
We acknowledge with great respect that The University of Manitoba campuses are located on original lands of Anishinaabeg, Cree, Oji-Cree, Dakota, and Dene peoples, and on the homeland of the Metis Nation.

AGEC 2370 - Principles of Ecology
Faculty of Agricultural and Food Sciences
Fall 2022

Instructor:

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Office hours:

By appointment

Course Description: The course will cover, at a basic level, ecologically important aspects of the environment and interactions between the environment and organisms and between organisms contained therein, factors that influence the dynamics of populations, the effect of interactions on populations and communities, characteristics of ecosystems, cycles of energy and materials within ecosystems, and how ecological data is acquired, processed and interpreted.

Description in Aurora: AGECE 2370 - Principles of Ecology (Lab required) Principles of ecology at the individual, population, community, and ecosystem levels. May not be held with BIOL 2300 or BIOL 2301 or BIOL 2390. Prerequisite: BIOL 1030 (BIOL 1031) or BIOE 2590.

Lectures: T (Tuesday) and R (Thursday), 1:00-2:15 pm, Room 260 - Helen Glass Centre

Laboratories: T or W or F, 2:30-5:25 PM, Room 203 – Animal Science/Entomology Building

Synchronous Labs begin September 20 – attend the section in which you are registered! (see detailed lab schedule)

Instructional Methods

This course combines lectures, field data collection, laboratory work, analysis and interpretation of ecological data, in class discussions, and written assignments (laboratory reports).

Course Philosophy

Course goals:

- Demonstrate knowledge of basic principles of ecology including population growth, ecological interactions, succession, and evolutionary change
- Evaluate current global threats to the environment caused by food production demand, habitat loss, overpopulation, pollution, resource consumption, and climate change
- Understand principles of scientific research applied to ecological questions

Expected learning outcomes:

- Apply ecological theories to explain patterns observed in biological systems
- Devise potential solutions for ecological problems using scientific reasoning and ecological principles
- Understand basic data collection and management in ecological studies
- Understand the design, execution, and analysis of ecological experiments with testable hypotheses
- Search, find, and utilize current literature in ecological journals to augment discussion of ecological studies conducted in class

- Produce reports of ecological studies in a clear, precise, and succinct way.

I Expect you to...

approach this course with academic integrity, take responsibility for your actions and honor your academic commitments. Regular attendance to lectures and labs is essential for success in this course. You are encouraged to ask for assistance whenever you feel it is necessary. You should treat your fellow students with respect and foster a cooperative learning environment where other's ideas are heard and discussed.

You can expect from me...

to be available to help you understand course concepts, materials, and assignments. I value your ideas and I will encourage questions and answers to develop them. I do not expect perfection in your answers during class or laboratory discussions, they are meant to foster critical thinking and develop your own understanding of the concepts.

I view the diversity that the students bring to class as a strength and benefit to all. I will strive to present materials and activities that are respectful of diversity: gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture. It is my intent that students from all diverse backgrounds and perspectives benefit from this course by embracing a diverse learning environment. Your suggestions about how to improve any aspects of the course are encouraged and appreciated. (adopted and modified from <https://www.brown.edu/heridan/teaching-learning-resources/inclusive-teaching/statements>)

Required Textbook: Bowman, WD and SD Hacker. 2020. Ecology, 5th edition. Oxford University Press. 594 pp. (previous editions and similar books also work fine; check also ebook rental costs for more affordable options)

Letter Grade Equivalency:

A+ = >90%; A=80-89%; B+ =75-79%; B=70-74%; C+=65-69%; C=60-64%; D=50-59%; F=<50%.

Course Evaluation:

Mid Term Test (75 min) 20%

Laboratory Data and Reports 36%

Participation/Completing Pop Quizzes (marks not based on score) 10%

Final Examination (2 hrs.) 34%

Attendance and Participation: Active participation in lectures and labs will be used to assess class participation. Attendance to laboratories is required to receive lab report marks. Class participation is an essential part of this course.

Schedule for Examinations:

- **Mid-term** Tuesday, October 25, 2022, 1:00 – 2:15 pm in Room 260 – Helen Glass Centre
- **Final Exam** scheduled by the Registrar's Office.

