

BIO4405G and BIO9412G

Ecosystem Ecology

Dr. Irena Creed

Course Outline

2012

COURSE INSTRUCTOR:

Instructor: Professor Irena Creed
Office: Biology and Geology Building (B&G) Room 3023
Office hours: 1 hour immediately following lecture *or* by arrangement
Voice-mail: 519-661-4265 (84265)
Personal E-mail: icreed@uwo.ca
Course E-mail: bio4405.2012@gmail.com (please use this one!)
Teaching Assistant: (Lily) Xue Du (xdu8@uwo.ca)
Office hours: TBA
Teaching Assistant: Brian Sutton-Quaid (bsutton@uwo.ca)
Office hours: TBA

COURSE INFORMATION:

Structure:

Lecture: Tuesday and Thursday, 10:30 to 11:30 in Western Science Centre 240
Laboratory: Friday, 9:30 to 12:30 in Kresge Building K-103

Prerequisites:

Biology 2483a Ecology

The Senate regulation with respect to your responsibility for ensuring that course prerequisites have been completed successfully states: "Unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment of your fees in the event that you are dropped from a course for failing to have the necessary prerequisites."

COURSE SYLLABUS:

Description:

This course introduces students to the science of ecosystem ecology. Ecosystem ecology is a young, inherently multidisciplinary science. Over the 21st century, major advances in ecosystem ecology were driven by the emergence of environmental problems. For example, in the 1960s, the response of ecosystems to biomagnifications of pesticides and eutrophication of waters from excess nutrients led to the formation of the discipline of ecosystem ecology. Over the next couple of decades, ecosystem ecology became integrated with physical and chemical sciences. By the end of the 21st century, recognition of the fundamental role that humans play in all ecological problems led to the integration of ecosystem ecology with social sciences. This course examines the concept of ecosystem ecology; the factors that influence ecosystem structure and function; the processes that determine the flow of energy and water and the cycling of carbon and nutrients in ecosystems; the role of disturbance on these processes; and the integrated effects of these processes at landscape scales and their consequences for sustainable use by human societies. **Lectures** will focus on the fundamental principles of ecosystem ecology. **Laboratories** will focus on application of these fundamental principles to ecosystem science being conducted by Canadian ecosystem scientists that are designed to improve our understanding of how humans impact ecosystems.

Calendar Description:

This course traces the flow of water, energy and nutrients from their abiotic origins, to their cycles through microbes, plants, and animals. The course will synthesize current advances in ecology with established theory to offer a comprehensive survey of ecosystem pattern and process.

Course Evaluation:

This course is designated as an essay course. Students will prepare three reflection papers (500 words each), which must be delivered to the Instructor's office by the deadline indicated below. Both hardcopies and softcopies must be submitted.

30%	Reflections (3 x 10%)
20%	Mid-term Exam
40%	Final Exam
10%	Participation (Individual and Group)

Instead of the reflection papers, graduate students registered in Bio9412G will be required to complete an independent project that must receive approval by the Instructor.

Reflections (30%):

The reflection papers will be focused on historical accounts of how *"a cadre of influential scientists have clouded public understanding of scientific facts to advance a political and economic agenda"*. These reflection papers will be informed from a film, a special guest speaker, a selected chapter in the course book "Merchants of Doubt" plus 3-5 additional readings chosen by the student. Guidelines for how to prepare a successful reflection paper (including a rubric) will be provided during the first week of class. Hardcopies must be delivered to Irena's office by the deadline. Softcopies (for "turnitin" analysis) must be submitted to the course gmail account by the deadline.

Reflection papers are due January 23, March 5, April 5.

There will be a 10% late penalty each day (including weekends).

Exams (60%):

The two exams – a **mid-term (20%)** and **end of term (40%)** – will include a combination of short-answer and long-answer questions drawn from theories and techniques presented in both the lectures and the laboratories.

Participation (10%, individual and group):

Participation is fundamental to the learning environment.

Attendance in class activities is mandatory.

An individual participation grade will be awarded based on your attendance, readiness, and discussion during class activities.

A group participation grade will be awarded for your introduction of one of the guest speakers. The introduction will be supported by: (a) a journal article on the topic to be placed on course website; (b) a biography of the guest speaker; and (c) a two page summary of the topic that will be distributed to the class. On the day that the guest speaker presents, your group will be responsible for introducing the guest speaker, leading (and/or stimulating!) the Question/Answer (Q/A) period; and taking the guest speaker to lunch (the Instructor will cover cost of lunch for guest speaker only).

