

## Term Information

Effective Term Summer 2019

## General Information

Course Bulletin Listing/Subject Area Evol, Ecology & Organismal Bio  
Fiscal Unit/Academic Org Evolution, Ecology & Org Bio - D0390  
College/Academic Group Arts and Sciences  
Level/Career Graduate, Undergraduate  
Course Number/Catalog 5440  
Course Title Plankton Ecology  
Transcript Abbreviation Plankton Ecology  
Course Description Material in this course focuses on the ecology of freshwater plankton (both phytoplankton and zooplankton) and the advanced study of lake ecology. The study of plankton ecology is central to understanding lake food web structure and production, which is important to fisheries, biogeochemistry, and freshwater responses to anthropogenic activities.  
Semester Credit Hours/Units Fixed: 3

## Offering Information

Length Of Course 14 Week, 12 Week, 8 Week, 7 Week, 6 Week, 4 Week  
Flexibly Scheduled Course Never  
Does any section of this course have a distance education component? No  
Grading Basis Letter Grade  
Repeatable No  
Course Components Field Experience, Laboratory, Lecture  
Grade Roster Component Lecture  
Credit Available by Exam No  
Admission Condition Course No  
Off Campus Never  
Campus of Offering Columbus

## Prerequisites and Exclusions

Prerequisites/Corequisites Ecology of Inland Waters (EEOB 5420)  
Exclusions  
Electronically Enforced Yes

## Cross-Listings

Cross-Listings

## Subject/CIP Code

Subject/CIP Code 26.1304  
Subsidy Level Doctoral Course  
Intended Rank Senior, Masters, Doctoral

## Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

## Course Details

### Course goals or learning objectives/outcomes

- Explain how physiochemical and biological variables shape the structure and function of plankton communities
- Explain how the structure and function of plankton communities is influenced by anthropogenic change.
- Use models of plankton succession to explain temporal changes in plankton communities.
- Identify common plankton species and describe their natural history.
- Understand how to use and evaluate common statistical and modeling tools used in plankton ecology.
- Pose research questions related to plankton ecology and design approaches for addressing those questions

### Content Topic List

- Phytoplankton and zooplankton taxonomy and life history
- Impact of the physical and chemical environment on phytoplankton and zooplankton
- The role of plankton in lake food web dynamics, with specific focus on the controls of primary and secondary production
- Impact of anthropogenic change (climate change, eutrophication, overfishing, etc.) on plankton communities

### Sought Concurrence

Yes

## Attachments

- EEOB 5440 Syllabus.docx: Syllabus  
*(Syllabus. Owner: Hamilton,Ian M)*
- Re\_ Concurrence Request\_ EEOB 5440, Plankton Ecology.pdf: Concurrence - Earth Sciences  
*(Concurrence. Owner: Hamilton,Ian M)*
- Concurrence\_Form\_EEOB 5440\_SENR.pdf: Concurrence - SENR  
*(Concurrence. Owner: Hamilton,Ian M)*
- EEOB 5440 Concurrence list.docx  
*(List of Depts Concurrence Requested From. Owner: Hamilton,Ian M)*
- EEOB curriculum maps August 2018.xlsx: Curriculum Maps  
*(Other Supporting Documentation. Owner: Hamilton,Ian M)*

## Comments

## Workflow Information

| Status           | User(s)   | Date/Time           | Step                   |
|------------------|---|---------------------|------------------------|
| Submitted        | Hamilton,Ian M  | 08/21/2018 09:36 AM | Submitted for Approval |
| Approved         | Hamilton,Ian M  | 08/21/2018 09:36 AM | Unit Approval          |
| Approved         | Haddad,Deborah Moore  | 08/21/2018 10:53 AM | College Approval       |
| Pending Approval | Nolen,Dawn<br>Vankeerbergen,Bernadette Chantal<br>Oldroyd,Shelby Quinn<br>Hanlin,Deborah Kay<br>Jenkins,Mary Ellen Bigler | 08/21/2018 10:53 AM | ASCCAO Approval        |



