

FAS6176: ALGAE BIOLOGY AND ECOLOGY – Spring 2024

Instructor: Professor Edward Phlips

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Office Hours: Thursday 8-10 AM

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 describe the basic concepts of algal biology and ecology, and how they apply to different aquatic environments,
- 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 environmental issues, such as 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.

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 weekly 'Special Assignments' will consist of 12 short quizzes that 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, 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 course will also involve a Special Project during the semester. The final product of the project will be a short voice-over Power Point presentation (i.e., around 8-15 minutes) on a topic of your choice. Three parts of the project will be due during the semester:

Part 1: Selection of project topic and submission of an outline. Possible topical areas include - algae species of particular ecological importance (e.g., harmful algae bloom species, unique structure and/or function, major habitat component, important food web species), important processes associated with algae (e.g., primary production, nitrogen fixation), the role of algae in specific ecosystems (e.g., kelp forests, Atlantic Sargassum communities, Lake Okeechobee, Florida Bay), or algal biotechnology (biofuel production, aquaculture). Outline of the main elements of the project, including some examples of references that will be used for major topical areas. On time submission of topics will be associated with 8 points.

Part 2: The PowerPoint presentation should include a list of at least ten references from the primary literature (e.g., journal articles, reference books, published agency reports). The presentations will be placed online for viewing by all students in Week 15 of the course.

Grading - 25 points for the presentation. Each student will be assigned to do an evaluation of another student's presentation (3 points). The evaluation (e.g., strong point and/or weak point) should be entered onto the presentation.

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 one hour in length and will be available online: Exam 1 February 26 - March 2, Exam 2 April 22 – April 27. Exam questions will include short answers and short essays.

The overall grade point allocation - A (90-100%), 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	8%
Special Project Part 2	25%
Participation in Project review	3%

Course Outline

<u>Week</u>	<u>Topical Areas, Tests and Assignments</u>
Week 1	Introduction, course description, Origins of algae
Week 2	Environmental changes and evolution of algae Phylogeny of algae Systematic 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	Harmful freshwater algae Reading assignments Online Assignment 4
Week 6	Harmful marine algae Other harmful effects of algae Reading assignments Online Assignment 5
Week 7	Algal sampling methods Taxonomic methods Reading assignments Online Assignment 6
Week 8	Exam 1 – March 3-7, 2025
Week 9	Photosynthesis – Structures, processes, methodologies Growth – Dynamics, physical limiting factors, methodologies Reading assignments Online Assignment 7
Week 10	Spring Break
Week 11	Growth – Chemical limiting factors, methodologies Reading assignments Online Assignment 8 Special Project Part 1 due by March 29, 2025
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

Special project due: Power Point presentations by April 16, 2025

Week 15 Algal applications

Reading assignments
Online Assignment 12

Peer Evaluations for Special Project due by April 24, 2025.

Week 15-16 **Exam 2 – April 24 to April 28, 2025.**

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.

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. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at: <https://gatorevals.ua.ufl.edu/students/>. Students will be notified when the evaluation

period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at: <https://gatorevals.aa.ufl.edu/public-results/>.

Academic Honesty

UF students are bound by The Honor Pledge which states “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students 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.” The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. See the [UF Conduct Code website for more information](#). If you have any questions or concerns, please consult with the instructor or TAs in this class.

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). 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: (New Link: <https://policy.ufl.edu/regulation/4-040/>)

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general wellbeing 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.

Whole Gator App

The Whole Gator and website and app connects UF students with resources dedicated to supporting overall health and well-being. In addition to many of the resources below it also has strategies to practice self-care. <https://one.ufl.edu/whole-gator/topics>

Health and Wellness

- U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.
- Counseling and Wellness Center: [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non- crisis services.

- Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website](#).
- University Police Department: [Visit UF Police Department website](#) or call 352- 392-1111 (or 9-1-1 for emergencies).
- UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#).
- GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the [GatorWell website](#) or call 352-273- 4450.
- Student Success Initiative, <http://studentsuccess.ufl.edu>.

Academic Resources

- E-learning technical support: Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at helpdesk@ufl.edu.
- [Career Connections Center](#): Reitz Union Suite 1300, 352-392- 1601. Career assistance and counseling services.
- [Library Support](#): Various ways to receive assistance with respect to using the libraries or finding resources. Call 866-281-6309 or email ask@ufl.libanswers.com for more information.
- [Teaching Center](#): 1317 Turlington Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.
- [Writing Studio](#): Daytime (9:30am-3:30pm): 2215 Turlington Hall, 352-846-1138 | Evening (5:00pm-7:00pm): 1545 W University Avenue (Library West, Rm. 339). Help brainstorming, formatting, and writing papers.
- Academic Complaints: Office of the Ombuds; [Visit the Complaint Portal webpage for more information](#).
- Enrollment Management Complaints (Registrar, Financial Aid, Admissions): [View the Student Complaint Procedure webpage for more information](#).

Student Complaints:

- Online Course: <https://pfs.tnt.aa.ufl.edu/state-authorization-status/#student-complaint>

