

FAS6176: ALGAE BIOLOGY AND ECOLOGY

Instructor: Professor Edward Phlips

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Course Description: The biology and ecology of aquatic algae, including evolution, classification, structure, photosynthesis, growth, and reproduction. Emphasis on the ecological role of algae in different aquatic ecosystems (e.g. open ocean, estuaries, coral reefs, rocky intertidal), their impacts (e.g. harmful algae blooms, food webs), and their applications (e.g. food, biochemical).

Prerequisites: Foundational biology coursework, as determined by instructor

Time and Place:

Lectures (Online): Lecture modules will be posted on the e-Learning web site for the course on Monday of each week, along with required reading and supplemental information. Each online distance learning program has a process for, and will make every attempt to resolve, student complaints within its academic and administrative departments at the program level. See <http://distance.ufl.edu/student-complaints> for more details.

Course Objectives: After completing the course, students will:

- be able to apply the principles of algal biology and ecology to solve problems, or identify opportunities;
- be able to identify algae management schemes which will address issues of eutrophication, human health, and global climate change;

Course Communication: This course will take advantage of e-Learning support to post course information and to allow you day-to-day access to your grades. Please visit <http://lss.at.ufl.edu> to access the course via the e-Learning link and for information on how use the e-Learning site (Please use the help desk as your first course of action if you have any difficulties). Lectures are based on PowerPoint presentations to facilitate the use of figures and visual aids. Not all the information for the class will be on the PowerPoint slides, therefore it is your responsibility to take notes and complete reading assignments.

Participation and Attendance: Participation and attendance is expected for all lectures, discussions, and special project presentations. Contact me as early as possible if you must legitimately miss a scheduled exam. If an emergency situation arises immediately before an exam, notify me as soon as the emergency is resolved. Make-up exams will not be given except for an excused absence with written substantiation (e.g., official University event, illness, family

emergency, etc.).

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Required Readings: Course reading material will be composed of several foundational scientific papers, as well as recently published scientific and technical papers. These are five examples:

Cloern, J.E. 2001. Our evolving conceptual model of the coastal eutrophication problem. *Marine Ecology Progress Series* 210:223-253.

Litchman, E., and C.A. Klausmeier. 2008. Trait-based community ecology of phytoplankton. *Annual Reviews Ecology Evolution and Systematics* 39:615-639.

Nisbet, E.G. and N. H. Sleep. 2001. The habitat and nature of early life. *Nature* 409:1083-1091.

O'Neil, J.M., T.W. Davis, M.A. Burford and C.J. Gobler. 2012. The rise of harmful cyanobacteria blooms: The potential roles of eutrophication and climate change. *Harmful Algae* 14: 313-334.

Szmant, A. 2002. Nutrient enrichment on coral reefs: Is it a major cause of coral reef decline? *Estuaries* 25:743-766.

Course Format and Grading: This course is offered for three (3) credits in the spring semester. Exams will be based on material presented in the lectures and the required readings. Required readings will be provided online for each major topical area.

Twelve short quizzes will be administered during the term. The online quizzes will involve five multiple choice questions related to that week's lecture and/or reading material, some of which may contain multiple correct answers. Each question will be worth a maximum of 0.4 points, for a total of 2 points/quiz. Persons which get >1.2 points on a quiz will receive the full 2 points for the quiz.

The special project will involve the development of a 7-8 minute (approximate) voice over Power Point presentation on a special topic. Three parts of the project will be due during the semester:

Part 1: Submission of topic. Selection of project topic in communication with the instructor (2 grade points).

Part 2: Submission of detailed outline (i.e. 1-2 pages) for the proposed presentation, including at least three of the seven required references (10 grade points).

Part 3: The PowerPoint presentation should include a list of at least seven references from the primary literature. The presentations will be placed online for viewing by all students in Week 15 of the course. Grading - 20 points for the presentation (8 points for visual content, 8 points for narration content, 4 points for referencing). Students will also get 4 points for evaluating Project outputs of a selected subset of the other PowerPoint presentations. Evaluations will be based on a scale of 1-3 (1 – low quality, 2 – moderate quality, 3 – high quality). During the evaluations each person will be asked to enter brief comments on the presentation they are assigned to evaluate (e.g. strong point and/or weak point).

Detailed instructions on how to submit projects and participate in grading will be provided on the e-Learning web site at the beginning of the semester.

Two exams will be administered online during the course. Each will be worth up to 20% of the grade. The exams will not be cumulative in terms of the material covered. Exam questions will emphasize lecture materials, but may also include general concepts presented in the required reading. The exams will be an hour and a half in length and will be available online Wednesday-Sunday of exam week. Exam questions may include multiple-choice and essay. The essay questions may incorporate concepts presented in the required reading material.

The grade point allocation is: A (93-100%), A- (90-92), B+ (86-89%), B (82-85%), B- (78-81%), C+ (74-77%), C (67-73%), C- (63-66%), D+ (59-62%), D (55-58%), D- (51-54%), and E (<50%).

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

Basis for grade:

Quizzes (12)	24%
Exam 1	20%
Exam 2	20%
Special Project Part 1	2%
Special Project Part 2	10%
Special Project Part 3	20%
Participation in Project	4%
Evaluation & discussion	

Course Outline

<u>Week</u>	<u>Topical Areas, Tests and Assignments</u>
Week 1	Introduction & course description
Week 2	Origins of algae Environmental changes and evolution of algae Phylogeny of algae Systematics basics Reading assignments Online Assignment 1
Week 3	Algae structure & function – by division Reading assignments Online Assignment 2
Week 4	Algae structure & function – by division – continued

	Reading assignments Online Assignment 3
Week 5	Freshwater algae toxins Reading assignments Online Assignment 4
Week 6	Marine algae toxins Other harmful effects of algae Reading assignments Online Assignment 5
Week 7	Plankton sampling methods Benthic algae sampling methods Taxonomic methods Reading assignments Online Assignment 6
Week 8	Exam 1 Special Project Part 1 due: Topic selection
Week 9	Spring break
Week 10	Photosynthesis – Structures, processes, methodologies Growth – Dynamics, physical limiting factors, methodologies Reading assignments Online Assignment 7
Week 11	Growth – Chemical limiting factors, methodologies Reading assignments Online Assignment 8 Special Project Part 2 due: Outline of planned project content
Week 12	Ecological principles – e.g. eutrophication, hydrologic factors, food webs, climatic factors Reading assignments Online Assignment 9

- Week 13 Examples of ecosystem types
- Reading assignments
 Online Assignment 10
- Week 14 Examples of ecosystem types - continued
- Reading assignments
 Online Assignment 11
- Week 15 Algal applications
- Reading assignments
 Online Assignment 12

Special project Part 3 due: Power Point presentations

- Week 16-17 Exam 2**
Peer Evaluations for Special Project due.

Online Course Evaluation Process: Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>.

Academic Honesty: As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *“We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.”* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”*

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

Campus Helping Resources: Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, www.counseling.ufl.edu/cwc/*
 - Counseling Services
 - Groups and Workshops
 - Outreach and Consultation
 - Self-Help Library
 - Wellness Coaching
- *Career Resource Center, First Floor JWRU, 392-1601, www.crc.ufl.edu/*

Services for Students with Disabilities: The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation

0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

Software Use: All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.