**Syllabus for EEOB 5440:  
Plankton Ecology  
May 2019**

**Instructor:**

Jim Hood  
*Office:* 230 Research Center  
*Office Hours:* TBD  
*Office Phone:*  
*Email:* [hood.211@osu.edu](mailto:hood.211@osu.edu)  
*Teaching assistant:*

**Format:**

May semester  
Three credit hours;  
Lecture/Lab: 5 hour one day/week

**Prerequisites:** Ecology of Inland Waters (EEOB 5420)

**Required Text:** none

## Course Description and Learning Outcomes:

### Course description

Material in this course focuses on the ecology of freshwater plankton (both phytoplankton and zooplankton) and the advanced study of lake ecology. This course is designed for graduate and undergraduate students with an interest in freshwater and/or marine sciences or fisheries. Plankton are small microscopic organisms suspended in freshwater, consisting of cyanobacteria, algae, small crustaceans, and the eggs and larval stages of larger animals. The plankton are charismatic and central to the functioning of lake food webs and ecosystems. They convert light and nutrients into organic matter and are central mediators of both top-down and bottom-up dynamics. Thus, the study of plankton ecology is central to understanding lake food web structure and production, which is important to fisheries, biogeochemistry, and freshwater responses to anthropogenic activities.

### Learning outcomes

This course has three overarching goals. We will: (1) learn the essentials of plankton ecology, including natural history, ecology, and taxonomy; (2) use the study of plankton to explore limnology at an advanced level and understand limnological responses to the Anthropocene; and (3) hone various skills (e.g., reading, writing, quantitative) required to be an effective researcher or manager of inland waters. After successfully completing this course, students will be able to:

- Explain how physiochemical and biological variables shape the structure and function of plankton communities
- Explain how the structure and function of plankton communities is influenced by anthropogenic change.
- Use models of plankton succession to explain temporal changes in plankton communities.
- Identify common plankton species and describe their natural history.
- Understand how to use and evaluate common statistical and modeling tools used in plankton ecology.

- Pose research questions related to plankton ecology and design approaches for addressing those questions

## Assessment

### Point breakdown

| Assessment/Assignment | Points each | Number | Total Points |
|-----------------------|-------------|--------|--------------|
| Exercises             | 75          | 3      | 150          |
| Research proposal     | 100         | 1      | 100          |
| Research presentation | 100         | 1      | 100          |
| Research paper        | 300         | 1      | 300          |
| Participation         | 100         | 1      | 100          |
| Discussion synopses   | 12.5        | 4      | 50           |
| Final                 | 200         | 1      | 200          |
| <b>Total Points</b>   |             |        | <b>1000</b>  |

### Major assessment components

**Research proposal, presentation, and paper:** This is a small group project in which students pose a research question related to plankton ecology and address it using existing, long-term datasets of lake physiochemistry and plankton (which are common and public in the field). To facilitate success, this project will be subdivided into clear milestones: development of question and approach (one-page research proposal), completion of analyses (15-minute research presentation), and final product (~10-page research paper).

**Final exam:** The final exam will consist of both multiple choice and short answer questions. Multiple choice questions focus on plankton identification and natural history, while short answer questions focus on lecture material, exercises, and the primary literature discussed in class.

**Participation score:** In-class participation during lectures, discussions, and field trips is key to the success of this course. Students will be assessed on their contribution to these events.

### Field trips

We will take two local field trips during lab hours, one to Alum Creek reservoir and another to a local fishless pond (*TBD*). We will also take one multiday (Friday to Sunday) field trip to Ohio State Universities Stone Lab on Lake Erie. Because this trip will extend beyond normal class time, it is not explicitly required *but attendance is strongly requested*. If you cannot attend, separate arrangements will be made to provide appropriate assessment.

