

BIOL 195- Introduction to Marine Biology - September 2019 CRN44086

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Course description

Introduction to Marine Biology is a 2 credit elective course that introduces freshmen to marine biology using local ecosystems as vehicles to understand broader concepts. The course is held in the Biology Department on campus and at the Shannon Point Marine Station in Anacortes, WA. Emphasis will be placed on field observation of local ecosystems and organisms, particularly marine mammals and seabirds.

My goal is for you to become excited and inspired about marine biology as a career. Give how vast the field is, the class will focus on a tiny slice in order for you to become comfortable exploring more on your own after the class is over. We will begin with a broad view of marine ecology and conservation, and narrow our view down to the seabirds and marine mammals of the San Juan Islands. Basic research skills will be emphasized throughout the course.

Course objectives and learning outcomes

- You will become familiar with marine habitats and marine food webs.
- You will become familiar with common marine organisms.
- You will become familiar with identifying seabirds and marine mammals found in the San Juan Islands.
- You will become familiar with current issues in marine conservation in general, and marine mammals in particular.
- You will become familiar with making observations and developing scientific questions.
- You will become familiar with giving scientific presentations.

In order to fulfill these objectives, you will:

- Be engaged in activities to understand the information and practice science skills.
- Work in randomly-assigned groups to construct your own knowledge by solving problems.
- Give a presentation with another classmate on a marine conservation issue related to marine mammals.

Grading

Satisfactory/Unsatisfactory (S/U). You must earn at least 70% of the points in the class to pass the class.

- Individual participation (20%): attending class on time, reading notes for class, keeping a scientific journal, participating in discussions.
- Individual final quiz (30%).
- Paired scientific presentation (50%).

Class Schedule

Monday Sept. 16- WWU (09:30 – 12:00 h, 13:00 – 14:45 h).

- Introduction (09:30-10:00 h).
- Class norms, pedagogy, assignments (10:00-10:25 h).
- Marine habitats (10:25-10:50 h).
- Marine organisms: algae, plants, and animals (10:50-11:50 h).
- LUNCH
- Vertebrates (13:00-13:50 h).
- The Nature of Science (14:00-14:45 h).

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Tuesday Sept. 17- WWU (09:00 – 12:00 h, 13:00 – 14:45 h).

- Marine mammals (09:00-09:40 h).
- Food webs (09:40–10:10 h).
- Marine mammals and seabirds of the San Juan Islands (10:15–11:50 h).
- LUNCH
- Group pairing, topic choice, and presentation schedule (13:00-13:25 h).
- Nature of Science: questions and hypotheses (13:30–14:20 h).
- Getting ready for boat trips (14:20 – 14:45 h).

Wednesday Sept. 18- Shannon Point Marine Center (08:00 – 16:00 h).

- Boat trip: observations, developing questions (~09:00-12:00 h)
- LUNCH
- Develop questions and hypotheses (13:00-13:30 h).
- Share questions and hypotheses (13:30-14:00 h).
- Scientific presentations (14:00-15:30 h).

Thursday Sept. 19- Shannon Point Marine Center (08:00 – 16:00 h).

- Boat trip: observations, refining questions (~09:00-12:00 h).
- LUNCH
- Research at Western Washington University (13:00-14:00 h).
- Conservation of marine mammals (14:00-15:30 h).

Friday Sept. 20 (9:00 – 12:00 h, 13:00 – 14.45 h).

- End of course quiz and review of scientific journal (09:00-10:00 h).
- Proposal presentations (10:15-11:50 h).
- LUNCH
- Proposal presentations (13:00-14:30 h)

Assignment

Read Syllabus (*Canvas/Files*)

Read files for 190916 (*Canvas/Files/For 190916*)

Read For Conservation Topics (*Canvas/Files/Assignments*)

Email me presentation partner, and topics of choice

Read files for 190917, skim seabirds (*Canvas/Files/For 190917*)

Download files (*Canvas/Files/ Boat Trips*)

Find two scientists at WWU (Biology, SPMC, MACS
Environmental Sciences) doing marine research of interest

Read file for 190919 (*Canvas/Files/For 190919*)

Watch Steven Chew's five videos

on how to get the most out of studying by

(<https://www.youtube.com/watch?v=RH95h36NChI&t=2s>).

Scientific Journal (*Canvas/Files/Syllabus*)

Scientific Presentation (*Canvas/Files/Assignments*)

Due

Monday Sep 16 at 09:30 h

Monday Sep 16 at 09:30 h

Tuesday Sep 17 at 09:00 h.