Both the Instructor and the Teaching Assistants will determine this 10%.

COURSE RESOURCES:

Web Site:

Course updates and lecture and laboratory resources (i.e., presentations, readings) will be available online through WebCT Owl (<http://webct.uwo.ca> or <https://owl.uwo.ca/webct/logon/419323261051>) as PowerPoint files and/or PDF files. The login user name and password are the same as your UWO email. Please check this page on a weekly basis for course updates.

Blog Site:

Another way to participate in the course is through the course blog site – just check the “discussion” tab on WebCT Owl.

Required Textbooks:

1. Chapin, F.S. III, P.A. Matson, P.M. Vitousek. 2011. Principles of Terrestrial Ecosystem Ecology. Springer-Verlag, NY.
2. Oreskes, N., E. Conway. 2010. Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming. Bloomsbury Press, NY.

The required books are available in the bookstore. Alternatively, the books are available on reserve at the Taylor Library or they can be reserved online through the UWO library catalogue. All reserves are for 1 day.

COURSE POLICIES:

Late Penalties:

A penalty of 10% per day (including weekends) will be deducted from the assigned grade for late submissions. Once reflection papers are graded and returned, a grade of 0 will be assigned.

Academic Offences:

Scholastic offences are taken seriously and you are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web Site:

<http://www.uwo.ca/univsec/handbook/appeals/scholoff.pdf>.

The reflection papers will be subject for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

Use of Electronic Devices:

No electronic devices will be allowed during the examinations.

Illnesses:

The University recognizes that a student's ability to meet his/her academic responsibilities may, on occasion, be impaired by medical illness. Academic accommodation for work representing 10% or more of the student's overall grade in the course shall be granted only in those cases where there is documentation indicating that the student was seriously affected by illness and could not reasonably be expected to meet his/her academic responsibilities. Documentation shall be submitted, as soon as possible, to the appropriate Dean's office (the Office of the Dean of the student's Faculty of registration/home Faculty) together with a request for relief specifying the nature of the accommodation being requested. Once the petition and supporting documents have been received and assessed, appropriate academic accommodation shall be determined by the Dean's Office in consultation with the student's instructor(s).

COURSE SCHEDULE: TBA on first day of class.

Depending on special opportunities that may arise over the semester and student choices this plan may change.

Winter 2010 Bio4405 and Bio9412 Course Calendar

Week Starting	Tuesday	Thursday	Friday	Action
1 Jan-09	The Ecosystem Concept	The Ecosystem Concept	Laboratory philosophy and schedule	Chapter 1 Readings [1, 2]
2 Jan-16	Earth's Climate System	Earth's Climate System	FILM/SPEAKER CHAPTER/REFLECTION	Chapter 2
3 Jan-23	Water and Energy Balance	Water and Energy Balance	TBA	Chapter 4
4 Jan-30	Carbon Input to Ecosystems	Carbon Input to Ecosystems	TBA	Chapter 5
5 Feb-06	Carbon Budgets - Plant	Carbon Budgets - Plants	TBA	Chapter 6
5 Feb-13	Carbon Budgets - Ecosystems	Carbon Budgets - Ecosystems	TBA	Chapter 7
6 Feb-20	Reading week	Reading week	Reading week	
7 Feb-27	Review	Mid-term	FILM/SPEAKER CHAPTER/REFLECTION	Mid-Term
9 Mar-05	Nutrient Use	Nutrient Use	TBA	Chapter 8
10 Mar-12	Nutrient Cycling	Nutrient Cycling	TBA	Chapter 9
11 Mar-19	Trophic Dynamics	Trophic Dynamics	TBA	Chapter 10
12 Mar-26	Change in the Earth System	Change in the Earth System	FILM/SPEAKER CHAPTER/REFLECTION	Chapter 14
13 Apr-02	Managing and Sustaining Ecosystems	Managing and Sustaining Ecosystems	Good Friday	Chapter 15
14 Apr-09	Review	Classes end		

[1] Pace, M.L., P.M. Groffman. 1998. Needs and concerns in ecosystem science. p. 1-6. in "Successes, Limitations and Frontiers in Ecosystem Science. Springer-Verlag, NY. Inc.

[2] Carpenter, S.R. 1998. The need for large-scale experiments to assess and predict the response of ecosystems to perturbation. Section heading "Learning about Ecosystems Requires Multiple Approaches". p. 288-291. in "Successes, Limitations and Frontiers in Ecosystem Science. Springer-Verlag, NY. Inc.