

LAKE ECOLOGY (BIOL G4463)

Fall 2020

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Meeting time& Place: Class will meet twice weekly on Mondays and Wednesdays from 11:00-11:50 in PHSC 122 (or by Zoom, depending on the COVID-19 situation) with the following exceptions: 07 Sep (Labor Day) and 25 Nov (Thanksgiving).

Other important dates to note: 12 Oct: Lecture Exam 1 is due; 16 Nov: Lecture Exam 2 is due; 16 Dec: Final Exam 3 is due.

Course Objective: To provide students with a broad overview of the field of lake ecology (or more broadly, limnology, the study of inland waters) via classroom discussions based on readings from the primary literature.

Course Goals:

- Help students develop an understanding and appreciation of lake ecosystems, focusing on major abiotic and biotic components and their ecological interactions
- Introduce students to the basic and applied ecology of lake ecosystems
- Introduce students to the key scientific approaches used to study and manage lake ecosystems
- Introduce students to major scientific papers in the fields of freshwater ecology and limnology

Text: Readings will be assigned from a variety of limnological texts and research journals and are posted in pdf form in Canvas for this course.

Grading policy:

Reading Outlines/Quizzes	10%	Exam 1	15%
Class Participation	15%	Exam 2	15%
Lab assignments/reports/project	30%	Exam 3	15%

Participation: Students will be expected to come to class prepared, having completed the assigned readings and assignments and to participate actively in classroom discussions. Classroom participation will constitute 20% of the course grade. Each day of lecture, students will be required to hand in a brief written summary or outline of the day's reading. Occasional quizzes will be given prior to selected lectures. These outlines and quizzes will constitute 20% of the course grade.

Use of technology in class is encouraged, particularly as it pertains to reducing the use of paper, and ultimately water. However, use of electronic social media (email, Facebook, etc.) during class will negatively affect your grade.

Graduate credit:

Lake Ecology (BIOL G4463) is approved for graduate credit. **If an undergraduate student wishes to receive graduate credit for the course, the student must declare so in the graduate college within the first two weeks of the semester.**

University Policies

Masking Statement

As outlined by the University of Oklahoma's Chief COVID Officer, until further notice, employees, students, and visitors of the OU community will be mandated to wear masks (1) when they are inside University facilities and vehicles and (2) when they are outdoors on campus and social distancing of at least six feet is not possible. For the well-being of the entire university community it is important that everyone demonstrate the appropriate health and safety behaviors outlined in the University Mandatory Masking Policy (<https://www.ou.edu/coronavirus/masking-policy>). As this mandate includes all campus classrooms, please make sure you are wearing your mask while in class. If you do not have a mask or forgot yours, see the professor for available masks. If you have an exemption from the Mandatory Masking Policy, please see the professor to make accommodations before class begins. If and where possible, please make your professor aware of your exemption and/or accommodation prior to arriving in class.

If a student is unable or unwilling to wear a mask and has not made an accommodation request through the Accessibility and Disability Resource Center (ADRC) (<https://www.ou.edu/drc>), they will be instructed to exit the classroom.

Copyright Statement for In-Person or Online Courses

Sessions of this course may be recorded or live-streamed. These recordings are the intellectual property of the individual faculty member and may not be shared or reproduced without the explicit, written consent of the faculty member. In addition, privacy rights of others such as students, guest lecturers, and providers of copyrighted material displayed in the recording may be of concern. Students may not share any course recordings with individuals not enrolled in the class or upload them to any other online environment.

Attendance Policy

A temporary university policy has been established to protect the OU community by ensuring that students who are ill or required to isolate feel encouraged to remain at home. Missing a class session or other class activity due to illness or isolation will not result in a penalty for the absence, and the student will not be asked to provide formal documentation from a healthcare provider to excuse the absence. This policy is based on all students and faculty adhering to the principles of integrity, honesty, and concern for others.

Students who are experiencing symptoms of COVID-19, including cough, fever, shortness of breath, muscle pain, headache, chills, sore throat, loss of taste or smell, congestion or runny nose, nausea or vomiting, or diarrhea or who have been in close contact with others who have symptoms should:

- Remain at home to protect others
- Ensure that any needed screening has been conducted (COVID-19 Screening and Reporting Tool) and any needed treatment obtained
- Contact the instructor prior to absence or inability to participate, if possible, and provide an honest report of the reason for which you cannot attend class or complete a course activity
- Continue to complete coursework to the extent possible, using Canvas, zoom, and other online tools
- Submit assignments electronically to the extent possible and as directed by the instructor
- Communicate with the instructor to arrange modifications to deadlines or work requirements or reschedule exams or other important course activities, when it is necessary

OU Reasonable Accommodation Policy:

The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with me as early in the semester as possible. Students with disabilities must be registered with the Accessibility and Disability Resource Center prior to receiving accommodations in this course. The Accessibility and Disability Resource Center is located in the University Community Center (730 College Ave.), 325-3852.