Tuesday Sep 17 at 09:00 h.

Tuesday Sep 17 at 09:00 h.

Wednesday Sep 18 at 07:00 h

Thursday Sep 19 at 13:00 h

Thursday Sep 19 at 13:00 h

Friday Sep 20 at 09:00 h

Friday Sep 20 at 09:00 h

Friday Sep 20 at 09:00 h

-Presentation

Due: Friday September 20th 09:00 h

Aim: To develop science process skills by presenting a conservation-based report to non-specialists.

Rationale: A critical skill required of scientists is the ability to convey information in a thoughtful, convincing and coherent manner in oral form. Many scientists are not skilled in giving clear and concise presentations to other scientists, let alone to non-specialists such as funding, conservation or governmental institutions. In this assignment, you will give a presentation to present a cohesive, concise and **unbiased** description of the current status of knowledge on a particular issue AND to support your research proposal.

Science is a creative process. Describing and attempting to understand the world involves generating questions, formulating explanations, conducting observations and experiments, and assessing the significance of the results obtained. In order to learn to develop our own ideas and become scientists we have to be active research participants, not merely be told about the results of the work conducted by others. One of the hardest and most beautiful things in science is to formulate a good research question that is testable. It is where science becomes a creative process, almost an art. Generating an interesting, exciting and important question begins with placing such question in the appropriate theoretical framework: what is the problem to solve? Why is it important to solve this problem? To develop and strengthen your confidence and experience in generating research ideas you will propose to conduct a conservation-based study on marine mammals. You will not actually conduct the study, but develop the idea based on your field observations, reading of scientific literature, and critical thoughts.

Select a topic by 09:00 h on **Tue Sep 17th**. You will select a **marine mammal conservation topic** of *your interest*, but that is currently relevant. To identify a topic read the recommended readings on Canvas (file For Conservation Topics.pdf) and search online the databases available at Western (such as Web of Science or Google Scholar). You need to identify three topics of interest that are specific (narrow enough that you could in theory conduct a scientific study on them) and rank them in order of preference, I will review the selection and assign the topic that is most relevant;

Description:

- You will give a concise and unbiased presentation on the conservation topic that you selected as though it was given to government officials requesting information to make a management decision, this includes addressing biological, social and economic factors to justify your proposal and your own opinion of what actions to take.
- Notice that the topics will refer to an event or human activity and a marine mammal taxon or taxa. Your unbiased description should include the point of view from both components. That is, the impacts of a certain activity on the taxa but also the opinion of the stakeholders or carriers of the activity.
- Your presentation should include a brief description of the research that you propose to address the conservation issue.
- Please use publications from scientific journals that are peer-reviewed as references. (When in doubt, check the website for the journal or contact me.) There are many recent peer-reviewed publications so use them. Look in the following places for references: One Search Advanced or Web of Science (both through Western Libraries), Google Scholar, the starter references, the literature cited in the scientific papers you read and the literature cited in the books recommended on the syllabus. Let me know if you find a reference but cannot access it, I may be able to get the pdf file for you.
- *Do check what everyone else is presenting to avoid overlap in presentations.* This is particularly important if your presentation addresses marine mammals in general and not a particular species.
- You and your partner will have 10-12 min for the presentation and 3 min for questions, you will be cut off after this time.
- You will have to prepare, practice, and be ready to answer questions from the audience.
- I will need to receive the final file of the presentation at 9 h on the presentation day: Friday September 20th.

RUBRIC OF THE PRESENTATION

Organization (3 points)	Structure (4 point)	Completeness (5 points)	Appearance (4 points)	Performance (2 points)	Time (2 point)
Is there are short, descriptive title? Is the name of the presenter included? Is talk restricted to topic at hand? Is it clear what the talk is about? Are there conclusions at the end? Are the conclusions clear, supported by evidence and related to topic?	Does the talk follow a logical sequence? Is content accurate?	Is the conservation problem clearly stated? Are the two sides of the conservation problem discussed equally? Is there a research proposal that addresses the problem? Is there at least a case example for the problem? Are there suggested conservation actions? Are studies cited in slides to support statements made? Are studies acknowledged at the end using the format of <i>Conservation Biology</i> ?	Is there consistency in the talk (background, font, etc.)? Is the amount of material in each slide appropriate? Is the font size large enough? Is the font type easy to read? Is the spelling correct throughout the presentation? Is there enough contrast between text and background? Are the figures and tables large enough? Are sources of figures and photos acknowledged? Are new terms explained?	Is the pace of the talk appropriate? Is the volume sufficient? Does the speaker use the natural resting position? Are hands used appropriately? Is there frequent eye contact with all audience? Does the speaker use pauses instead of fillers? Does the speaker enunciate clearly? Does speaker appear confident? Are questions answered appropriately?	Is there enough time for questions? Is the talk long enough?

