

COURSE SYLLABUS

MARINE BIOLOGY

BIOL 110 / WINTER 2025

Tuesday & Thursday
8:30 – 10:20am

47° 20'5 5.825" N
122° 19' 27.757" W

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*“Fish, amphibian, and reptile, warm-blooded bird and mammal—
each of us carries in our veins a salty stream in which the elements sodium, potassium, and calcium
are combined in almost the same proportions as in sea water.”*

Rachel Carson, *The Sea Around Us* (1951)

Course Description

A survey of the animals, algae, and plankton of Puget Sound. Includes field study and laboratory.
(*Winter 20205 Course Catalogue*)

Course Overview

Why does the water turn extra green and murky every spring? Why are there only 74 Southern Resident Killer Whales left? What was a *Mola mola* (Ocean Sunfish) doing in front of MaST? What's the coolest fish in Puget Sound, and why is it the Pacific Spiny Lumpsucker?

This 5-credit course provides an overview of the organisms, ecosystems, and biophysical processes of Puget Sound, including its role within the Salish Sea and our global ocean. Through lectures, labs, and field study at Highline College's Marine Science and Technology (MaST) Center, we will explore the biology of our unique marine environment as well as its human connections and implications. As this is a Hybrid class, we will meet in person on Tuesdays and Thursdays for lecture and lab, and you will be expected to complete another course session on Canvas at the time of your choosing (ideally Friday).

To many, studying marine biology is synonymous with adventure: you truly never know what the ocean will throw at you. We will observe how marine biology is inherently interdisciplinary, requiring us to make deeper connections to our environments, our cultures, our histories, and each other. Additionally, we will continue to practice analysis and communication in service of being critical and caring humans on our blue planet.

Student Learning Outcomes

The following Student Learning Outcomes have been established by Highline College for this course:

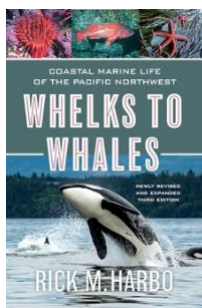
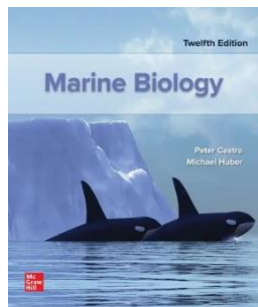
1. Observe and identify common marine animals, algae, and plankton of Puget Sound and surrounding areas.
2. Describe the major groups of marine animals and explain their evolutionary relationship.
3. Describe the basic anatomy, natural history and behavior of marine animals including: sponges, cnidarians, mollusks, marine worms, arthropods, brachiopods, bryozoans, echinoderms, and chordates (fish, reptiles, birds, mammals).
4. Compare and contrast the features of invertebrates vs. vertebrates.
5. Compare and contrast the features of cartilaginous fish (sharks, rays) vs. bony fish (rockfish, salmon).
6. Describe the habitat, distribution and behavior of local orcas.
7. Compare and contrast baleen whales vs. toothed whales.
8. Identify three common types of marine algae (green, red, brown) and describe their distribution.
9. Explain major factors that influence marine productivity and the growth of plankton and algae.
10. Describe human impacts on the marine environment including ocean acidification, climate change and pollution.

Course Prerequisites

Prerequisite: MATH 081 or higher (minimum grade of 2.0)

Placement Eligibility: Math 91 or higher

Textbooks & Required Materials



Castro & Huber, *Marine Biology* (12e). ISBN 1260722198.

Harbo, *Whelks to Whales* (3e). ISBN 1550179837.

A letter-sized (8.5x11) notebook that you only use for this class.

↑ Bring these three to class every single day!

All other readings are uploaded to Canvas (canvas.highline.edu), and all other materials will be provided in class.

Canvas & Computer Stuff

Because this is a hybrid course, you will be expected to spend a significant amount of time working online, and will need a reliable computer with high-speed internet. There are also 74 computers available for your use in the Highline College Library, where you can also print, copy, and scan. (The library is usually closed on Saturdays so please plan accordingly.)

