

## Course Syllabus: Phytoplankton Ecology

Oregon Inst. of Marine Biology, Fall 2021

CRN: 16920/16922 \* Course Number: BI457/557 \* 5 credits

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**GE:** Maureen Heaphy: [mheaphy4@uoregon.edu](mailto:mheaphy4@uoregon.edu)

### Class time:

Tuesdays (subject to minor adjustments, 8:30-5)

Note there will be some fieldwork on Thursday of Week 3 with the Biological Oceanography Class

**Office Hours:** I will be available all day for in-person office hours on Wednesday, by appointment or 'drop-in'. If you want to go over anything in the lab, I am happy to spend time on Tuesday evening or Wednesday evening, as well as during the day on Wednesday. I am staying in the gatehouse cottage and, if you see me down there, and want to talk, it is fine to knock on the door.

**Email and Zoom Office hours:** Please use regular email, not Canvas, as it is quicker and more reliable.

Begin the subject line with : PHYTO: or Phyto: and use a 'top-loaded' format (i.e. newest first). I will search on "Phyto:" each evening and morning to be sure I do not miss your emails. I am commuting between Eugene and Charleston so I will be in Eugene on most weekends. I am happy to Zoom with you, and will check email regularly every day.

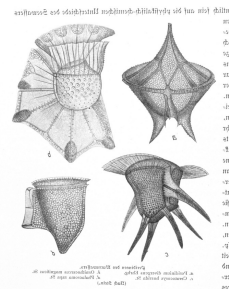
**Brief Description:** At least half the primary production on Earth is done by the drifting primary producers of the ocean. We will look at the extraordinary taxonomic diversity of phytoplankton, the role of both benthic and planktonic representatives of major taxa like diatoms and dinoflagellates in estuarine and coastal ecosystems, and investigate key social and environmental problems involving phytoplankton like harmful algal blooms, coastal eutrophication/hypoxia, and impact of climate change on phytoplankton-based food webs. Includes field trips to seagrass beds, mudflats, and coastal waters.

### Learning Outcomes:

- 1) Students will develop skill in studying and identifying phytoplankton; they will also gain knowledge of the diversity, evolution, and ecology of phytoplankton and their role in marine ecosystems.
- 2) Being a scientist involves a lot of creative thinking and evaluation; this course will increase students' ability to focus on the details and message of scientific papers and improve their ability to discuss the content and merit of scientific papers.
- 3) One cannot succeed in science without being a writer, and students in this course will begin to develop a sense of themselves as 'writers', not just as investigators who use writing as a tool. We will approach writing as a craft and use our reading of the scientific literature as an opportunity to develop writing and editing skills.

### Basic Course Format:

Generally, we will begin each week with lecture and discussion in the boathouse, then sample, have lunch, and spend the afternoon with lab activities. You will have assigned readings each week and some assignment(s) to do that will help guide discussion and provide opportunity to develop critical thinking and your skill as a writer. These activities will constitute 50% of your course grade (5 pts. Per week). You will get feedback on your work, and full credit as long as it is clear that you were engaged with the material and making an effort to think, be



curious, and express yourself clearly. If work one week is not really acceptable for 100% credit, you will get a 'warning'; in other words, you will still get 100% credit that week, but you will also get an explanation of why your work really was not quite deserving of the "A+" and, the next week, you may get reduced credit if improvement is not made.

