

## **Fish 493 Capstone Preparation, 1 credit (graded)**

### **Course description and aims:**

The capstone experience provides a unique opportunity to implement your degree learning in novel ways and to contribute to science early in your career. The aim of this first class is to help you develop a research proposal that will be used as a framework for your research in subsequent quarters. Your actual proposal will be developed with your advisor – this class supports your efforts and provides additional support in your writing. You are required to meet with the instructor (Dr Jensen) and identify a capstone advisor and research project before the quarter starts.

*Specific goals are:*

- To develop a clear understanding of research processes and issues in experimental design
- To learn to clearly articulate your research context, aims and objectives
- To write in a clear and concise manner a research proposal that articulates the context of your research, the aims and objectives of your proposed research, and the experimental design or research approach

The product of this class, a graded proposal, is required for registration in Fish 494, Capstone Research.

### **Instructor:**

Dr. Gregory Jensen, School of Aquatic and Fishery Sciences,  
Office: FSH Room 324B email: [gjensen@uw.edu](mailto:gjensen@uw.edu)

### **Meeting times:**

Weeks 1, 3, 5, 7, 9 Wednesday 3:30-5pm

### **Course website:**

Materials will be disseminated through the course Catalyst website. The website includes documentation outlining the capstone process, guidance on writing a proposal, and links to relevant supporting material.

### **Method of instruction:**

The class will be used to guide the development of your proposal in conjunction with your capstone advisor. Meeting times will be used to share your ideas with your colleagues and to develop your proposal. The first three weeks will be partly lecture-based, and will introduce you background necessary for proposal development. All classes will involve proposal discussion groups, where you will be encouraged to verbally present your ideas to four or five of your peers. You will formally present your research ideas in a short PowerPoint presentation in the last meeting. Each class has a task associated with it – you will be asked to contribute to the discussion board, upload files, or review your colleague's work before the class meets.

**Grading:**

Weekly activities: 10%

Annotated bibliography: 10%

Oral presentation of research question: 10%

Proposal: 70%. The final proposal will be graded using the rubric detailed below.

**Syllabus:**

<b>Session topic</b>	<b>Objectives and Activities</b>	<b>Deadlines</b>
Week 1: Introduction to the capstone process; lab and field safety requirements	Introduction to available facilities and equipment. Discuss research interests.	Identify your capstone research project and introduce yourself on the course discussion board. Schedule one-on-one meeting times with Dr Jensen.
Week 3: Experimental and sampling design, animal care and research topics.	Introduction to experimental design. Discuss research ideas with class members. Animal care and ethics discussion.	Submit a research topic title and brief summary of proposed project to discussion board.
Week 5: Structure of the research proposal; PowerPoint presentation requirements	Review the structure of the research proposal. Form student discussion groups of 4-5 based on interest areas. Peer review of annotated bibliography	Post an annotated bibliography with at least 10 references that support your proposal development.
Week 7: Peer review of draft proposals	Discuss proposal drafts with student group	Week 6: Submit draft proposal to peer group. Week 7: Read one proposal and submit comments online.
Week 9: Oral presentation of proposal to students in the group.	5 minute power point presentation of research proposal	Week 9: Submit two power point slides that clearly state the aims and objectives of your research, and describe your study system
Week 10		Submit research proposal to Dr Jensen and your capstone advisor

## Capstone proposal format

This outline is the format in which all *SAFS Capstone Proposals* and *SAFS Undergraduate Research Funding Requests* should be designed. The entire proposal should be about three pages in length.

### Due Dates

**Capstone Project Proposal:** Due to Faculty Sponsor, Worksite Supervisor and Capstone Coordinator (Dr Jensen) by Monday 5pm of week ten in the quarter of enrolment in Fish 493. *Entry codes for subsequent quarters in the capstone will not be given without an approved and graded proposal on file.*

**Capstone Research Funding Requests:** Capstone Coordinator (Dr Jensen) by Monday of week ten in the quarter of enrollment in Fish 493. In other words, the funding request should be submitted at the same time as the proposal.