Highline College uses Canvas as our Learning Management System. If you are having issues with Canvas please contact Highline's IT Help Desk at <http://helpdesk.highline.edu>/or via phone at (206) 592-4357.

Instructor Availability

My office hours this term are by appointment, and I'm happy to chat over Zoom. Monday-Friday I endeavor to respond to your emails within 24 hours, though emails sent on Friday may not receive a response until Monday. I'm also always happy to come to class early or stay late to meet as long as I have a little heads up.

Lab / Field Work / Fashion



As Norwegian preschoolers are taught, *Det finnes ikke dårlig vær, bare dårlig klær.* (There's no bad weather, only bad clothing.) Every day you come to MaST you should be prepared to potentially be outside. (Even if the only thing on the schedule for that day is a lecture, the bay and the aquarium is a wild place and you never know what we're going to get ourselves into. Necropsying a dead animal on the deck or running out onto the pier if orcas are passing is always a possibility!) The MaST is also a busy public aquarium facility with staff and volunteers engaged in the work of feeding hundreds of animals and maintaining a huge amount of infrastructure behind the scenes (and if we're appropriately kitted out, we can help)! In sum, and especially because it is Winter Quarter and our classroom is literally on a pier over the water, please wear close-toed shoes, warm layers, and bring a rain jacket if rain is in the forecast.

Course Assignments & Grading

Your grade breaks down as follows:

5 Quizzes (50 pts each)	250 pts
10 Labs (20 pts each)	200 pts
Species Report	50 pts
Final Project	250 pts
Final Exam	250 pts
Total	1000 pts

Our 10-week quarter goes by *very* fast! It is critical that you stay on top of readings and assignments, because it's difficult to catch up once you fall behind. If something happens this term that affects your ability to keep up with the work load please let me know as soon as possible so we can come up with a plan.

To take a little pressure off, I also implement these measures: To start off strong, you may retake Quiz 1 as many times as you want, and I'll count the highest grade. Also, I will replace your lowest lab grade with your average lab grade.

Quizzes close at 11:59pm the day they are due. If you miss it you must arrange a time with me to take the quiz in person.

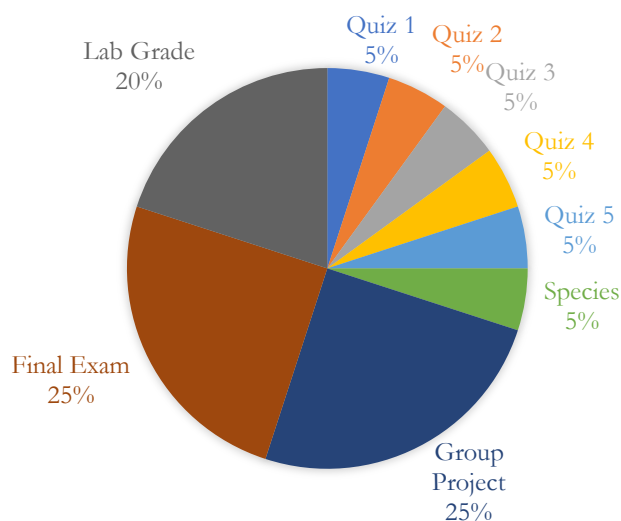
To receive credit for a lab course in the Life or Physical Sciences you must attend at least 75% of labs as scheduled.

Do. Not. Miss. Class. Class is not simply a recitation of the textbook. It is labs, field study, and making critical connections between the general material of the textbook and our Salish Sea ecosystem. If you must miss a class it is your responsibility to get any notes or assignments. When you have read this please email me a photo of a hagfish.

