



# BIOL3024

## Fall 2014

Dr. Eric Maurer  
1306 Crosley Hall  
*eric.maurer@uc.edu*  
556-9706  
Office hours by appointment.

Dr. Ishi Buffam  
731H Rieveschl Hall  
*ishi.buffam@uc.edu*  
556-9745  
Office hours by appointment.

MWF 12:20-1:15 PM  
619 Swift Hall

### Course Themes

This course will examine the ecology of aquatic ecosystems. Focusing primarily on freshwater systems, the course will address their physical, chemical and biological properties, the origins and major characteristics of lakes and streams, and the distribution, ecology and adaptations of organisms living in aquatic systems. Key themes from freshwater ecology will be considered, including nutrient cycles, energy flow, and population, community and trophic dynamics, as well as the effects of anthropogenic disturbance on aquatic environments (such as habitat alteration, pollution, harmful algal blooms and climate change).

### Learning Outcomes

1. Design and carry out research to assess the most important physical, chemical and biological characteristics of a stream, river or lake.
2. Evaluate the health/status of a freshwater ecosystem using tools and concepts you learn in this class, and make educated recommendations about management action.
3. Explain the hydrologic cycle and communicate water resource issues at scales ranging from local to global.
4. Utilize "Systems thinking" to understand and explain how energy flow influences and interacts with organisms in their ecosystems, particularly in freshwater ecosystems.
5. Classify and identify freshwater algae, zooplankton, macroinvertebrates and fish found in the lakes, streams and rivers of this region. Explain the key ecological interactions among the biotic components of aquatic ecosystems.

### Course readings

Readings will come from the required textbook (below) and will be supplemented by materials from a variety of sources. Chapters for each topic are listed below and should be read prior to coming to class. Supplemental readings will be assigned periodically. **You are responsible for reading each day's assigned readings before coming to class.**

Textbook: Dodds, W. & M. Whiles. 2010. *Freshwater Ecology: Concepts & Environmental Applications of Limnology*, 2<sup>nd</sup> ed. Academic Press.

## Course Schedule

<i>Date</i>	<i>Topic</i>	<i>Readings</i>	<i>Who</i>
<b>Week 1</b>			
M 8/25	Introduction & Overview	Chapter 1	EFM
W 8/27	Aquatic Resources	Chapter 1	EFM
F 8/29	Aquatic Ecosystems in the News	Readings	EFM
<b>Week 2</b>			
M 9/1	<b><i>Labor Day - No Class</i></b>		
W 9/3	History & Properties of Water I	Chapters 2, 3	EFM
F 9/5	Properties of Water II	Chapters 2, 3	EFM
<b>Week 3</b>			
M 9/8	Aquatic Organisms - Life in the Water I	Chapter 8	EFM
W 9/10	Aquatic Organisms - Life in the Water II	TBA	EFM
F 9/12	Hydrologic cycles, Water balance & Watersheds	Chapter 4	IB
<b>Week 4</b>			
M 9/15	Streams & Rivers	Chapter 6	IB
W 9/17	Lake Origins & Morphometry	Chapter 7	EFM
F 9/19	Lake Morphometry & Biodiversity	Chapter 7	EFM
<b>Week 5</b>			
M 9/22	Aquatic ecosystems	Readings	EFM
W 9/24	Rift Lake Cichlids Case study	Readings	EFM
F 9/26	Microplankton, Algae & Aquatic Plants	Chapter 9	TBA
<b>Week 6</b>			
M 9/29	<b>MIDTERM EXAM 1</b>		
W 10/1	Aquatic Animals I	Chapter 10	EFM
F 10/3	Aquatic Animals II	Chapter 10	EFM
<b>Week 7</b>			
M 10/6	Fish diversity	Chapter 11	EFM
W 10/8	Aquatic Chemistry	Chapter 12	EFM
F 10/10	<b><i>Fall Reading Days – No Class</i></b>		
<b>Week 8</b>			
M 10/13	The Carbon Cycle	Chapter 13	IB
W 10/15	The Nitrogen Cycle	Chapter 14	IB
F 10/17	Oxygen, Primary Production and Stratification	Chapter 12	EFM
<b>Week 9</b>			
M 10/20	Water movements & Nutrient Limitation	Chapter 17	EFM
W 10/22	Eutrophication & Trophic State	Chapter 18	EFM
F 10/24	Killer Lakes	Readings	EFM