Academic misconduct:

I follow the University's policies on academic misconduct and I expect you to be familiar with these policies (<http://integrity.ou.edu>). Unless otherwise specified (group discussions/projects, for example), the work you turn in must be yours and yours alone. I expect you to provide citations of sources you use in all assignments. I will report any cases of cheating, plagiarism, and improper collaboration. Sanctions for academic misconduct can include expulsion from the University or an F in this course, so please take this seriously. If you have questions about properly citing sources, paraphrasing from those sources, or other aspects related to these issues please don't hesitate to contact me or the OU Writing Center. If you have questions about appropriate collaboration with group members, again, please ask me.

Religious observances:

It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays, without penalty.

Adjustments for Pregnancy/Childbirth Related Issues:

Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact your professor or the Disability Resource Center at 405/325-3852 as soon as possible. Also, see <http://www.ou.edu/eoo/faqs/pregnancy-faqs.html> for answers to commonly asked questions.

Title IX Resources and Reporting Requirement:

For any concerns regarding gender-based discrimination, sexual harassment, sexual assault, dating/domestic violence, or stalking, the University offers a variety of resources. To learn more or to report an incident, please contact the Sexual Misconduct Office at 405/325-2215 (8 to 5, M-F) or smo@ou.edu. Incidents can also be reported confidentially to OU Advocates at 405/615-0013 (phones are answered 24 hours a day, 7 days a week). Also, please be advised that a professor/GA/TA is required to report instances of sexual harassment, sexual assault, or discrimination to the Sexual Misconduct Office. Inquiries regarding non-discrimination policies can be directed to University Equal Opportunity Officer and Title IX Coordinator at 405/325-3546 or smo@ou.edu. For more information, visit <http://www.ou.edu/eoo.html>.

Emergency Protocol

During an emergency, there are official university [procedures](#) that will maximize your safety.

Severe Weather:

If you receive an OU Alert to seek refuge or hear a tornado siren that signals severe weather *1. LOOK* for severe weather refuge location maps located inside most OU buildings near the entrances *2. SEEK* refuge inside a building. Do not leave one building to seek shelter in another building that you deem safer. If outside, get into the nearest building. *3. GO* to the building's severe weather refuge location. If you do not know where that is, go to the lowest level possible and seek refuge in an innermost room. Avoid outside doors and windows. *4. GET IN, GET DOWN, COVER UP.* *5. WAIT* for official notice to resume normal activities.

[Link to Severe Weather Refuge Areas](#) , [Severe Weather Preparedness - Video](#)

Armed Subject/Campus Intruder:

If you receive an OU Alert to shelter-in-place due to an active shooter or armed intruder situation or you hear what you perceive to be gunshots:

1. GET OUT: If you believe you can get out of the area WITHOUT encountering the armed individual, move quickly towards the nearest building exit, move away from the building, and call 911. *2. HIDE OUT:* If you cannot flee, move to an area that can be locked or barricaded, turn off lights, silence devices, spread out, and formulate a plan of attack if the shooter enters the room. *3. TAKE OUT:* As a last resort fight to defend yourself.

For more information, visit <http://www.ou.edu/emergencypreparedness.html>
[Shots Fired on Campus Procedure - Video](#)

Fire Alarm/General Emergency:

If you receive an OU Alert that there is danger inside or near the building, or the fire alarm inside the building activates: 1. *LEAVE* the building. Do not use the elevators. 2. *KNOW* at least two building exits 3. *ASSIST* those that may need help 4. *PROCEED* to the emergency assembly area 5 *ONCE safely outside, NOTIFY first responders of anyone that may still be inside building due to mobility issues.* 6. *WAIT* for official notice before attempting to re-enter the building.

[OU Fire Safety on Campus](#)

Mental Health Support Services

If you are experiencing any mental health issues that are impacting your academic performance, counseling is available at the University Counseling Center (UCC). The Center is located on the second floor of the Goddard Health Center, at 620 Elm Rm. 201, Norman, OK 73019. To schedule an appointment call (405) 325-2911.

For more information please visit <http://www.ou.edu/ucc>.