Note: To pass the course, students must complete **all four** items below:

- a) obtain an **overall passing mark** in the course
 - b) pass the **Academic Integrity Quiz**
 - c) write the **midterm** exam and the **final exam**
 - d) obtain a passing grade (**50%**) **on the lab report portion.**
- Late lab reports are subject to a deduction of 10% for each day late.
 - The final exam is cumulative and will include up to 20% of the material previously tested in the midterm exam.

- If the mid-term exam is missed for a verifiable and accepted reason (e.g. Medical emergency), with prior written approval from the instructor, the marks allocated for the mid-term exam will be added to the total for the final examination (which is cumulative).

Important Dates <http://umanitoba.ca/student/records/deadlines/>

First day of course	Sept 8, 2022
National Day of Truth and Reconciliation (U closed)	Sept 30, 2022
Thanksgiving Day (U closed)	Oct 10, 2022
Fall Term Break/Remembrance Day.....	Nov. 7 – 11, 2022
Voluntary withdrawal date (VW)	Nov 22, 2022*
Final day of course	Dec 8, 2022
Exam period.....	Dec 13 – 23, 2022

* Grades for the midterm and laboratory reports 1-3 will be available before the Voluntary withdrawal date.

UM Learn (<https://universityofmanitoba.desire2learn.com/d2l/login>): Course materials (i.e. lecture notes, laboratory handouts, etc.) will be uploaded to UM Learn, it is your responsibility to learn how to access this page.

Class Communication: You are required to obtain and **use your U of M email account** for all communication between yourself and the university. The University requires all students to activate an official University email account. For full details of the Electronic Communication with Students please visit:

[http://umanitoba.ca/admin/governance/media/Electronic Communication with Students Policy - 2013 09 01 RF.pdf](http://umanitoba.ca/admin/governance/media/Electronic_Communication_with_Students_Policy_-_2013_09_01_RF.pdf).

Please note that all communication between you as a student and myself must comply with the electronic communication with student policy.

Important: in all your communications by email (to the instructor or TAs), please include in the subject line **AGEC 2370, lab day, group number (example: AGEC 2370-Tue-3, request to meet)** to ensure a timely response. I will make an effort to reply to emails within 48 hours. However, questions about information that is in the syllabus, announced during lectures or labs, or can be found in handouts on UML may result in a delayed response.

Lecture notes and other written documents: Lecture notes and other materials will be posted as pdf files on UML. The purpose of the notes is to facilitate keeping up with presentation of class material; notes are not a substitute for class attendance. Notes will usually be posted shortly before the day of the class. The lecture schedule indicates the chapter in the text book that is associated with each topic. Students should read the chapter concerned at about the time the topic is being presented in class. The lectures will highlight important material from the chapter, but supporting information in the chapter will assist with understanding.

Lecture Outline

Introduction to Ecology

What is ecology?	Chapter 1
Adaptation, evolution & experimental design	Chapter 1

The Physical Environment

Climate	Chapter 2
The Biosphere	Chapter 3
Temperature and water variation	Chapter 4
Energy variation	Chapter 5

Populations

Evolution and Ecology	Chapter 6
Life history	Chapter 7
Behavioral Ecology	Chapter 8
Distribution and abundance	Chapter 9

Life tables, population growth and regulation	Chapter 10
Population dynamics	Chapter 11
Population Interactions	
Competition	Chapter 12
Predation	Chapter 13
Parasitism	Chapter 14
Mutualism	Chapter 15
Communities	
Community characteristics	Chapter 16
Succession	Chapter 17
Biogeography	Chapter 18
Species diversity and richness	Chapter 19
Ecosystems	
Production	Chapter 20
Energy flow and food webs	Chapter 21
Nutrient cycling	Chapter 22
Landscape ecology	Chapter 24
Conservation biology	Chapter 23

Note: Tentative schedule subject to modification. Chapters in the textbook cover some topics in more or less detail than will be discussed in lectures, although reading the entire chapter is helpful and those students who do so tend to have a better understanding of the material and do better on exams. **Testing will be based on material, verbal or written, presented in class and in lab.**

Recording of Classes: Alejandro Costamagna and the University of Manitoba hold copyright over the course materials, presentations and lectures, which form part of this course. No audio or video recording of lectures or presentations is allowed in any format without Alejandro Costamagna's permission. Course materials, including lab reports, both paper and digital, are for the participant's private study and research only and are not to be shared by any media or posted online.

