RIVER MANAGEMENT SPRING 2023

GEOG 357

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CLASS SCHEDULE

Section	Location	Time	Instructor(s)
GEOG 357 001 *[LEC]*	RCH 206	Mondays & Wednesdays 8:30 a.m. - 9:50 a.m.	Quinn Lewis quinn.lewis@uwaterloo.ca
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INSTRUCTOR / TA INFORMATION

Contact Information

Instructor: Dr. Quinn Lewis

Office: EV1-233 or remotely via Teams

Office Hours: M 1:00 MM – 2:00 PM EST and by appointment (in-person or online)

Email: quinn.lewis@uwaterloo.ca (mailto:quinn.lewis@uwaterloo.ca)

TA: Rachel Sun, l78sun@uwaterloo.ca (mailto:l78sun@uwaterloo.ca)

Office Hours : TBA

COURSE DESCRIPTION

Calendar Description for GEOG 357

Human society was born along the world's greatest rivers and we have depended on rivers for agriculture, drinking water, transportation, and recreation for millennia. However, we have also altered river form and function towards an 'unnatural' condition. This course analyzes the ways in which humans affect river systems, the physical and social mechanisms which complicate the relationship between humans and rivers, and how humans can restore rivers to a more natural state. This course also compares geomorphic, ecologic, and social functioning of rivers in pre- and post-alteration systems. The major theme of this course is navigating the delicate balance between allowing rivers to flow naturally and maintain ecologic functionality while simultaneously maintaining the river's ability to provide services of use to humans. What does human alteration of river systems mean for the current and future state of river

ecology, morphology, and hydrology? Can we find a way for rivers to provide functionality that satisfies the needs of both society and nature? This course provides students with the background and tools to take on these and other essential questions and challenges.

Prereq: Level at least 2B. Antireq: GEOG 374 041 S20, S21

LEARNING OUTCOMES

No explicit learning outcomes defined for this course.

This course will provide students with an understanding of river form and function. This course will build upon students' understanding of basic river process and form by providing background on differences between the ecological, morphological, and hydrological function of natural and impacted rivers. Students will read seminal literature on how humans alter rivers as well as the social aspects of river alteration and subsequent naturalization. Students will be able to critically assess potential impacts of straightening, damming, and polluting rivers on the environment, yet will also understand the complex and dynamic nature of attempts to restore and remove human impacts on rivers. An important component of this course is the completion of a river naturalization proposal in which students will formulate a plan to study or remediate a river or river system. Throughout this course, learning outcomes will focus on the themes of **theoretical background**, **natural vs. impacted** rivers, **naturalization strategies**, **finding a balance** between conservation and human modification, and **knowledge application**.

Specific learning outcomes are as follows:

1. Be able to critically explain the role of rivers in the environment and how human alteration of river systems can interrupt these critical ecological services.
   - For example, describe how rivers move water, sediment, nutrients, and pollutants through the environment in both natural and impacted river systems.
2. Analyze and synthesize data on river form and function, with a particular focus on rivers that are substantially impacted by humans.
   - For example, develop understanding of strategies to mitigate the harmful effects of river pollution and identify ways in which humans directly and indirectly alter river form.
3. Critically assess the past, present, and future of the social aspects of human use and modification of river systems.
   - For example, know and critically examine the diverse perspectives on river management by different stakeholders, including farmers, engineers, city planners, ecologists, and geographers.
4. Critically evaluate strategies for naturalizing rivers in a variety of environments.
   - For example, be able to predict how rivers might respond to naturalization by learning how and why case studies were successful or unsuccessful.

TENTATIVE COURSE SCHEDULE

Class Schedule (all times EST – Waterloo, Ontario time)

Week	Topic	Reading Material*	Lecture Activity**	Key Themes
1 Begins May 8	Introduction: what is river naturalization?	The science and practice of river restoration, Wohl et al., 2014	Class introduction, setting expectations, and Q and A	**background**
2 May 15	Basic river functions: the role of the river	Choose your own paper to read from given candidate papers	Whitemans Creek Project Discussion	**background**
3 May 22	Basic river functions: ecology and morphology	Standards for ecologically successful river restoration, Palmer et al., 2005		**background**
4 May 29	Natural vs. impacted: what do humans do to rivers?	The human role in changing river channels, Gregory, 2005	Exploration Activity 1 Assigned	**natural vs. impacted**
5 June 5	Natural vs. impacted: what is the result of human modification of rivers?	Bank Erosion as a Desirable Attribute of Rivers, Florsheim et al., 2008	Week of Whitemans Creek Visit 1	**natural vs. impacted**
6 June 12	Naturalization strategies: physical processes	TBA/NONE	Mid-term exam (on material from week 1-5)	**naturalization strategies**
7 June 19	Naturalization strategies: social processes	Stream restoration and the surprisingly social dynamics of science, Lave, 2016	Project Progress Report Due	**naturalization strategies**
8 June 26	Finding a balance: what makes naturalization successful?	River restoration, habitat heterogeneity and biodiversity: a failure of theory or practice?, Palmer et al., 2010	Exploration Activity 1 Due	**finding a balance**

9 July 3	Finding a balance: diverse stakeholders	"The river is us; the river is in our veins": re-defining river restoration in three Indigenous communities, Fox et al., 2017	Week of Whitemans Creek Visit 2	**finding a balance**
10 July 10	Outreach and science communication	TBA/NONE	Exploration Activity 2 Assigned	**knowledge application**
11 July 17	Naturalization in the Anthropocene	Damming the rivers of the Amazon basin, Latrubesse et al., 2017 AND River plastic emissions to the world's oceans, Lebreton et al., 2017 (don't worry, they are both short!)		**knowledge application**
12 July 24	Conclusion: what is river naturalization?	TBA/NONE	Exploration Activity 2 Due Final Project due August 1	**knowledge application**

Final Examination Period begins August 4 and ends August 19. Final Examination schedule released June 2. Final and Midterm Exams will be online. Go here (https://uwaterloo.ca/registrar/important-dates/calendar) **for important dates.**

TEXTS / MATERIALS

No materials required.