Grades are assigned as follows:

4.0 = 95% +	3.3 = 88%	2.6 = 81%	1.9 = 74% (C)	1.2 = 67% (D+)	0.5 = 59%
3.9 = 94% (A)	3.2 = 87% (B+)	2.5 = 80% (B-)	1.8 = 73%	1.1 = 66%	0.4 = 57%
3.8 = 93%	3.1 = 86%	2.4 = 79%	1.7 = 72%	1.0 = 65%	0.3 = 55%
3.7 = 92%	3.0 = 85%	2.3 = 78%	1.6 = 71%	0.9 = 64% (D)	0.2 = 53%
3.6 = 91%	2.9 = 84% (B)	2.2 = 77% (C+)	1.5 = 70% (C-)	0.8 = 63%	0.1 = 51%
3.5 = 90% (A-)	2.8 = 83%	2.1 = 76%	1.4 = 69%	0.7 = 62%	0.0 = 0-50%
3.4 = 89%	2.7 = 82%	2.0 = 75%	1.3 = 68%	0.6 = 61% (F)	

Only grades of a 0.7 or above will earn credit at Highline. Below 0.7, the assigned grade is a 0.0. Any course used for credit in the AA and AS degrees must be a 1.0 or better.



Academic Honesty

Students are expected to maintain a high standard of honesty in their academic work. Cheating and plagiarism are specifically prohibited under the college's Student Rights and Responsibilities provisions. Here are some guidelines:

- Acts of cheating may include submitting for credit work that is not the student's own, including text from a generative AI such as ChatGPT, copying examination answers from fellow students or other sources or assisting other students in acts of these kinds, and plagiarism (which can take many forms, including failing to cite sources, copying sources without quotation, or inadequately paraphrasing or synthesizing source materials).
- Academic dishonesty of any kind may result in a failure on the assignment and possible disciplinary action from the college in accordance with Highline College's [Student Conduct Process](#). It is both your right and responsibility to be familiar with the document entitled [Student Conduct Code WAC 1321-126](#).
- Quizzes 1-4 will be taken on Canvas. They are open book, but you will take these *alone*.
- **AI-generated text such as ChatGPT will not be accepted in this class.** I want to hear *your* thoughts, words, and perspectives. Furthermore, please remember that AI like ChatGPT has only the goal of giving you *an* answer—it doesn't care about the correct answer, and will often make up incorrect information and cite completely fake sources. Your assignments, as well as quiz answers on Canvas, will be randomly screened for AI-generated text. These tools do have valid uses in the world, but your Marine Biology class is not one of them.

Accessibility & Access Services

If you have already established accommodations with Access Services, please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course. If you have not yet established services through Access Services, but have a temporary health condition or permanent disability that requires accommodations (conditions include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), please contact Access Services at 206-592-3857, access@highline.edu or [access.highline.edu](https://www.highline.edu/access). You deserve a learning environment that is accessible to you!

Grievance Procedures

I hope that you will communicate with me right away if you experience anything in this course that does not support an inclusive learning environment. You can also report any incidents you may witness or experience on campus through the following procedures:

- **For Instructional Grievances:** In the case of a complaint about a course, students are encouraged to speak with their instructor first, and if the matter is not resolved, students should then contact the division chair. For more detail, see the [Instructional Grievance Process](#) in the Highline catalog.
- **For Title IX (Discrimination and Sexual Harassment):** It is the policy of Highline College to provide equal opportunity in education and employment and not discriminate on the basis of race, color, national origin, age, disability, sex, sexual orientation, marital status, creed, religion, or status as a veteran of war as required by Title IX of the Educational Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975, [RCW 49.60.030](#) and their implementing regulations. Prohibited sex discrimination includes sexual harassment (unwelcome sexual conduct of various types). For more detail see [the Title IX page](#) on the Highline website.

College Policies

For information on college policies on diversity, classroom behavior, incompletes, absences for religious reasons, student grievances, withdrawals, Faith and Conscience statement, and emergency procedures please refer to College Policies document provided by your instructor or on the Canvas course page.

Student Resources

The college offers many resources to support student achievement and success. These include faculty advising, the Academic Success Centers (math, writing, and general tutoring), the college library, and technical support. For more detailed information on these services, please refer to College Policies document provided by your instructor or on the Canvas course page.

