

Marine Botany
BIOL U5501/5502
Fall, 2011

Instructor: Donald Cheney, Office: at MSC
Tel: 617, 373-2489; email: d.cheney@neu.edu;
Web site: www.biology.neu.edu/faculty03/cheney03.html
Office hrs: by appointment and at lunch or after class on Friday

TA Liz Hanlon - hanlon.el@husky.neu.edu

Lecture and Lab: Normally 9:00-5:00, Fridays at MSC

Textbooks:

1. *Illustrated Key to the Seaweeds of New England*, by Martine Villalard-Bohnsack (2nd ed.) - required
2. *Seaweeds of Long Island Sound* by Peg Van Patten (2006) – recommended
3. Optional book not available in bookstore (you have to order yourself) – *Seaweeds. A colour guide to common benthic green, brown and red algae of the world's oceans*, by W. Braune and M. Guiry (2011); it's very expensive – \$85!

Tentative Lecture and Laboratory Schedule (& low tides for Boston)

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| Sept. 9
(3:48 pm) | Lectures: 1).Introduction to the course; 2) Overview on the importance & variety of marine plants & algae; 3) Introduction to structure & diversity of Greens
Lab: Examination of common intertidal species; use of keys, making herbarium specimens |
| Sept. 16
(8:13 am) | Lecture: Completion of Greens; Structure & diversity of Browns
Lab: Collecting and identification of Greens & Browns |
| Sept. 23
(1:48 pm) | Lecture: Structure & diversity of Reds
Lab 1): Collecting and identification of Reds
Lunch (Pizza) Discussion – Independent Research Projects & teams |
| Sept. 30
(7:40 am) | Annual field trip to Cobscook Bay, Maine
On Sept. 29 th - <u>Annual Cobscook Bay Seaweed Scavenger Hunt !!</u> |

- Oct. 7 (2:35 pm) Lecture: Salt marsh communities – Distribution & species composition
Lab: Trip to the “Great Marsh” of Ipswich (plus trip to Russell’s Orchard for donuts, cider & fruit wine)
Deadline for picking Research Project teams & genera topic
- Oct. 14 (7:04 am) Lecture: Salt marsh communities – importance & threats
Lab: Preliminary Project Proposals due & initial meetings with Research Project teams
- Oct. 21 (12:39 pm) Lectures: 1) Reproduction & evolutionary strategy of Greens, Browns & Reds; 2) Invasive species
Lab: Identifying seaweed reproductive structures
- Oct. 28 (6:27 am) Mid-term lecture and lab exams !!
Lab: Work on your projects
- Nov. 4 (1:07 pm) Lecture: Phytoplankton (diatoms & dinoflagellates): taxonomy & ecology
Lab: Identification of diatoms and dinoflagellates
- Nov. 11 (4:58 am) Lecture: Cyanophyta (Blue-Green Algae) and Harmful Algal Blooms (HABs)
Lab: 1) Identification of blue-greens; 2) Progress meetings with Research Project teams
- Nov. 18 (10:14 am) Lecture: Seagrasses & mangroves
Lab: work on your projects
- Nov. 25 (4:55 pm) Thanksgiving break – no class !!
- Dec. 2 (10:30 am) Lecture: Seaweed uses now & in future; seaweed aquaculture
Lab: Carrageenan extraction; “Annual Seaweed Buffet”; free time to work on projects & herbaria
- Dec. 9 Project Powerpoint Presentations at the “Annual Student Research Project Symposium” at noon; Research Project Written Reports due !!
- Dec. 16 Final Lecture Exam (no lab exam)! Herbaria due

Course Objectives, Requirements & Grading

The principal goal of this course is to introduce students to the major groups of marine macro- and microscopic algae, as well as marine plants. Although there is an emphasis on the flora of the Gulf of Maine, examples from the tropics and west coast will also be given. In addition to receiving classical training in the identification of macroscopic algae and salt marsh plants, you will learn the latest information on the origin and evolutionary relationships of marine algae, as well as an understanding of how they have adapted to stress-inducing biotic and abiotic factors. In addition, current hot topics such as the use of algae for biofuels and problems with invasive species will be covered, as well as their commercial importance and biotechnological / biomedical uses.

There are three laboratory requirements: 1) a laboratory practical exam (on Oct. 28), 2) a herbarium of at least 28 local macroalgae, seagrasses and salt marsh plants, and 3) an independent research project. For the latter, students will design and complete an independent research project of their choosing. The goal of this research project is to act as a “pilot” study that can be completed in just 2-3 wks of work to test an original hypothesis. To conduct the projects, students will work in teams of 3 or 4 individuals to learn teamwork and help each other in data collection and analysis. The findings of the Research Projects will be presented by the team in a scientific-meeting manner in a Symposium at the end of the course and as a written report.

Key dates for Research Project Preparation, etc

Sept. 23	Luncheon Discussion on Research Project ideas & teams
Oct 7th	Deadline for selecting Research Project teams and idea for topic
Oct. 14th	Research Project Proposal “3-pager” due; includes list of team members, project title, goals, rationale, general approach and at least 3 references; Meet with Cheney & Hanlon to discuss project
Nov. 11	Meetings with Cheney & Hanlon to discuss progress, problems, etc
Dec. 9	Powerpoint presentation (ca 20 min long) at noon; Written Report due

Finally, here is how your final grade for the course will be determined:

1. Cobscook Bay Scavenger Hunt top score	5%
2. Herbarium (28 spp minimum)	10%
3. Research project Powerpoint talk	15%
4. Research project written report	15%
5. Mid-term lecture exam	25%
6. Mid-term lab practical	10%
7. Final exam	20%