There is no required textbook for this course; readings on specific topics listed in the lecture schedule will be provided to students. Students are expected to read all of the assigned material.

There is no defined grading scheme for this course.

Assessment

Exploration Activities (10%)

Mid-term Assessment (20%)

Final Assessment (open book/"take home") (25%)

River Naturalization Project at Whitemans Creek (**45% total**)

      Progress Report (15%)

      Final Project (30%)

Late work: Work between 0 and 2 days late will be assessed a 15% penalty. Work between 2 and 5 days late will be assessed a 30% penalty. Work over 5 days late will be assessed a 50% penalty. Late work will not be accepted after more than 3 weeks past due date.

Example – you submit an assignment 3 days late, and your grade is 30/30 (100%). You have an adjusted grade of 100*(30/30)*0.7 = 70%. You submit an assignment18 hours late and your grade is 25/30 (83%). You have an adjusted grade of 100*(25/30)*.85 = 70.8%.

ASSIGNMENT SCREENING

Turnitin.com: Text matching software may be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. Students' submissions are stored on a U.S. server, therefore students must be given an alternative (annotated bibliography), if they are concerned about their privacy and/or security. Students will be given due notice, in the first week of the term and/or at the time assignment details are provided, about arrangements and alternatives for the use of Turnitin in this course. The alternative to using this software is to prepare an annotated bibliography for each assignment. For advice on how to prepare an annotated bibliography, see: https://guides.library.cornell.edu/annotatedbibliography.

NEW: ChatGPT and AI: Our instructional team is intelligent and technological enough to understand when cheating with the help of AI is probable. We reserve the right to use tools to confirm the use of AI on assignments. AI can be a useful study tool, but we consider pasting anything from an AI tool directly into an assignment as cheating. Plus, you won't do well on the exams if you cheat your way through labs or expect AI to answer the exam questions.

NOTICE OF RECORDING

Recording lecture
Use of recording devices during lectures is only allowed with explicit permission of the instructor of the course. If allowed, video recordings may only include images of the instructor and not fellow classmates. Posting of videos or links to the video to any website, including but not limited to social media sites such as: facebook, twitter, etc., is strictly prohibited.

ADMINISTRATIVE POLICY

Mental Health: The University of Waterloo, the Faculty of Environment and our Departments/Schools consider students' well-being to be extremely important. We recognize that throughout the term students may face health challenges - physical and / or emotional. **Please note that help is available**. Mental health is a serious issue for everyone and can affect your ability to do your best work. Counselling Services https://uwaterloo.ca/campus-wellness/ (https://uwaterloo.ca/campus-wellness/) is an inclusive, non-judgmental, and confidential space for anyone to seek support. They offer confidential counselling for a variety of areas including anxiety, stress management, depression, grief, substance use, sexuality, relationship issues, and much more.

All students are encouraged to download the WatSAFE app which is available free through the google and iOS app stores. The WatSAFE app provides on- and off-campus contacts for students in distress, including international students, and other information related to campus safety and security.

Religious Observances: Students need to inform the instructor at the beginning of term if special accommodation needs to be made for religious observances that are not otherwise accounted for in the scheduling of classes and assignments.

Communications with Instructor and Teaching Assistants: All communication with students must be through either the student's University of Waterloo email account or via LEARN. If a student emails the instructor or TA from a personal account they will be requested to resend the email using their personal University of Waterloo email account.

Recording lecture: Use of recording devices during lectures is only allowed with explicit permission of the instructor of the course. If allowed, video recordings may only include images of the instructor and not fellow classmates. Posting of videos or links to the video to any website, including but not limited to social media sites such as: facebook, twitter, etc., is strictly prohibited.

UNIVERSITY POLICY

Academic integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check the Office of Academic Integrity (https://uwaterloo.ca/academic-integrity/) for more information.]

Grievance: A student who believes that a decision affecting some aspect of their university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4 (https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70) . When in doubt, please be certain to contact the department's administrative assistant who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for their actions. [Check the Office of Academic Integrity (https://uwaterloo.ca/academic-integrity/) for more information.] A student who is unsure whether an action

constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline (https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-71) . For typical penalties, check Guidelines for the Assessment of Penalties (https://uwaterloo.ca/secretariat/guidelines/guidelines-assessment-penalties) .

Appeals: A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70) (other than a petition) or Policy 71, Student Discipline (https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-71) may be appealed if there is a ground. A student who believes they have a ground for an appeal should refer to Policy 72, Student Appeals (https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-72) .

Note for students with disabilities: AccessAbility Services (https://uwaterloo.ca/accessability-services/) , located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

Turnitin.com: Text matching software (Turnitin®) may be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. Students' submissions are stored on a U.S. server, therefore students must be given an alternative (e.g., scaffolded assignment or annotated bibliography), if they are concerned about their privacy and/or security. Students will be given due notice, in the first week of the term and/or at the time assignment details are provided, about arrangements and alternatives for the use of Turnitin in this course.

It is the responsibility of the student to notify the instructor if they, in the first week of term or at the time assignment details are provided, wish to submit alternate assignment.