<b>Week 10</b>			
M 10/27	Approaches to Experiments	Chapter 24, Appendix	EFM
W 10/29	Population & Community Ecology I (phytoplankton-zooplankton)	Chapters 19, 20	EFM
F 10/31	Population & Community Ecology II (zooplankton competition)	Chapters 20, 21	EFM
<b>Week 11</b>			
M 11/3	Population & Community Ecology III (zooplankton & predation)	Chapters 19, 20	EFM
W 11/5	Population & Community Ecology IV (Fish)	Chapters 20, 23	EFM
F 11/7	<b>MIDTERM EXAM 2</b>		
<b>Week 12</b>			
M 11/10	Water Policy	Readings	EFM
W 11/12	Applied Aquatic Ecology: Indicators	Chapter 16, Readings	EFM
F 11/14	Trophic Webs & Cascades	Readings	EFM
<b>Week 13</b>			
M 11/17	Ecosystems I - Energy/Organic Matter Budgets	Chapter 24	IB
W 11/19	Ecosystems II – Energy/Organic Matter Budgets Part 2	Readings	IB
F 11/21	Ecosystems III - Stream Ecosystems and RCC	Chapter 24, Readings	IB
<b>Week 14</b>			
M 11/24	Ecosystems IV (cascades across systems, biodiversity-function)	Chapter 24, Readings	EFM
W 11/26	Ecosystems V (biodiversity-function, invasives)	Chapter 24, Readings	EFM
F 11/28	<b><i>Thanksgiving - No Class</i></b>		
<b>Week 15</b>			
M 12/1	Invasive species, and biodiversity	Readings	EFM
W 12/3	Arctic Limnology	Chapter 11, Readings	EFM
F 12/5	Climate Change & Freshwaters	Readings	EFM

---

**FINAL EXAMINATION    Monday, December 8, 1:30 - 3:30 p.m.**

## Additional Course Information: BIOL 3024

### Course Requirements & Grading

Grades in the course will be based on a variety of products- two midterm exams and a final exam (about 2/3 of total grade) and assignments & participation (about 1/3). The grading scale will be based on the standard scale:

Letter Grade	Percentage
A	89.5-100
B+	86.6-89.4
B	79.5-86.5
C+	76.6-79.4
C	69.5-76.5
D+	66.6-69.4
D	59.5-66.5
F	59.4 and below

**Class information and communications will be disseminated online through Blackboard.** It is your responsibility to stay informed of any Bb communications or assignments, and to download and read the required readings prior to the beginning of class.

**The work you will do in this course is subject to the University of Cincinnati Code of Conduct.** The Code of Conduct is a commitment to the highest degree of ethical integrity in academic conduct, a commitment that, individually and collectively, the students of the University of Cincinnati will not lie, cheat, or plagiarize to gain an academic advantage over fellow students or avoid academic requirements. While we will sometimes work in groups, you will prepare your assignments independently unless otherwise indicated by the instructor. If you are unsure about the rules for a particular assignment, it is your responsibility to ask the instructor.

**Special Needs Statement:** If you have any special needs related to your participation in this course – including identified visual, hearing or physical impairments, a communication disorder, and/or a specific learning disability that may influence your performance in this course – please contact me to arrange for reasonable provisions to ensure an equitable opportunity to meet all course requirements. Some accommodations may require prior approval by Disability Services (513-556-6823).