For all field trips, student transportation will be provided by bus. Students should be prepared to dress appropriately and expected to bring along (or acquire) their own food (except for the Stone Lab trip).

## Detailed schedule

### Class

Three days a week, two hours per day

| Day | Topic for week                              | Lecture subtopics                                  | Activities                    |
|-----|---|--|-------------------------------|
| 1   | <i>Taxonomy, physics, food web dynamics</i> | Taxonomy, life history                             |                               |
| 2   |   | Physical environment: temperature, buoyancy, light |                               |
| 3   |   | Feeding behavior, food web dynamics                | Plankton bingo                |
| 4   | <i>Eutrophication &amp; HAB's</i>           | Introduction                                       |                               |
| 5   |   |  | Primary literature discussion |
| 6   |   |  | Group discussion              |
| 7   | <i>Climate change</i>                       | Lake temperatures, mixing, ice cover               |                               |
| 8   |   | Phenology, food web dynamics, HABs                 |                               |
| 9   |   |  | Primary literature discussion |
| 10  | <i>Stable states &amp; regime shifts</i>    | Stable states, identifying regime shifts           |                               |
| 11  |   |  | Primary literature discussion |
| 12  | <b>Final Exam</b>                           |  |                               |

### Lab schedule

One day a week for five hours

| Week | 1 <sup>st</sup> ~2.5 h                                       | 2 <sup>nd</sup> ~2.5 h                          |
|------|--|---|
| 1    | <i>Exercise:</i> Introduction to R & multivariate statistics | Sample local ponds & examine plankton community |
| 2    | <i>Exercise:</i> Plankton community                          | Development of research project                 |
| 3    | <i>Exercise:</i> Secondary production                        | Research project analyses                       |
| 4    | <i>Exercise:</i> Lake models                                 | Presentations                                   |

### Overnight field trip

| Week                                       | Trip      |
|--|-----------|
| End of week two (Friday, Saturday, Sunday) | Stone Lab |

### Research Proposal milestones

| Week | Milestones  |
|------|---|
| 1    | Identify topic & approaches, oral brief presentation without slides           |
| 2    | One-page research proposal due on Monday, proposal peer reviews due on Friday |
| 3    | Research presentations on Friday  |
| 4    | Research proposal due on Friday   |

## Policies

**Citing and Plagiarism:** Very important: We assume that you know how to properly cite papers. If you do not know, you must come see us immediately. We must remind you that must always **paraphrase** the material you are citing, then include the citation. Paraphrasing does not mean copying and pasting information and then changing a few words. It means putting the words of one author into your own words for the start and then citing the author's name and date of publication at the end of the statement. Students are encouraged to talk to us during office hours. The earlier we face a problem, the more likely it is that we can provide you with helpful advice.

**Attendance:** Because this course is intensive and short, attendance will not be taken. Every class will be important for the student's ability to meet the course outcomes and your grade will be directly influenced by absences. If a student misses class activities, there will be no makeup opportunities unless you have provided a written notice from a medical doctor or (in the event of a university-sanctioned event such as athletics) a form from the athletics department. Forms must be submitted in advance of the exam. **Travel plans do not** count as an excuse for absence. You are fully responsible for all material missed in lecture and lab.

**Late Assignments:** **No late assignments**, without a previously approved medical or companionate excuse, will be accepted. You are fully responsible for meeting the assignment due dates. Information about any changes that were written on the board during laboratory sessions and lectures are part of your responsibility. This includes all changes and modifications of the syllabus that are distributed through e-mail or through Carmen.

**Statement on Academic Misconduct:** It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

**Statement on Diversity:** The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

**Statement on Disability Services:** The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: [slds@osu.edu](mailto:slds@osu.edu); 614-292-3307; [slds.osu.edu](http://slds.osu.edu); 098 Baker Hall, 113 W. 12th Avenue.

EEOB 5440 – Concurrence sought from:

School of Environment and Natural Resources

School of Earth Sciences