Lake Ecology: Tentative Syllabus (subject to change)

Date	Day	Lecture Topic	Required Reading
24 Aug	M	1. Limnology: Introduction	
26 Aug	W	2. Origin of lakes I (lake formation & morphometry)	Cole and Weihe (2016), Ch 5
27 Aug	R	Lab 1: Microscopy of phytoplankton and zooplankton samples-I	
31 Aug	M	3. Origin of lakes II (lake formation & morphometry)	
02 Sep	W	4. Light, heat, and stratification	Cole and Weihe (2016), Ch 9–10
10 Sep	R	Lab 2: Lake stratification	Havel (2016); Lab 6
14 Sep	M	4b. Light, heat, and stratification (cont)	
16 Sep	W	5. Oxygen	Cole & Weihe (2016), Ch 12; Cornett & Rigler (1979)
17 Sep	R	Lab 3: Hypolimnetic oxygen deficits	
21 Sep	M	6. Nitrogen and Phosphorus	Cole & Weihe (2016), pp. 349-362;
23 Sep	W	7. Phytoplankton Diversity	Dodds and Whiles (2010) pp. 191-208
24 Sep	R	Lab 4: Limiting nutrients in algal growth experiment (design and data collection)	Lind Phytoplankton Enumeration
28 Sep	M	8. Nutrient Limitation	Schindler (1974), Elser et al. (1990)
30 Sep	W	9. Nutrients and predicting phytoplankton biomass	Dillon & Rigler (1974), McCauley et al. (1989)
01 Oct	R	Lab 5: Limiting nutrients in algal growth experiment (data analysis)	--
05 Oct	M	10. Nutrients and phytoplankton composition	Smith (1983), Downing et al. (2001)
05 Oct	M	Lecture Exam 1 Available (due 12 Oct)	
07 Oct	W	11. Zooplankton Diversity	Dodson (2005) – Chapter 4
8 Oct	R	Lab 6: Microscopy of phytoplankton and zooplankton samples-II	--
12 Oct	M	12. Zooplankton grazing and nutrient mineralization	Burns 1969, Hambright et al. (2007), Lurling 2020
14 Oct	W	13. Herbivorous zooplankton and phytoplankton	Mazumder & Havens (1998), Sommer et al. (2001)
15 Oct	R	Lab 7: Zooplankton grazing and life history experiment (design and data collection)	--
19 Oct	M	14. Predatory zooplankton	Gilbert (1966), Neill (1990)
21 Oct	W	15. Competition and predation in zooplankton: planktivorous fish	Brooks & Dodson (1965), Hurlbert et al. (1972)
22 Oct	R	Lab 8: Zooplankton grazing and life history experiment (data analysis)	--
26 Oct	M	16. Microbial consumers and the microbial loop	Carrick et al. (1991), Porter (1996), Hambright et al. (2007)
28 Oct	W	17. Top-down and bottom-up regulation of plankton	Mazumder (1994), Brett & Goldman (1997)
29 Oct	R	Lab 9: Vertebrate predation experiment (design and data collection) / Introduce Wikipedia Assignment	--
02 Nov	M	18. Piscivorous fish and trophic cascades	Zaret & Paine (1973), Carpenter et al. (1985), Drenner & Hambright (2002)
04 Nov	W	19. Biomanipulation of lake food webs	Drenner & Hambright (1999), TBA

05 Nov	R	Lab 10: Vertebrate predation experiment (data analysis) / Wikipedia training Due	--
09 Nov	M	20. Eutrophication & Lake Washington	Edmondson (1970)
09 Nov	M	Lecture Exam 2 available (due 16 Nov)	
11 Nov	W	21. The Water Crisis	Jackson et al. (2001), Rogers (2008)
12 Nov	R	Lab 11: WikiProject I – Choose your article/start writing	--
16 Nov	M	22. Hydro-engineering	Dynesius & Nilsson (1994), Rosenberg et al. (2000), Vörösmarty & Sahagian (2000)
18 Nov	W	23. Killer Lakes	Kling et al. (1987), Kling et al. (2005)
19 Nov	R	Lab 12: WikiProject II – Continue writing/add to an article	--
23 Nov	M	24. Harmful algal blooms: Cyanobacteria	Anderson et al. (2002), Paerl et al. (2016)
30 Nov	M	25. Harmful algal blooms: Golden algae	Hambright et al. (2010), Rimmel et al. (2011), Rimmel & Hambright (2012)
02 Dec	W	26. Invasive species/Zebra mussels	TBA
03 Dec	R	Lab 13: WikiProject III - Peer review articles	--
07 Dec	M	27. Paleolimnology/Resurrection ecology	TBA
09 Dec	W	29. History of limnology	Kalff (2002) – Chapter 2
09 Dec	W	Lecture Exam 3 (Final) available (due 16 Dec)	
10 Dec	R	Lab 15: WikiProject V – Finalize and submit article/Give presentation	
16 Dec	W	Lecture Exam 3 (Final) due	4:30-6:30 (312 SH)