Yukon University

COURSE OUTLINE

RRMT 239
FRESHWATER ECOSYSTEMS AND HYDROLOGY

(3)

PREPARED BY: Darrell Otto, Instructor
DATE: September 1, 2022

APPROVED BY: Name, Title
DATE: Click or tap to enter a date

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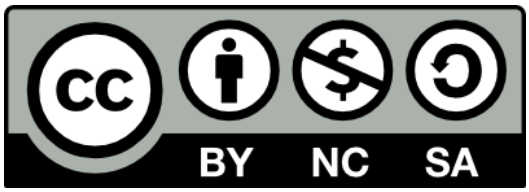
APPLIED SCIENCE DIVISION
RRMT 239
COURSE OUTLINE
SEPTEMBER 2022



APPLIED SCIENCE DIVISION

RENEWABLE RESOURCES MANAGEMENT 239
FRESHWATER ECOSYSTEMS AND HYDROLOGY (3)

Instructor Darrell Otto
Office A2303

Telephone 668-8868
Email dotto@yukonu.ca

Lectures: Mon. & Wed. 1030 – 1200h
Room A2601

Lab Thurs. 1300-1600h
Room A2805

COURSE DESCRIPTION

This is a two-component course intended to teach habitat assessment techniques for freshwater ecosystems; as well as basic elements of hydrology. The freshwater ecology portion of the course will emphasize the applied aspects of limnology. Laboratory sessions will focus on the collection of data relevant to the physical, chemical, and biological variables that influence living organisms and their interactions within these systems. Topics covered include an overview of freshwater as environment, freshwater flora and fauna, population dynamics, community ecology, energy, and chemical cycles. The hydrology portion of the course will study how water is distributed, moved, and stored on a global scale, followed by a study of processes at smaller scale including precipitation, accumulation, surface and groundwater flow of water and ice together with the associated solution, erosion, transport and sedimentation actions. The course will also look at the conservation and protection of water as a resource for people, and as an essential environmental component.

LEARNING OUTCOMES

On successful completion of this course students will:

- Have a clear understanding of freshwater systems as an environment
- Recognize the diversity of aquatic organisms, their respective trophic levels, and interactions.
- Understand population dynamics, community ecology, energy flow and chemical cycles existing in freshwater systems.
- Have the basic skills necessary to assess freshwater habitats
- Understand fundamental hydrologic principles including the distribution of water and the pathways and mechanisms of water movement, measurement of precipitation and water flow, the watershed as a unit for study and management, 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

Detailed notes will be provided to students via the course website on Moodle. Lectures will be face-to-face format, at a pace of two (2) 85-minute lectures per week. A laboratory exercise of 3 hours duration, intended to reinforce course lecture topics, will be held weekly unless otherwise noted.

The laboratory component to 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 fieldwork will be conducted in or on the water over the first eight weeks of the course, as weather permits. Lab 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 an overall passing grade on the laboratory reports (30%) , in addition to being successful on the lecture components to pass the course.

A major written assignment/term paper related to freshwater ecology or hydrology will be required for successful completion of the course.

PREREQUISITES

Second year standing in Renewable Resources Management; BIOL 101 or RRMT 121 are course prerequisites. RRMT 125 and RRMT 149 are recommended, but not essential.

COURSE TRANSFER

This course is accepted for transfer as credit for Renewable Resources 250 – RENR 250 Water Resource Management - at University of Alberta.

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.

ACADEMIC ACCOMMODATION

Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon College Academic Regulations (available on the Yukon College website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, he/she should contact the Learning Assistance Centre (LAC) at (867) 668-8785 or lassist@yukonu.ca.

YUKON FIRST NATIONS CORE COMPETENCY

Yukon University recognizes that a greater understanding and awareness of Yukon First Nations history, culture and journey towards self-determination will help to build positive relationships among all Yukon citizens. As a result, to graduate from ANY Yukon University program, you will be required to achieve core competency in knowledge of Yukon First Nations. For details, please see www.yukonu.ca/yfnccr.

ACADEMIC AND STUDENT CONDUCT

Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/ Admissions & Registration web page.

REFERENCE TEXTS:

The following textbook is relevant to this course and can be used to reinforce learning materials. A copy is on reserve at the library for you to use short term.

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

*Wetzel's book is intended for a more advanced class (usually 4th year level), but it is very comprehensive and considered a primary source for Freshwater Ecology and Limnology students.

Additional reading materials will be supplied or placed on reserve in the library.

EVALUATION

The lecture portion of the course will be evaluated by an in-class midterm examination of no more than 80 min. duration on October 17, 2022 during normal lecture time, and a 3-hour final exam set in the examination period on December ??, 2022 at ???0h.

The major assignment/term paper mark will be based on a final report and presentation of your findings.

Marks will be assigned as follows:

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

RRM 239/RENR 250 – Freshwater Ecosystems/Hydrology
Proposed Lecture Series – 2022

Lecture #	Lecture Topics
1	Course Introduction
2	Water as Substance/Water as Environment
3	Water as Environment
4	Single Celled and Colonial Organism
5	Rotifers, Annelids and Arthropods
6	Larger Aquatic Organisms
7	Population 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 – Energy Flow
14	Aquatic Ecosystems – Productivity
15	Aquatic Ecosystems – Physiological Ecology
16	Chemical Cycles I – Carbon and Oxygen
17	Chemical Cycles II – Nitrogen and Phosphorus
18	Chemical Cycles III – Silicon and Toxins
19	Water in Landscapes
20	Lake Origins
21	
22	

*****A total of 28 lecture periods are available in the semester, but allowances are made for the fact that some lectures will overrun their allotted time due to volume of content.

RRM239/RENR250

Proposed Lab Sessions for Fall 2022

Week of:	Description	Location
Sept. 12	Lab #1 – Pond Life - Algae and Rotifers	Pond/Lab
Sept. 19	Lab#2 – Lake Stratification	Fox Lake
Sept. 26	Lab#3- Zooplankton Identification and Density	Biology Lab
Oct. 3	Lab#4 - Overwintering Stream Invertebrates as Bioindicators	McIntyre Creek/ Biology Lab
Oct. 10	Thanksgiving	
Oct. 17	Lab #5 – Small Stream Fish Habitat Assessment	Wolf Creek
Oct. 17	Lab #6 – Sewage Lagoon Visit	Livingston Trail
Oct. 24	Lab #7 – Stream Discharge	McIntyre Creek
Oct. 31	Lab #8 – Icy Waters Case History	Biology Lab
Nov. 7	Lab #8 – Sewage Treatment	Biology Lab
Nov. 14	Lab #9 - Constructed Wetlands as Filters	Biology Lab
Nov. 21	Lab #10 – Biological Oxygen Demand	Biology Lab
Nov. 28	Lab #11 – Watershed Drainage Patterns	Biology Lab
Dec. 5	Lab# 12 -	

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