RENR250 / RRMT239

Water Resources Management/ Freshwater Ecosystems and Hydrology

In Fall 2025, RRMT 239, Freshwater Ecosystems and Hydrology (part of Renewable Resources Management Program), is being offered at Yukon University concurrent with the University of Alberta's RENR 250, Water Resources Management as part of the Northern Environmental and Conservation Sciences, B.Sc. Program. All students registered in RRMT 239 or RENR 250 must adhere to requirements outlined in this course syllabus. University of Alberta students must also be aware of, and adhere to, the University's Code of Student Behaviour, referenced in this outline; Yukon University students must be aware of, and adhere to, Yukon University's Academic Regulations, also referenced here.

INSTRUCTOR: Darrell Otto; Instructor, Renewable Resources Management

OFFICE HOURS: TBA

OFFICE LOCATION: **A2303**

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CLASS DAYS & TIMES: Mon. and Wed. 9:00 – 10:20am

CLASS LOCATION: A2210

LABORATORY DAYS AND TIMES: Fri. 1:00 – 3:50pm

LABORATORY LOCATION: A2805

COURSE DESCRIPTION

This is a two-component course intended to teach students habitat assessment techniques for freshwater ecosystems, as well as the basic elements of hydrology. Applied aspects of limnology are emphasized. In the hydrology section of the course students study how water is distributed, moved, and stored on a global scale followed by the study of processes at small scale.

COURSE REQUIREMENTS

For students taking the course as RRMT 239:
Prerequisite(s): Second year standing in Renewable Resources Management; BIOL 101. RRMT 125 recommended, but not essential.

For students taking the course as RENR 250:
Prerequisite(s): Registration in Yukon University/University of Alberta B.Sc. in Environmental and Conservation Sciences degree program.

EQUIVALENCY OR TRANSFERABILITY

Receiving institutions determine course transferability. Find further information at: https://www.yukonu.ca/admissions/transfer-credit.

Students in the B.Sc. ENCS program should contact an ENCS advisor if they have questions about equivalency or transferability of this course.

LEARNING OUTCOMES

On successful completion of this course students will:

· Clearly understand freshwater systems as environment.

· Recognize the diversity of freshwater organisms, their respective trophic levels, and interactions.

· Understand population dynamics, community ecology, energy flow and chemical cycles existing in freshwater ecosystems.

· Have the basic skills necessary to assess freshwater habitats

· Understand fundamental hydrologic principles including water distribution and pathways, mechanisms of water movement, measurement of precipitation and water flow, the watershed as a unit for study and management of water-related processes including erosion, solution, transport, and deposition.

· Recognize the role of water as a shaper of landscapes and as an essential component of ecosystems.

COURSE FORMAT

Weekly breakdown of instructional hours

It is expected that this course will require 3 hours of lecture and 3 hours of lab/week. It is expected that this course will require 6 hours/week of homework and additional reading. It is important to note that the time required will vary by individual.

Delivery format

The mode of delivery for this course includes two 1.5-hour face-to-face classroom lectures per week as indicated above. Additionally, there will be a series of laboratory/fieldwork sessions intended to reinforce lecture materials. These laboratory sessions will include traditional laboratory work as well as case studies, site visits and field-based exercises.

The laboratory component of this course is mandatory. There will be an emphasis on the applied aspects of fieldwork and data collection in conjunction with sample analysis and specimen identification techniques to be completed in the laboratory. Most of the fieldwork will be conducted in the water over the first eight weeks of the course, as weather permits. Fieldwork sessions may be physically demanding, and appropriate clothing is necessary. **Successful completion of the lab component is required to gain credit for this course**. This means you must attend the labs and receive a passing grade on the combined laboratory reports (40%) as well as being successful in the lecture components (60%) to pass the course.

EVALUATION

The course grade will be determined as follows:

For students enrolled in the course as either RRMT 239 or RENR 250:

	Percent
Mid-term exam	15
Major Assignment/Essay	20
Lab Reports	40
Final Exam	25
Total	**100%**

Attendance and Participation

Attendance at both the lecture and laboratory sessions is mandatory.

Assignments and Due Dates

A series of laboratory reports are mandatory. These are to be written in scientific format, unless other instructions are given. Laboratory reports are due at midnight, two weeks (14 days) after the laboratory session. Instructions for the lab reports will be in the handout provided at the beginning of the lab session and on the course (Moodle) webpage.

A major written assignment/term paper related to freshwater ecology or hydrology will be required (20%). You are expected to research and write a **substantial paper** of a recommended 10-12 pages of text on a topic that falls within the scope of the course and has been pre-approved by the instructor. The due date for your major written assignment is November 17, 2025. It is strongly recommended that you submit a one paragraph outline of your intended topic by October 15, 2025, to ensure your term paper subject matter is relevant to the course.

Laboratory reports and the term paper will be accepted for a maximum of 5 days after the due date, but the grade will be reduced by 10% per day.

You are expected to complete your own term paper and laboratory assignments. **Collaborations are not permitted** unless prior arrangements are made with the instructor.

Plagiarism

Plagiarism is a serious academic offence. Plagiarism occurs when students present the words of someone else as their own. Plagiarism can be the deliberate use of a whole piece of another person's writing, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material. Whenever the words, research or ideas of others are directly quoted or paraphrased, they must be documented according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Resubmitting a paper which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the College.

