Course Overview

In this course we will build an understanding of how lakes, streams and rivers work. We will concurrently explore these systems in the context of humans, society and global environmental change.

**Systems science approach**
We will treat lakes, streams and rivers as dynamic and complex systems that can only be understood with an interdisciplinary approach. Therefore, we will concurrently explore their biology, chemistry, physics and geology. This “systems science” approach will provide the tools we need to understand how these freshwater bodies function and how they are impacted by environmental and anthropogenic change.

**Writing and communicating science**
As an introductory course, Lakes Streams and Rivers will aim to acquaint you with many of the canonical themes and concepts of limnology. Of equal importance will be the practice and development of writing skills. We will explore technical research articles and science communications for a broader audience. You will learn how these styles differ and what different purposes they serve. Throughout the semester you will critique and practice writing in these styles through diverse assignments and activities.

Course Resources:

**Website:**
https://moodle.macalester.edu/
Look here for:
- links to our remote classroom and breakout rooms
- Continuously updated course schedule
- Assignments, readings and announcements, forum

**Texts:**


A number of other readings will be assigned and posted on Moodle.
Course Goals

• Develop a basic understanding of the physics, chemistry, biology and geology of freshwater systems.

• Investigate how humans and society impact these systems.

• Communicate the science and history of freshwater systems through writing, speaking and visual presentation.

In other words, if you were to join a volunteer water quality monitoring group here in Saint Paul after taking this course, you would be able to understand what measurements are made and why. You could predict which systems are most anthropogenically impacted based on their characteristics and understand the historical context for their current environmental status. Importantly, you would be able to effectively communicate all of this information to community members in ways that are scientific, clear, concise and compelling.

Remote Course Format

Lakes, Streams and Rivers is adapted this year to be a remote course. This means our course community will exist entirely online. As your instructor I pledge to work rigorously and creatively to build an online community by:

• Giving the course a set weekly structure so that you will know what to expect and get used to the format
• Providing you with online labs, and group work that can be done through zoom breakout rooms
• Giving you different ways to engage with material and concepts, while reducing screen time where possible
• Taking class time to get to know each of you individually in the beginning of the Module

I also recognize that these times bring added stress, anxiety, and inequality to your college experience. I invite you to contact me about any of these issues. I will be flexible and help where I can.

A note on class materials

This course will not follow along with an assigned textbook. We will use the texts as needed and we will also read from other, research articles, books, and other resources. Ultimately, the material that you will be responsible for on exams will be covered in class. Therefore, attendance will be key to your success.
Assignments and Activities

- **Reading Responses (15-20%)** – A series of short (1-2 paragraph) responses to course readings. These should briefly summarize the reading and then describe in detail a concept or finding from the piece that you found interesting and learned from. Most reading responses will focus on “The Death and Life of the Great Lakes,” by Dan Egan (Credit/No Credit; five throughout module).

- **Group Checks (15-20%)** – In class worksheets focusing on core concepts, to be completed in groups during classtime. (Credit/No Credit; four throughout module).

- **Distributed Quizzess (15-20%)** – Short answer questions on course material covered in class. To be completed individually on Moodle. (Graded; three quizzes throughout the semester).

- **Perspective Paper (15-20%)** – A longer essay (5 pages, double-spaced) that summarizes, analyzes and critiques assigned peer-reviewed research articles. These assignments are to be written for a general audience. Grading will follow a rubric (to be handed out with assignment) that emphasizes scientific accuracy as well as writing style and technique (Graded).

- **Project (20%)** – Individual research project and presentation to be completed at the end of the module. The project will focus on a freshwater system of your choosing that has been impacted by humans. For the project you will reconstruct the undisturbed system, describe the history of disturbance and assess or recommend conservation/mitigation strategies (Graded; 10 minute pre-recorded presentation with slides, 5-10 peer-reviewed references).

- **In-class Lab Assignment (5%)** – A series of short answer questions based on lab activity. (Graded; one handout).

- **Participation (5%)** – Participation in synchronous activities, discussion forums, and group work.

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**Grade Scale:**

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<tr>
<th>Grade</th>
<th>Score Range</th>
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<tbody>
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<td>93-100</td>
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<tr>
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<td>90-92.9</td>
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<td>B+</td>
<td>87-89.9</td>
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<td>B</td>
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**Late Work:**
Credit/No credit assignments and the final project may not be turned in late. Perspective papers and lab assignments will be deducted by 5% of the determined grade for each day that they are late. Quizzes may not be missed unless there are documented extraordinary circumstances.

Everyone will be allowed one free extension on any type of assignment during the semester. To use this extension, please contact me at least 24 hours before the due date to make arrangements. In general, please communicate with me in advance if something arises that prevents you from completing your work.

**Incompletes:**
Incompletes will be considered only in the event of extraordinary circumstances. Please feel free to communicate with me and/or the Office of Student Affairs about circumstances you may be facing.
Academic Support and Course Policies

Equal opportunity for learning
I am committed to supporting the learning of all students in my class. This means fostering an inclusive learning environment and ensuring access to resources for all students. If you are encountering barriers to your learning that I can mitigate, please bring them to my attention. If you need disability related accommodations please contact the Disability Services office by emailing disabilityservices@macalester.edu, or by calling 651-696-6874 to schedule an appointment to discuss your individual needs.

Academic Integrity
From Macalester’s academic programs website: “Students are expected to maintain the highest standards of honesty in their college work; violations of academic integrity are serious offenses. Students found guilty of any form of academic dishonesty -- including, for instance, forgery, cheating, and plagiarism -- are subject to disciplinary action.” (www.macalester.edu/academicprograms/academicpolicies/academicintegrity/). While some of these issue are very clear cut, infractions involving plagiarism can be murky. Please see me if you are ever unsure of the integrity of your or a classmate’s work.

Names and Pronouns
All students in my class will have the right to be addressed in a manner suitable to them.

Digital Etiquette
In order to foster an inclusive environment, I ask that all students conduct themselves in our virtual classroom in a manner that is polite, respectful, and engaged. Please adhere to zoom-based policies covered at the beginning of the semester.

A note from your Professor

Hello and welcome to Lakes, Streams and Rivers!

I’m very excited to work with you this semester. I’ve been studying lakes for the past twelve years as a student, instructor and researcher. My PhD research was focused on Arctic lakes in northern Alaska. I continue to work in the Arctic and have recently also begun working on tropical river deltas in Indonesia.

My undergraduate training was in organic chemistry so I’ve always approached freshwater with a curiosity about what types of molecules are in the water, and what they might tell us about its environmental status and history.

Feel free to call me “Will” and please get in touch with any questions or feedback on the course or anything else. I can accommodate meetings outside of office hours. I look forward to working with you this fall!

Additional Resources

- Writing Center
  https://www.macalester.edu/max/writing/

- Earth Systems Science
  https://serc.carleton.edu/introgeo/earthsystem/nutshell/index.html