Academic Integrity

Plagiarism or any other form of cheating in assignments, examinations, term tests or any academic work is subject to serious academic penalty. Cheating in examinations or tests may take the form of copying from another student or bringing unauthorized materials into the exam room. Exam cheating can also include exam impersonation. A student found guilty of contributing to cheating in examinations or term assignments is also subject to serious academic penalty. Electronic detection tools may be used to screen assignments in cases of suspected plagiarism. You should acquaint yourself with the University's policy on plagiarism, cheating, and examination impersonation as detailed in the General Academic Regulations and Policy section of the University of Manitoba Undergraduate Calendar. Visit http://umanitoba.ca/student/resource/student_advocacy/ and <http://umanitoba.ca/student-supports/academic-supports/academic-integrity> for more information.

Laboratory Information

Laboratory Objectives:

- To provide experience with techniques for measuring a range of ecological variables
- To provide exposure to the problems associated with measuring ecological variables
- To illustrate selected ecological principles
- To introduce the process of scientific research and the primary literature generated

Lab handouts: There is no lab manual. Information for each lab will be available on-line and **should be read in advance to the lab**. The general instructions for lab reports are in the **“Laboratory Report Format Handout”**.

Working Groups: Students will work in groups of 4-5. All group members must attend and participate in labs. If there is a problem with any particular member not co-operating then feel free to contact the teaching assistant or

the instructor. Students will be randomly assigned to a group during the first lab and you will remain in the same group of students throughout the term.

You will need to keep a record of who is in your group and their contact information. **Please record your group number and your lab day on all written work.**

Laboratory Exercises: There will be six exercises (*see lab schedule*). All six lab exercises must be written up and submitted for grading. Keep a copy of all material submitted. Although you will carry out the exercises in groups, each student will submit an individual report. Each student is responsible for obtaining all the relevant data from other group members. To that end, students should be sure that they know how to contact their lab partners outside of class time. For some exercises, the data for the entire section or entire class may be pooled.

Laboratory Preparation: Before each laboratory, read the appropriate sections of the textbook. Then read the handout describing the exercise to be sure that you know what is expected of you and that you are ready at the beginning of the lab period to ask questions about anything you need clarified. The introductory lab talk will not go through all the information already available in the handout, so be sure you have **read through the exercise and watch instructional videos (if available) before your lab period.**

Laboratory Reports: A report for each exercise must be written up **by each student**. Keep a copy of all material submitted. The due dates for each report may be found in the attached lab schedule and are typically one week after the completion of all data collection for an exercise. Lab reports will normally take 10-14 days to mark, and once reports have been handed back, no other late reports will be accepted. **There will be lab questions on the midterm and final exam.**

See the “Laboratory Report Format Handout” and individual “lab handouts” for more details on each lab activity and associated lab report.

Laboratory Schedule

Week	Lab	Topic	Lab report due	%
13-16-Sep-22		Academic integrity quiz (NO LAB)		
20-23-Sep-22	1	Dandelions	Quiz Passed*	
27-30-Sep-22		NO LAB (National Truth and Reconciliation Day)		
04-07-Oct-22	2	Trees & Shrubs / Human life tables introduction	Dandelions	4.1
11-14-Oct-22	3	Aquatic invertebrates Competition I (plant seeds)		
18-21-Oct-22	4	Human Life Tables II (data compilation and analysis) Aquatic Invertebrates II	Trees & Shrubs	4.1
25-28-Oct-22	5	Mark-Recapture	Aquatic invertebrates	5.3
01-04-Nov-22		NO LAB	Human life tables	7.5
08-11-Nov-22		Remembrance Day/Fall Break (NO LAB)		
15-18-Nov-22	6	Competition II	Mark-Recapture	7.5
22-25-Nov-22		NO LAB	Competition	7.5
			<i>Total grade %</i>	<i>36</i>

*Lab reports will not be accepted until the Academic integrity quiz is passed.

For general University and Faculty regulations and Resources for students please refer to **Schedule A: Student Resources and Support** available at the course UML site.