Exams

The lecture portion of the course will be evaluated by an in-class midterm examination (15%) of 80 min. duration during normal lecture time on Wednesday October 15, 2025. A 3-hour final exam (25%) as scheduled during the examination period on Friday December 19 at 1300h.

Assignment of grades

Midterm and final exam grades will be weighted to reflect the appropriate fraction of the total course grade, as will the laboratory reports. The term paper will be given a letter grade which will be pro-rated to a fraction of 20. Laboratory assignments will be given a maximum grade - usually ranging from 10 to 25 total marks - reflecting the expected content of the assignment. The final course grade will be expressed on Yukon University's letter grading system (see below).

Letter Grade	Percent Grade
A+	95-100
A	86-94
A-	80-85
B+	75-79
B	70-74
B-	65-69
C+	62-64
C	58-61
C-	55-57
D	50-54
F	<50

COURSE WITHDRAWAL INFORMATION

Students registered in *RRMT 239* should refer to the YukonU website for important dates.

Students registered in *RENR 250* should refer to the UAlberta calendar for important dates (calendar.ualberta.ca)

TEXTBOOKS AND LEARNING MATERIALS

There is no assigned textbook for this course. Extensive study notes will be provided on the course website and additional readings provided as either paper copies, library reserve items or internet links.

The following textbook is relevant to this course and can be used to reinforce learning materials or for reference purposes. A copy is on reserve at the library for you to use on a short term (24 hour) loan.

***Wetzel, R.G. Limnology: Lake and River Ecosystems. 3rd Ed. Academic Press San Diego California. 2002.**

*Wetzel's book is intended for an advanced course of study (usually 4th year level) but is very comprehensive and considered a primary source for all freshwater ecology and limnology students.

COURSE WEBSITE

We will be using Yukon University's Moodle system which will be discussed in the introductory lecture. All course materials will be made available on the course website.

ACADEMIC INTEGRITY

Yukon University Academic Standards and Regulations

Students are expected to contribute toward a positive and supportive environment and are required to conduct themselves in a responsible manner. Academic misconduct includes all forms of academic dishonesty such as cheating, plagiarism, fabrication, fraud, deceit, using the work of others without their permission, aiding other students in committing academic offences, misrepresenting academic assignments prepared by others as one's own, or any other forms of academic dishonesty including falsification of any information on any Yukon University document.

Please refer to YukonU Academic Regulations & Procedures for further details about academic standing and student rights and responsibilities.

University of Alberta Academic Integrity and Code of Student Behaviour

The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at www.governance.ualberta.ca) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

All students at the University of Alberta are subject to the Code of Student Behaviour, as outlined at: http://www.governance.ualberta.ca/en/CodesofConductandResidenceCommunityStandards/CodeofStudentBehaviour.aspx Please familiarize yourself with it and ensure that you do not participate in any inappropriate behavior as defined by the Code. Key components of the code include the following statements.

30.3.2(1) No Student shall submit the words, ideas, images or data of another person as the student's own in any academic writing, essay, thesis, project, assignment, presentation or poster in a course or program of study.

30.3.2(2) c. No Student shall represent another's substantial editorial or compositional assistance on an assignment as the student's own work.

PROFESSIONALISM AND CLASSROOM RULES OF ENGAGEMENT

Students are expected to attend all lectures and labs, be engaged and courteous in all course activities, and to be on time for class. Please do not use cellular phones during class. Laptops are permitted for note taking and in-class work; however, please do not use laptops in class for non-class-related activities. While in computer labs, students are expected to refrain from using the computers to engage in non-class-related activities

RECORDING OF LECTURES, LABS, ETC.

Audio or video recording, digital or otherwise, of lectures, labs, seminars, or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s).

Please note that some classes may be recorded using web conferencing software, and links to recordings may be posted on the class website.

ACCESSIBILITY AND ACADEMIC ACCOMMODATION

Yukon University is committed to providing a positive, supportive, and barrier-free academic environment for all its students. Students experiencing barriers to full participation due to a visible or hidden disability (including hearing, vision, mobility, learning disability, mental health, chronic or temporary medical condition), should contact Accessibility Services (https://www.yukonu.ca/student-life/learning-matters/accessibility-services) for resources or to arrange academic accommodations: access@yukonu.ca.

TOPIC OUTLINE

Proposed Lecture Series 2025

Lecture #	Lecture Topic
1	Course Introduction
2	Water as Substance/Water as Environment
3	Water as Environment
4	Single-celled and Colonial Organisms
5	Rotifers, Annelids and Arthropods
6	Larger Aquatic Organisms
7	Populations Dynamics (changes over time)
8	Species Interactions and Community Structure
9	Community Ecology I
10	Community Ecology II
11	Midterm Exam
12	Community Ecology III
13	Aquatic Ecosystems I -Energy Flow
14	Aquatic Ecosystems II – Productivity
15	Aquatic Ecosystems III – Physiological Ecology
16	Chemical Cycles I – Carbon and Oxygen
17	Chemical Cycles II – Nitrogen and Phosphorous
18	Chemical Cycles III – Silicon and Toxins
19	Water in Landscapes
20	Lake Origins