BIOL 346 (CRN 10392)
Freshwater Ecosystems
2025 / Fall Term

INSTRUCTOR: Dr. Mark Louie D. Lopez (he/him)
Office: Petch 249
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LECTURES: Monday/Thursday 8:30am - 9:50 AM
Building and room: Cornett Wing B 135 (COR B135)

Delivery: Lectures will be delivered in-person. Whenever possible in-person lectures will be recorded using Echo360 to accommodate students who are not able to attend because of illness or other circumstances. If you have other questions or concerns regarding class recording and privacy, please contact privacyinfo@uvic.ca. The recordings will be posted in Brightspace. Some in class activities such as discussions or group exercises may not be recorded. Note that recording technologies can fail, and there is no guarantee that any lecture will be recorded successfully. In other words, do not rely on videos as your primary methods for attending class.

Communication: All course information including lectures PDFs will be posted on Brightspace. Please ensure that the email that use for Brightspace is the one you check most frequently. There is no textbook for this class. All course materials will be posted on Brightspace as needed.

OFFICE HOURS: Mondays 1:00 to 2:00 PM or email for appointment
Office: Cunningham 217

COURSE DESCRIPTION: This course provides a foundational understanding of the geological, physical, chemical, and biological processes that form and maintain lakes and riverine ecosystems. It covers theoretical and applied aspects of freshwater ecology and discusses studies and experiments that have been used to test important theories and applications. It also covers anthropogenic and environmental threats and impacts on freshwater ecosystems.

LEARNING OUTCOMES: By the end of this course, you will have a strong foundational understanding of the physical, chemical, and biological processes that shape lake and riverine ecosystems. You will be able to explain how lakes and rivers form geologically and how they undergo seasonal variation across space and time. You will also be equipped to evaluate how these systems respond to different human impact scenarios. You will develop quantitative skills by learning to calculate key metrics and indices commonly used in freshwater ecology. A key emphasis of the course is on integrative thinking, drawing connections between hydrology,

biogeochemistry, and ecological structure to make informed predictions about ecosystem dynamics, such as how river flow might influence freshwater community composition.

Specific learning outcomes:

- You will have better understanding and accurately use scientific terminology related to freshwater ecosystems.
- You will be able to analyze figures such as depth profiles, sediment layers, morphometric diagrams, hydrographs, and light transmission profiles to infer broader ecosystem characteristics.
- You will develop your quantitative acumen for aquatic ecosystems. You will learn how to calculate and interpolate various ecosystem metrics, and how to interpret them and relate them to hypotheses.
- You will learn how to develop hypotheses and predictions for ecosystem change in lakes and rivers based on foundational knowledge.
- You will be familiar with relevant policies shaping freshwater conservation in Canada including Fisheries Act, Canada Water Act, Canadian Environmental Protection Act (CEPA), and Species at Risk Act (SARA).

Expectations from the student enrolled in the course:

- Students are expected to have foundational knowledge on basic arithmetic, particularly metric conversions (distance and volume), logarithms, slopes, fractions, and ratios. They should also know how to calculate the area of simple shapes (e.g., circles, rectangles) and the volume of basic solids (e.g., spheres, cubes, cylinders). It is the student's responsibility to review these concepts as needed.
- Students should understand how to interpret different types of scientific figures, including x-y plots, bar charts, and box plots. This includes recognizing the difference between continuous and categorical data and identifying independent and dependent variables in graphs.
- Some course content may involve basic chemical concepts, such as moles and concentrations. Students are encouraged to review these topics when they arise in the course.
- Clear and coherent writing is required for all exams and assignments. If an answer is unclear or difficult to interpret, it may not be possible for the instructor to assign full marks.
- Students are expected to attend class regularly, stay up to date with course materials, and ask questions if anything is unclear.

LECTURE TOPICS: Topics that will be covered in this course include:

1. Lake morphology and geological origin
2. The water cycle of lakes and rivers

3. Nutrient cycles of lakes and rivers
4. Food webs of lakes and rivers
5. Human impacts including pollution and climate change
6. Ecology and management of lake and stream ecosystems

RECOMMENDED TEXTBOOKS AND REFERENCES: Course materials will be posted on Brightspace. For students seeking additional resources, the following recommended textbooks are available at the McPherson Library:

- Brönmark, C., & Hansson, L.-A. (2017). The biology of lakes and ponds (Third edition.). Oxford University Press.
- Hildrew, A. G., & Giller, P. S. (2023). The biology and ecology of streams and rivers. (Second edition / Alan Hildrew, Paul Giller.). Oxford University Press. https://doi.org/10.1093/oso/9780198516101.001.0001
- Ruttner, F., Frey, D. G., & Fry, F. E. J. (2020). Fundamentals of Limnology ([2d edition.). University of Toronto Press,. https://doi.org/10.3138/9781487573782

EVALUATION:

- **Weekly Brightspace quizzes (10%)** These multiple-choice quizzes are meant to help you keep track of the material. They are open book, untimed, and graded as a participation grade (meaning that you get full marks for completing the quiz). Quizzes will open on Thursdays (starting September 11) after class and will be available until Sunday at midnight. They will appear on the calendar portion of the Brightspace page. It is your responsibility to keep track of the quiz deadlines. **There are no make-up quizzes.**
- **Midterm 1 (25%) September 29th Monday**. First midterm will be held during class. This written in-person midterm will cover all lectures up to the date of the midterm. It will be a closed book exam, but students are allowed 1 double-sided sheet of handwritten notes (i.e. a "reference sheet").
- **Midterm 2 (25%) November 3rd Monday**. First midterm will be held during class. This written in-person midterm will cover all lectures between September 2nd and October 30th and might draw on some material from the first part of the class. The instructor will share more information closer to the date. It will be a closed book exam, but students are allowed 1 double-sided sheet of handwritten notes (i.e. a "reference sheet").
- **Final Exam (40%) December 8th Monday.** The final exam will be an in-person, cumulative, closed book exam, to be scheduled during the final exam period. Students will be allowed two double-sided sheets of handwritten notes (i.e. 4 pages of reference sheets total).

Grading scheme: A+ (90-100%), A (85-89.5%), A- (80-84.5%), B+ (77-79.5%), B (73-76.5%), B- (70-72.5%), C+ (65-69.5%), C (60-64.5%), D (50-59.5%), F (<50%, after final)

Students must attempt both midterms and the final for coursework to be considered complete. Otherwise, a grade of N will appear on the transcript.

Medical absences and missed exams: Medical documentation for short-term absences is not required (as approved by UVic Senate). If a student misses the midterm, a deferred midterm will be offered in the following week. If illness, accident, or family affliction causes a student to miss the final exam students are required to submit a request for academic concession, with associated documentation, as outlined in the UVic Calendar https://www.uvic.ca/calendar/dates/

A note on accessibility: If you are registered with the center for accessible learning (CAL, https://www.uvic.ca/services/cal/), or have any concerns about barriers to success, please discuss them with us as soon as you can.

NO CLASSES DURING READING BREAK

THE DEPARTMENT OF BIOLOGY DOES NOT OFFER SUPPLEMENTAL FINAL EXAMS

ADDITIONAL MATERIALS: UVic is committed to promoting, providing and protecting a supportive and safe learning and working environments for all its members.

Territorial Acknowledgement: *We acknowledge and respect the lək^{w}əŋən peoples on whose traditional territory the university stands and the Songhees, Esquimalt and W̱SÁNEĆ peoples whose historical relationships with the land continue to this day.*

University calendar: Important academic dates including add and drop dates can be found on the UVic website (https://www.uvic.ca/calendar/dates/)

Attendance and absences: *Medical documentation for short-term absences is **not required**. **Attendance is important**. Students who can not attend due to illness are asked to notify their instructors immediately. If illness, accident, or family affliction causes a student to miss the final exam or to fail to complete any assignment by the end of the term students are required to submit a request for academic concession.*
*Policies regarding undergraduate student academic concessions and deferrals are also detailed on the **Undergraduate Records**. Students must submit a submit a **Request for Academic Concession.***

Academic Integrity and Plagiarism: *Students are required to abide by all academic regulations set as set out in the University calendar, including standards of academic integrity. Violations of academic integrity (e.g. cheating and plagiarism) are considered serious and may result in significant penalties. (https://tinyurl.com/ycjeyumu)*

Copyright: *All course content and materials are made available by instructors for educational purposes and for the exclusive use of students registered in their class[1]. The material is protected under copyright law, even if not marked with a ©. Any further use or distribution of materials to others requires the written permission of the instructor, except under fair dealing or another exception in the Copyright Act. Violations may result in disciplinary action under the **Resolution of Non-Academic Misconduct Allegations policy (AC1300).***

Student conduct: *The University of Victoria is committed to promoting critical academic discourse while providing a respectful and supportive learning environment. All members of the university community have the right to this*

experience and the responsibility to help create such an environment. The University will not tolerate racism, sexualized violence, or any form of discrimination, bullying or harassment.
Please be advised that this includes logging into UVic's learning systems or interacting with online resources, and course-related communication platforms, you are engaging in a university activity.

All interactions within this environment are subject to the university expectations and policies. Any concerns about student conduct may be reviewed and responded to in accordance with the appropriate university policy.

To report concerns about online student conduct: onlineconduct@uvic.ca

Concerns about conduct in lectures and labs should be brought to your instructor.

Mental Health: *A note to remind you to take care of yourself. Diminished mental health can interfere with optimal academic performance. Do your best to engage in self-care and maintain a healthy lifestyle this semester. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle. You are not alone. Support services at UVic can be found through The UVic Student Wellness Centre which provides cost-free and confidential mental health services to help you manage personal challenges that impact your emotional or academic well-being.*