree in Biological Sciences. Students pursuing a B.A. may switch their catalog year to 2022-23 and do the Integrative Capstone in Biological Sciences (BIOL F410).

## **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 Find 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. Capstone 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 program description). 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, instructors will provide the Biology and Wildlife Department with a signed evaluation form and copies of the written assignments (the formal paper and the non-technical summary) to be archived by the department.

## **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 instructor (diane.wagner@alaska.edu) or the biology office manager (pthomas10@alaska.edu, 101 Murie) by Thu 3 Sep at 5pm at the latest (the day before the Add/Drop deadline) or risk being dropped from BIOL 400.** 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/forms).

If the research mentor is not a member of the Biology & Wildlife faculty, then an additional faculty evaluation completed by a [faculty member in the Biology & Wildlife Department](#) will be necessary. 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.

WHEN THE PROJECT IS COMPLETE AND HAS BEEN SATISFACTORILY EVALUATED, THE STUDENT SHOULD SEND THE FOLLOWING ELECTRONICALLY TO THE BIOLOGY AND WILDLIFE DEPARTMENT (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 instructor 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 assignment. This is typically a final report expressing the study goals, methods, findings, and conclusions written as a scientific paper, but may in special cases 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, and references. (Section requirements for proposals may vary.)
- 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.

### **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 instructor-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.

<b>Grade</b>	<b>Interpretation</b>
<b>P</b>	Pass - Indicates that the student earned a score of “adequate” or above on all points detailed on the capstone project evaluation rubric
<b>DF</b>	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.
<b>W</b>	Withdraw - 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.
<b>F</b>	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 (available online and in the UAF Catalog) 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 someone else’s ideas, text, or graphics 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
- 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

### **Important Deadlines for Students Working Individually with a Mentor**

These deadlines do not apply to students working in designated capstone courses. Extensions may be requested and will be evaluated on a case by case basis.

**Thu 8 Sep, 5pm (the day before the drop deadline)** – This is the deadline to submit completed Mentoring Agreement to the course coordinator. The Mentoring Agreement is not a requirement if you are taking a designated capstone course (e.g. BIOL F441 or F472); it is only a requirement if you are doing research with an individual mentor. Those not enrolled in a designated capstone course and lacking an approved mentorship form will be dropped from BIOL 400 on Fri 9 Sep.

**Fri 9 Dec 2021, 5pm** – deadline to submit final written work and evaluation form(s) to uaf-bw-dept@alaska.edu or [diane.wagner@alaska.edu](mailto:diane.wagner@alaska.edu)). If you need an extension, ask.

### **Support, Resources, Protections**

**COVID-19 statement:** Students should keep up-to-date on the university's policies, practices, and mandates related to COVID-19 by regularly checking this website:

<https://sites.google.com/alaska.edu/coronavirus/uaf?authuser=0>

Further, students are expected to adhere to the university's policies, practices, and mandates and are subject to disciplinary actions if they do not comply.

**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.

### **Student Academic Support:**

- Speaking Center (907-474-5470, [uaf-speakingcenter@alaska.edu](mailto:uaf-speakingcenter@alaska.edu), Gruening 507)
- Writing Center (907-474-5314, [uaf-writing-center@alaska.edu](mailto:uaf-writing-center@alaska.edu), Gruening 8th floor)
- UAF Math Services, [uafmathstatlab@gmail.com](mailto:uafmathstatlab@gmail.com), Chapman Building (for math fee paying students only)
- Developmental Math Lab, Gruening 406
- 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/lr/SKM\\_364e19011717281.pdf](https://www.uaf.edu/advising/lr/SKM_364e19011717281.pdf))

### Student Resources:

- Disability Services (907-474-5655, [uaf-disability-services@alaska.edu](mailto:uaf-disability-services@alaska.edu), Whitaker 208)
- Student Health & Counseling [**6 free counseling sessions**] (907-474-7043, <https://www.uaf.edu/chc/appointments.php>, Whitaker 203) (fall semester during renovations, Medical is in Arctic Health Research Bldg and Counseling is in Gruening Bldg)
- Center for Student Rights and Responsibilities (907-474-7317, [uaf-studentrights@alaska.edu](mailto:uaf-studentrights@alaska.edu), Eielson 110)
- Associated Students of the University of Alaska Fairbanks (ASUAF) or ASUAF Student Government (907-474-7355, [asuaf.office@alaska.edu](mailto:asuaf.office@alaska.edu), Wood Center 119)

**Nondiscrimination statement:** The University of Alaska is an affirmative action/equal opportunity employer and educational institution. 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 at [www.alaska.edu/nondiscrimination](http://www.alaska.edu/nondiscrimination). For more information, contact:

UAF Department of Equity and Compliance  
 1692 Tok Lane, 3rd floor, Constitution Hall, Fairbanks, AK 99775  
 907-474-7300  
[uaf-deo@alaska.edu](mailto:uaf-deo@alaska.edu)

Additional syllabi statement for courses including 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](http://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 [click here](#).