- **Academic Success Centers:** Trained and certified peer tutors assist students in math, writing, and a variety of subject areas in a constructive, student-centered environment. Drop-in, group tutoring, one-on-one consultations, and workshops are free to all currently enrolled students. (tutoring.highline.edu)
- **Writing Assistance:** For advice with any stage of drafting your writing assignments, visit the Writing Center. Writing consultants can help you understand assignments, brainstorm ideas, develop thesis statements, organize your writing, learn to edit your papers, and more! (writingcenter.highline.edu)
<https://writingcenter.highline.edu/>

Advising

Advising is a collaborative partnership between you and your advisor. Your advisor can teach you how to find information to make the most of your college experience. In your first advising meetings, you will create a plan together for courses and/or a degree based on your educational goals. Your advisor can connect you to a network of resources and support services whether you are facing obstacles or just need more information. It is suggested to meet with your advisor once per quarter. To request a Faculty Advisor, fill out the [advisor request form](#).

Basic Needs Resources

If you are experiencing homelessness, food insecurity, financial hardship, or are in need of other basic needs support, please utilize the resources found on the Basic Needs Resources link on the Canvas course page. I am also very happy to connect you with Highline's many resources.

Inclusivity

You belong here. This term we are going to learn about the incredible diversity of our Earth's ocean. These ecosystems thrive *because* of their diversity, not in spite of it. It is my goal to make sure that students of all identities have their learning needs met and feel supported and affirmed for who they really are. I expect the same from every member of our class community to make our classroom a safe place to learn. You belong here with all of your different intersecting perspectives, abilities, histories, and backgrounds, and as your instructor I'm here to help you stay and succeed.

Territorial Acknowledgement

We would like to acknowledge the people whose land we are gathered on today. Present day Des Moines is located on the traditional village sites of the Muckleshoot, Puyallup and many other Coast Salish tribes who made their homes on these lands and along these waters. Let us also acknowledge the robust Indigenous communities made up of tribal diversity that originate from around the country, and whose journeys have brought them here and to other locations by ways of forced displacement or seeking opportunities. Today the same communities celebrate their heritage, showing resilience and tenacity that would be greatly admired by their ancestors.



BIOL 110 / WINTER 2025

COURSE CALENDAR

Readings are listed on the day they will be discussed in class, so please arrive having read and taken notes. As this is a hybrid course, the  icon indicates work that you will do during your third (asynchronous) class session of the week. Schedule subject to change if necessary.

PART I: The Principles of Marine Science

WEEK 1	Tu 1/7	Intro to the Course and to MaST	03:49 AM 4.37 10:23 AM 12.97 05:34 PM 1.58	
	Th 1/9	Studying Marine Biology in the Salish Sea  Lab 1: Identification and Observation	06:18 AM 7.94 11:50 AM 12.42 07:26 PM -0.95	
		Familiarize yourself with, and complete the first tasks on, our Canvas course page.  Reading: Ch. 1: The Science of Marine Biology UNESCO 7 Ocean Literacy Principles Watch “People of the Salish Sea” from the film <i>Clearwater</i> <i>Optional:</i> “How eDNA is Changing the Way Scientists Track Species in Puget Sound”		
WEEK 2	Tu 1/14	Biophysical Processes	06:26 AM 13.02 11:50 AM 7.66 04:14 PM 11.02 11:19 PM -2.05	
	Th 1/16	Biophysical Processes Continued  Lab 2: Intro Lab Safety and Plankton Tow	07:25 AM 12.83 01:15 PM 6.44 05:54 PM 10.12	
		Review Chapters 1-4 and take Quiz #1 by Friday 1/17 at 5pm.		

PART II: The Organisms of the Sea

WEEK 3	Tu 1/21	The Ocean Under Our Microscope 🔍 Lab 3: Light Trap	03:07 AM 5.50 09:44 AM 11.72 04:58 PM 2.61 11:46 PM 8.27	
		 Reading: Ch. 5: The Microbial World E. Wagner, "The Ups and Downs of Zooplankton in Puget Sound"		
	Th 1/23	Seaweeds and Seagrasses	02:04 AM 9.08 05:15 AM 8.47 10:56 AM 10.85 06:39 PM 1.13	
		 Reading: Ch. 6: Multicellular Primary Producers: Seaweeds and Plants <i>Whelks to Whales</i> Ch. 12: Seaweeds and Seagrasses <i>Optional:</i> Watch "Kelp: Hidden Treasure of the Salish Sea"		
		 Get a head start on next week (all inverts both days!): Ch. 7 + <i>Whelks</i> Ch. 1-8.		