See student examples on Canvas/Files/Assignments/Presentations.

-Boat Trips

Wednesday and Thursday September 18th and 19th

Aim: To develop science process skills by observing and developing scientific questions, and to be excited about the marine environment.

To bring:

- Outdoor clothing for cold and windy weather, including a rain jacket.
- Comfortable shoe wear, which may get wet.
- Water bottle with water.
- Snacks, if you need more than breakfast and lunch.
- Cell phone with e-documents from Canvas.
- Scientific journal and writing utensils (developing questions).
- Camera (if you have it).
- Binoculars (if you have them). We will bring some to share.

We will depart at 07:45 h. We will pick sack breakfasts & lunches from the university.

-Scientific Journal

Due: Friday September 20th 09:00 h

Scientists must keep careful notes and drawings about their initial observations, ideas, questions, experimental designs, environmental factors, and results. Keeping a good notebook is a very important part of doing science. You should treat your notebook as a journal (a place to record your observations, questions, and thoughts), a data record, and an assignment (a place to answer assigned questions).

For your Journal:

1. Start with a Table of Contents. Leave **at least two** full pages at the beginning of your journal for your table of contents. This section should contain the page numbers for daily reflection entries (see #4 below), data collection, notes, answers to assigned questions, and date. Entries should be clearly labeled for which daily assignment or topic they are associated with. For example:

TABLE OF CONTENTS

Date	Assignment/Content	Page(s)
9/9/13	Class notes on Life Habits of Organisms	5-8
9/9/13	Shannon Point field observations and data	9-13
9/9/13	Daily Reflection for Monday, Sept 9, 2013	14-15

2. Number every page in your journal.
3. Be organized. Title each entry in your Journal with **date** and the assignment name or purpose. Your instructors should be able to use your Table of Contents and find where entries start on particular pages. Try to keep your assignments in order and multiple parts of an assignment together as much as possible.
4. At the end of each day, create an entry for a **Daily Reflection**, which includes:
 - a. an account of everything you did that day
 - b. the main marine science concept(s) covered that day
 - c. at least one thing that excited or interested you from the day and why. For example, you could write about something you learned that you didn't know before, thought was really cool, etc.
 - d. at least one thing you still wonder about topics from the day
5. Demonstrate the time and effort you've spent in class or in the field. Quality and detail matter! Be thorough.
6. Write clearly. When answering assigned questions or composing daily reflections, write in complete sentences. (When taking your own notes and observations in the field, some amount of scribbles is ok.)
7. Drawings should follow the following guidelines:

Scientific drawings are an important part of biology. Drawings allow you to record an image of an organism you've observed and document the important features of the organism. Drawings are also used to share your observations with someone else. You don't have to be a good artist to make a good scientific drawing! The goal of the drawing is to provide information in an efficient manner. (A picture is worth a thousand words, as they say!) During this class, whenever you are asked to draw something, it should follow the scientific illustration format as much as possible.

 1. Observe your phenomenon (or organism) carefully. What are important features or behaviors of the organism? For example, what makes it different than another organism that might be similar? What is the shape of the organism's body? Does it have legs? How many?
 2. Draw only what you see. (Do **not** include what you **think** you should see!)
 3. Drawings should be done in pencil. If you do not use color, make sure to describe it in detail.
 4. Drawings should be large and clear so important features can be easily seen.
 5. Use distinct, single lines. (Avoid sketching.)
 6. All drawings should include:
 - a. Title & information (For example, the organism's name, the date and conditions you observed it)
 - b. Size scale
 - c. Labels pointing to important features using straight lines that do not overlap
 - d. Descriptions of texture, smell, behavior, color (if needed), and other observations

Inclusiveness and Respect

You are encouraged to speak up and participate during class. Because the class will represent a diversity of individual beliefs, backgrounds, and experiences, each one of us will respect, appreciate, and embrace every other member of this class.