Weekly sampling: Phytoplankton are microscopic, photosynthetic, single-celled organisms. There are hundreds of species of phytoplankton and, at any given time, the community in the water column may be comprised of quite a few species. Since they grow fairly quickly, and our Oregon coastal waters have a lot of variation in the amount of nutrients in the water during the year (and even from week-to-week), we will use weekly plankton sampling as a core of our lab activities. This will:

1. help you learn to identify them
2. help you attune to the tides and gradual change in the plankton
3. provide a data base for a simple writing assignment
4. provide context for discussion of biodiversity measurement and assessment.
5. provide context for discussion of the concept of 'community'

Each week we will discuss one or more scientific papers – guided

1. for learning of content
2. develop critical thinking and vocabulary
3. help you critique your own work (and others) by having studied published papers carefully

Each week we will try to do some evaluation of your own work (peer-to-peer) - guided

1. to help you organize your thoughts and improve expression
2. to help you write clearly and in a scientific format

We will also:

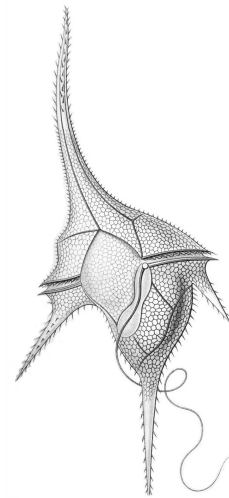
1. try to isolate some strains into culture
2. do an experiment on feeding by zooplankton
3. develop your own experiment
4. participate in the Week 3 diurnal study of Biological Oceanography

These activities will give you some tools to use in a small experiment or study, and also, perhaps, in future research. They will add tools to your toolbox for a project so you can frame a good scientific question that can be answered experimentally, or by collecting observational data. They will also help you learn more about phytoplankton!

#### **GRADING:**

50% Weekly Assignments  
25% Mid-term  
25% Personal Project

Weekly Assignments: As described above, you will receive Full Credit unless warned that they are not reflecting engagement with the material. You will often also get a quality grade with explanation. This



*Ceratium hirudinella*  
Drawing by Ernst Haeckel  
Wikipedia-Public Domain

quality grade does not 'count', but should help you understand my grading standards. Philosophically, I agree with the guidelines of the Dept. of Human Physiology's "Grade Culture" although for many lab activities, the 'rarefied' standard for an A+ is not so rigidly applied as I think 100% effort, regardless of outcome often deserves full credit. Please check out the website. These ideas can be applied to any work you do for any course as a way to self-grade and will benefit you in the long run.

<https://physiology.uoregon.edu/undergraduate/grade-culture/>.

The personal project will take the form of a short piece of scientific writing that involves proposing (and perhaps doing) a small experiment or observational study that uses the skills and information learned in this class. You will be working on this after the mid-term as part of the weekly assignments; portions may be turned in in advance of the due date in Week 10 for provisional grades. This is due Finals Week.

## TEXTBOOKS

*Writing Science: How to write papers that cited and proposals that get funded*

by Joshua Schimel

ISBN-13: 978-0199760244

ISBN-10: 0199760241

Any bookselling source is fine.

*Photographic Atlas of Marine Life*

Gary D. Wisehart, E.C. Rempala, M. J. LeBoffe

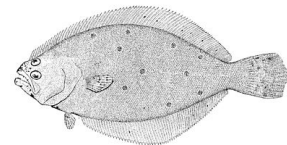
Morton Publishing

978-0895827852

Paper version available online through Amazon and other similar sources.

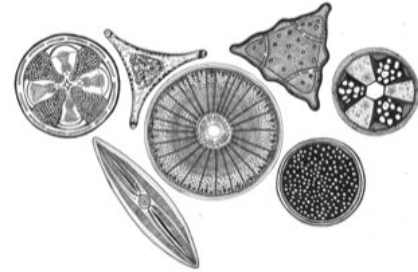
E-version available through [RedShelf](#) and [Vitalsource](#)

**Academic Integrity:** Ideas and creative expression are the cornerstone of the intellectual life of the University. Plagiarism and other forms of dishonesty in the academic endeavor are thus contrary to the goals of the University and an enlightened life, just as personal integrity, collaboration and honest sharing of ideas (with credit given where it is due) is part of the path to new knowledge and a just society. Students are expected to adhere to University policy on academic misconduct and are responsible for consulting with the instructors if they have any questions about proper procedures for attribution, cooperative projects, or other acts that might be construed as plagiarism or other forms of misconduct. It is your responsibility to verify that any action that might be construed as academic misconduct is approved by the instructor BEFORE you take it! So, feel free to ask. Also see guidelines at <http://policies.uoregon.edu/vol-3-administration-student-affairs/ch-1-conduct/student-conduct-code> and information about plagiarism at <http://researchguides.uoregon.edu/citing-plagiarism>.