WEEK 4	Tu 1/28	Marine Invertebrates: Friends & Anemones	05:35 AM 12.35 10:47 AM 8.28 03:09 PM 10.94 10:23 PM -2.17	
		 Reading: Ch. 7: Marine Animals Without a Backbone <i>Whelks to Whales</i> Ch. 1-8: All the Inverts <i>Optional:</i> "Taxonomic Guide to Benthic Invertebrates of Puget Sound"		
	Th 1/30	Even More Marine Invertebrates: Giant Octopuses, Stubby Squid	06:23 AM 12.80 11:55 AM 6.76 04:48 PM 11.16 11:45 PM -1.90	
		🔍 Lab 4: Squid Dissection		
		 Reading: Review Ch. 7: Marine Animals Without a Backbone Review <i>Whelks to Whales</i> Ch. 1-8: All the Inverts <i>Optional:</i> F. Jabr, "Can We Really Be Friends with an Octopus?" (<i>Hakai</i>)		
		 Next week is another <i>big</i> week of critters, get ahead on Ch. 8-9!		
		 Reading: Ch. 8: Marine Fishes + Ch. 9: Marine Reptiles, Birds, and Mammals		

WEEK 5	Tu 2/4	Marine Fishes: Enormous Rockfish & Ancient Sharks	02:34 AM 4.22 08:54 AM 12.98 03:53 PM 1.06 10:27 PM 9.26	
		🔍 Lab 5: Scientific Illustration		
		 Reading: Review Ch. 8: Marine Fishes <i>Whelks to Whales</i> Ch. 9: Fishes Memorize: Pietsch & Orr, "Fishes of the Salish Sea: A Compilation and Distributional Analysis" (kidding, just have a look through it)		
	Th 2/6	Marine Reptiles, Birds, and Mammals: Orcas in Danger	12:27 AM 9.56 04:42 AM 7.93 10:20 AM 11.94 05:56 PM -0.23	
		 Reading: Review Ch. 9: Marine Reptiles, Birds, and Mammals <i>Whelks to Whales</i> Ch. 10: Marine Mammals <i>State of the Salish Sea</i> , Birds of the Salish Sea (p. 46), Orcas (p. 172-79)		

PART III: Structure and Function of Marine Ecosystems

WEEK 5	 Review Chapters 5-9 and take Quiz #2 by Friday 2/7 at 5pm.	
	 Reading: Ch. 10: An Introduction to Marine Ecology <i>Optional:</i> K. Zimmer, "What's in a Fish's Name?" (<i>Nautilus</i>)	
WEEK 6	Tu 2/11 The Intertidal Zone  Lab 6: Urchin Dissection	05:27 AM 12.52 10:56 AM 6.81 03:32 PM 10.68 10:25 PM -1.12
	 February 12, 2024 is the 50th anniversary of the Boldt Decision , the legal culmination of the "Fish Wars" here in the Northwest. I'll talk a bit about the case in class tomorrow as we discuss salmon, but please also take a look through the resources provided on Canvas.	
	Th 2/13 Salmon and Our Salish Sea Estuaries	06:15 AM 12.39 12:04 PM 5.37 05:07 PM 10.42 11:39 PM 0.07
	 Reading: Ch. 12: Estuaries: Where Rivers Meet the Sea <i>State of the Salish Sea</i> , Estuarine Biogenic Habitats (p. 31-43), Case Study: Salmon Marine Survival (p. 166-70) Salish Sea Marine Survival Project, "Young Salmon Are Dying in the Salish Sea" + scroll through "Researching and Restoring Nearshore Habitat" Listen: "Tribal Hatcheries and the Road to Restoration" (<i>Hakai</i>)	
	 Review Chapters 10-13 and take Quiz #3 by Friday 2/14 at 5pm.	
	Read Chapter 14: Coral Reefs for interest and joy, but you will not be quizzed on it. Next Thursday I'll tell you a bit about our incredible deep-water corals in the Salish Sea.	
WEEK 7	Tu 2/18 Epipelagic Life Great and Small  Lab 7: Light Trap and Plankton Tow	01:55 AM 5.11 08:07 AM 11.55 03:00 PM 1.97 09:31 PM 9.15
	 Reading: Ch. 13: Life on the Continental Shelf Ch. 15: Life Near the Surface	
	Th 2/20 The Deep Sea: Bone-Eating Snotflowers and Bony-Eared Assfish	03:20 AM 7.80 09:07 AM 10.52 04:38 PM 1.40
	 Reading: Ch. 16: The Ocean Depths S. DeWeerd. "The Unseen Deep Sea Legacy of Whaling" (<i>Nautilus</i>) S. Lindsay, "Debt to the Bone-Eating Snotflower" <i>How Deep is the Ocean?</i> Interactive Story Map	
	 Finish Group Presentation Proposal, due in class Tuesday morning.	