I am firmly committed to diversity and equality in all areas of life. In this class, I will work to promote an inclusive environment where everyone feels safe and welcome. I recognize that discrimination can be direct or indirect and take place at both institutional and personal levels. I believe that such discrimination is unacceptable and I am committed to providing equality of opportunity for all by eliminating any and all discrimination, harassment, bullying, or victimization. The success of this policy relies on the support and understanding of everyone in this class. We all have a responsibility not to be offensive to each other, or to participate in, or condone harassment or discrimination of any kind. Without failing to speak up, we also have the opportunity to think the best of everyone and give one another the benefit of the doubt.

Equal Opportunity Rights

You have the right to an educational experience that is free from illegal harassment or discrimination on the basis of race, color, creed, religion, national origin, sex, disability, age, veteran status, sexual orientation, gender identity or expression, marital status or genetic information. If you believe you have experienced harassment or discrimination, inform me, an instructor you feel is an ally, one of the two Biology faculty members on the College's Equity, Inclusion, and Diversity Committee (Ben Miner and José Serrano-Moreno), or using the anonymous form under the Equity and Inclusion tab on the Biology Department homepage: <https://cse.wvu.edu/biology/form/equity-and-inclusion-issues-biology#overlay-context=biology>

Intellectual Honesty

Science is based on trust. If a scientist states that she carried out a particular study and obtained certain results, the rest of us trust that she did such thing. This is one reason why there is no tolerance for people who are not intellectually honest, and this class will be no exception.

<https://wp.wvu.edu/academichonesty/>

From WWU: Plagiarism is presenting as one's own in whole or in part the argument, language, creations, conclusions, or scientific data of another without explicit acknowledgement. Examples include but are not limited to:

- Using another person's written or spoken words.
- Using information from a World Wide Web site, CD-ROM or other electronic sources.
- Using statistics, graphs, charts and facts without acknowledging the source of the ideas.
- Paraphrasing, which is using someone else's argument without acknowledging the source by imitating the argument using other words.

[Understanding and Avoiding Plagiarism](#)

Religious Accommodations

Western provides reasonable accommodation for students to take holidays for reasons of faith or conscience or for organized activities conducted under the auspices of a religious denomination, church, or religious organization. Students seeking such accommodation must provide written notice to their faculty within the first two weeks of the course, citing the specific dates for which they will be absent.

“Reasonable accommodation” means that faculty will coordinate with the student on scheduling examinations or other activities necessary for completion of the course or program and includes rescheduling examinations or activities or offering different times for examinations or activities.

Additional information about this accommodation can be found in [SB 5166: Providing religious accommodations for postsecondary students](#).

Resources

Do you have any concerns about your ability to learn in the classroom or your ability to take assessments in the classroom? Contact the Disability Access Center for advice, help, and to request accommodation (650-3844 or <https://disability.wwu.edu/>).

Do you feel unwell or have a health-related question? Contact the Health Center (650-3400) or visit the website of Student Health (http://www.wwu.edu/chw/student_health/).

Do you have an emotional or psychological concern or question? Contact the Counseling Center (650-3400) or visit the website of Counseling Services (<http://www.wwu.edu/counseling/>).

Do you have a safety concern? Contact the University Police (650-3555) or visit their website (<http://www.wwu.edu/ps/police/index.shtml>).

Do you have a family or personal crisis or emergency? Contact the Dean of Students (650-3450) or visit their website (<https://wp.wwu.edu/students/>).

Have you or someone you know experienced bias of any kind on campus? Contact the Equal Opportunity Office for advice and help. (<http://www.wwu.edu/eoo/bias-incident-response.shtml>).

Do you have concerns related to being an undocumented student? Contact Student Outreach Services. (<https://wp.wwu.edu/sos/undocumentedstudents/>).

Do you have financial difficulties? Go to the Financial Aid Services Center and schedule an appointment with a financial aid counselor (http://www.finaid.wwu.edu/client_services/pages/contact.php)

Do you identify as a member of the LGBTQ+ Community? Learn about resources and support by emailing L. K. Langley (they/them/theirs) at L.K.langley@wwu.edu or by visiting <https://lgbtq.wwu.edu/>

Do you or someone you know need confidential support related to sexual violence? Contact CASAS (650-3700 or <https://pws.wwu.edu/consultation-and-sexual-assault-support-casas>), the Student Health Center, and/or the Counseling Center.

To report sexual violence, please contact University Police, Bellingham Police, and/or the Title IX Coordinator in Western's Equal Opportunity Office (650-3307). Faculty are required to report sex discrimination, including sexual violence that they learn about to the Title IX Coordinator.

Are you or someone you know in distress? Help is available anytime, all the time. <https://suicideprevention.wwu.edu/get-help/>