**Inclusivity and Accessibility:** Freedom of academic inquiry, equity among our entire diverse array of students, and responsiveness to individual needs so that everyone is able to perform at their best are all core values for the UO and the Ocean Planet Team. Accommodations for documented disabilities will be made most easily if you let us know as soon as possible what accommodations are needed. For some

accommodations, you may need register with the Accessible Education Center (<https://aec.uoregon.edu>) but if any aspect of the course is causing difficulty of access for you, please speak to an instructor whether or not you are also working with the AEC. While we cannot all totally understand each other's personal experiences, we can all work to eradicate discrimination and we can all share and benefit from each other's perspectives with respect and generosity. Courtesy and thoughtfulness will enrich our journey together this term, and are expected from everyone.



**Students with Disabilities:** *The University of Oregon is working to create inclusive learning environments. Please notify me if there are aspects of the instruction or design of this course that result in disability-related barriers to your participation. You are also encouraged to contact the Accessible Education Center in 360 Oregon Hall at 541-346-1155 or [uoaec@uoregon.edu](mailto:uoaec@uoregon.edu).*

### **Prohibited Discrimination and Harassment Reporting**

Any student who has experienced sexual assault, relationship violence, sex or gender-based bullying, stalking, and/or sexual harassment may seek resources and help at [safe.uoregon.edu](http://safe.uoregon.edu). To get help by phone, a student can also call either the UO's 24-hour hotline at 541-346-7244 [SAFE], or the non-confidential Title IX Coordinator at 541-346-8136. From the SAFE website, students may also connect to Callisto, a confidential, third-party reporting site that is not a part of the university.

*I am a [designated reporter/student-directed employee]. For information about my reporting obligations as an employee, please see [Employee Reporting Obligations](#) on the Office of Investigations and Civil Rights Compliance (OICRC) website. Students experiencing any form of prohibited discrimination or harassment, including sex or gender-based violence, may seek information and resources at [safe.uoregon.edu](http://safe.uoregon.edu), [respect.uoregon.edu](http://respect.uoregon.edu), or [investigations.uoregon.edu](http://investigations.uoregon.edu) or contact the non-confidential Title IX office/Office of Civil Rights Compliance (541-346-3123), or Dean of Students offices (541-346-3216), or call the 24-7 hotline 541-346-SAFE for help. I am also a mandatory reporter of child abuse. Please find more information at [Mandatory Reporting of Child Abuse and Neglect](#).*

### **Absences and Late Work:**

The immersive nature of classes at OIMB and the full-day meeting plan mean that it is very important for you to attend all classes and lectures. However, I realize that care with health and exposure to Covid, necessary travel, and other unexpected issues may make it necessary for you to miss class. If you are going on the Young research cruise, please notify me immediately so that I can work with you to arrange makeup material. We cannot re-do many labs or experiments, but I will work with anyone who has an unavoidable absence to make sure you succeed in the class. All weekly assignments do need to be turned in if you want to receive credit. Late Policy (unless otherwise specified for an assignment) is 15% off if turned in after we have discussed the work in class, or if it is 24 or more hours late, whichever occurs first.

Images: Dinoflagellates: Ernst Haeckel, Public Domain

Diatoms: NOAA/Olivia Curtis, gr. 11, Falmouth HS, Falmouth. *Diatom*

Fish: Images were published by the US Fish and Wildlife Service and are not copyrighted. They were published in *Fishes of the Gulf of Maine* by H. Bigelow and W. C. Schroeder (1953) <https://www.nefsc.noaa.gov/lineart/>