PART IV: Humans and the Sea

WEEK 8	Tu 2/25	What We Take...	04:24 AM 11.64 09:46 AM 7.61 02:13 PM 10.34 09:18 PM -1.19	
		 Reading: Ch 17: Resources from the Sea <i>State of the Salish Sea</i> , Extraction (p. 77-79), <i>State of the Salish Sea</i> , Indigenous Management Systems (p. 226-232) Morin, Evans, & Efford, "Urbanization and the Collapse of Forage Fish" <i>Optional:</i> B. Borrell, "How to Love an Oyster" (<i>Sierra</i>) + <i>Salish Sea</i> , Olympia Oysters (p. 48)		
	Th 2/27	...and What We Leave  Lab 8: Marine Debris	05:06 AM 12.26 10:47 AM 5.54 04:00 PM 11.15 10:42 PM -1.07	
		 Reading: Ch. 18: The Impact of Humans on the Marine Environment <i>Whelks to Whales</i> Ch. 13: Non-Native, Introduced, and Invasive <i>State of the Salish Sea</i> , Inputs from Human Activities (p. 64-76) <i>State of the Salish Sea</i> , Invasive European Green Crab (p. 186-89)		
		  Reading: <i>State of the Salish Sea</i> , Urbanization and Human Impacts to the Seascape (p. 50-96)		

WEEK 9	Tu 3/4	Humans and the Changing Salish Sea	01:33 AM 4.37 07:29 AM 12.70 02:21 PM -0.32 09:04 PM 10.51	
		 Reading: <i>Salish Sea</i> , Climate Change: Global Problem, Local Impacts (p. 98-151) <i>Listen:</i> "When Whales and Humans Talk" (<i>Hakai</i>) <i>Optional:</i> "Puget Sound Perceptions of Environmental and Climate Change"		
	Th 3/6	Salish Sea Case Study: Basking Sharks in the Northeast Pacific  Lab 9: Species ID Lab Review	03:28 AM 7.53 08:51 AM 11.44 04:16 PM -0.41	
		 Review Chapters 15-18 and take Quiz #4 by Friday 3/7 at 5pm , then finish and practice group presentations.		

WEEK 10	Tu 3/11	Group Presentations!	05:18 AM 11.90 11:02 AM 5.67 03:51 PM 9.89 10:27 PM 0.21	
	Th 3/13	Final Exam Review Session  Lab 10: Species ID Quiz #5 Obstacle Course	06:02 AM 11.80 12:03 PM 3.98 05:29 PM 10.19 11:43 PM 1.30	
		 Reading: <i>State of the Salish Sea</i> , Opportunities for Improving Assessment and Understanding of the Salish Sea (p. 194-235) Kelsey & Broadhurst, "Why Evidence-Based Hope is Crucial to Salish Sea Recovery and Beyond"		
		 Study for final exam next week! Exact date and time of final exam TBD.		