### Format

The proposal should use correct scientific terminology, and citation of supporting references (follow the guidelines for the Transactions of the American Fisheries Society).

1. **Title**
2. **Abstract**—A short, descriptive summary of the proposal to follow.
3. **Introduction** (Approximately one page.)—What is the scientific context within which your project will be placed? Relate your proposed research to: (a) the existing state of knowledge, and (b) timely and interesting questions within the field/discipline.
4. **Aim and hypotheses** (one sentence each)—What is the general question your research will address (the aim)? What are the specific hypotheses you will be testing?
5. **Methods**—How will your experiment or project be organized? What data will you collect and how will you collect this data? Once in hand, how will your data be organized, analyzed, and presented? Methods section should contain:

**Data Collection** —Describe the methods, including a table of any equipment, supplies, transportation, etc., you will use to collect the data. Describe how these data address your question (the experimental design, if appropriate.) What is your sample size and why?

**Data Organization and Analysis** —Describe what you plan to do with your data. How will you bring your data together into a coherent form? Describe statistical methods used, if appropriate.

6. **Products and Timeline**—In bulleted or table format, list the specific product(s) you will produce (e.g. scientific paper, manual, website.) What is your proposed schedule for the data collection, data analysis, and completion of your product(s)? Be specific. Include a minimum of two meetings each quarter with your faculty sponsor and three meetings with your Worksite Supervisor. Make sure to pick a date toward the end of the quarter for an evaluation meeting.
7. **Signatures**—Please use the following statement:
8. "We have read and discussed the above proposal thoroughly and we believe this is an achievable yet challenging project for the student named. We have also discussed how the student will get any needed supplies, etc. for this project."
9. Include typed names and lines for signatures, and dates for all parties involved (Student, Faculty Sponsor, and Worksite Supervisor, if appropriate.)

**Grading Rubric on next page**

## Grading Rubric for capstone proposal

Component	Excellent	Good	Poor	Comments	Points
Abstract	Effective summary of the proposal; includes broader research context, identifies main questions, states aims and hypotheses, briefly describes research approach	Elements of the summary are missing; main question identified but should be clearer, aim and hypotheses can be summarized more effectively; elements of research approach not fully captured	Abstract is unclear, major elements are missing; research question not well described, aims and hypotheses not well articulated, experimental details are vague		10
Introduction	Effectively builds a case for conducting the research. The state of knowledge is comprehensively reviewed, the opportunities for research are identified, and the relationship between the proposed work and the opportunities have been clearly articulated	Builds a case for the research, but some sections are generally described. The state of knowledge has not been sufficiently reviewed but identifies primary papers; opportunities for research can be described more effectively; link between opportunity and proposed work can be tighter	The case for conducting the research has not been sufficiently developed. Review is incomplete and relies on few references; opportunities have not been fully described		30
Aims and objectives	Aim is clear and succinct, objectives or hypotheses are well articulated and achievable	Aim is described but can be better explained, link between aim and hypotheses a little unclear	Aim is vague or unrealistic, hypotheses unrealistic or not specific		10
Methods	Methods are clearly linked to the hypotheses; experimental detail is clear and replicable; clear justification for sample sizes and statistical approaches	Methods are fairly well described, elements are missing; aspects of experiment are not fully justified	Methods are confusing, not clearly linked to the hypotheses or not achievable, insufficient detail on experimental design		30
Overall impression	Proposal informs reader; logical structure and smooth flow; clear argument; correct grammar, spelling and punctuation; correct use of references, and reference section appropriately formatted	Proposal provides logical structure; most transitions effective; some error in grammar spelling or punctuation; some error in reference formatting	Proposal confuses reader; poor organization, weak or missing transitions impede meaning; several errors in grammar, spelling or punctuation		20