 COURSE INSTRUCTOR:

Instructor: Dr. Gabor Sass (gabor.sass@uwo.ca)
Office: Collip Building, Room 209
Office hours: 1 hour immediately following lecture or by arrangement

Teaching Assistants: Eric Enanga (eenanga@uwo.ca)
Aleksey Paltsev (apaltsev@uwo.ca)

COURSE INFORMATION:

Structure:
Lecture: Tuesday and Thursday 10:30 to 11:30 in B&G - 0153
Laboratory: Friday 09:30 to 12:30 in B&G - 0153

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

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:

Detailed 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.

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 by ecosystem scientists in academic and non-academic (e.g. consultancy) settings to investigate and solve pressing ecological problems of the day. In addition we will also look at different ways of communicating the latest science findings to other scientists, policy and other decision makers, as well as to the public.
**Course Evaluation:**

- 20% Book review
- 15% Individual Presentation
- 15% Attendance & Participation
- 15% Mid-term Exam
- 35% Final Exam

**Book review (20%):**
This course is designated as an essay course. Your writing assignment will be based on the **critical reading, analysis and reflection** on a recently published book “Merchants of Doubt” which investigates the historical accounts of how “a cadre of influential scientists have clouded public understanding of scientific facts to advance a political and economic agenda”. In essence you will have to prepare a book review and it will consist of two major components: summary and analysis.

You can think of the **summary** as a book report, an objective discussion of the content of the book (2000-2500 words). The summary will be due on March 4th. The **analysis** which you can think of as a critical book review that you might find written up for any book will require you to pass judgment on the book, would you recommend it for someone else to read? Why or why not? Rather than being descriptive, this writing will be analytical and persuasive (1000-1500 words). The analysis will be due on April 8th. Guidelines for how to prepare a successful book review (including a rubric) will be provided during the first week of class. In addition to paper copies, also please send a digital copy to the TA (for “turnitin” analysis). There will be a 10% late penalty each day (including weekends).

**Individual presentation (15%):**
Wherever life will take you, most likely you will have to speak in public whether as a scientist, manager, policy maker, politician, or engaged citizen. In this component of the course (which hopefully will turn out to be lots of fun as well) you will assume a role of scientist, journalist, consultant, or watershed manager. As part of your chosen role, you will be analyzing an already published scientific article or report, and preparing a TED-like presentation to get your point across the clearest way possible. The presentation will be 12-15 minutes followed by a 5 minute discussion period. Make sure you prepare for a lively Question/Answer (Q&A) period after your presentation. To prepare your classmates, you will have to write a summary of your talk in advance of the tutorial as well as start a discussion forum on the OWL site after the talk.

**Attendance & Participation (15%):**
Participation is a fundamental part of the learning environment. You will need to be present in all lectures and laboratories as well as be ready to participate actively in the communal learning. An individual participation grade will be awarded based on your attendance, readiness, and discussion during class activities and on-line discussion forums. Students will be expected to check and comment on the class on-line forum on a weekly basis.

**Exams (50%):**
The two exams -- a **mid-term (15%)** and **end-of-term (35%)** -- will include a combination of short-answer and long-answer questions drawn from theories and techniques presented in both the lectures and the laboratories. We will have reviews before both exams. The mid-term will be written in-class (1 hour long) whereas the final exam will be written during the regular end-of-term examination period (3 hour long).
COURSE RESOURCES:

OWL Site:
Course updates and lecture and laboratory resources (i.e., presentations, some readings) will be available online through OWL [https://owl.uwo.ca/portal] 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. Another way to participate in the course is through the course on-line forum. Students will be expected to check and comment on the on-line forum on a weekly basis.

Required Textbooks:

Recommended Textbooks:

COURSE POLICIES:

Late Penalties:
A penalty of 10% per day (including weekends) will be deducted from the assigned grade for late submissions.

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 book reviews 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).
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<thead>
<tr>
<th>Week Starting</th>
<th>Tuesday</th>
<th>Thursday</th>
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<tr>
<td>1 Jan-06</td>
<td>Introduction</td>
<td>The Ecosystem Concept</td>
<td>Laboratory philosophy and schedule; Writing book reviews; FILM</td>
<td>Chapin - Ch 1 Papers [1, 2, 3] Oreskes – Intro, Ch 1</td>
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<tr>
<td>2 Jan-13</td>
<td>Earth’s Climate System</td>
<td>Earth’s Climate System</td>
<td>River walk: Ecosystem science in the winter</td>
<td>Chapin - Ch 2 Oreskes - Ch 6</td>
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<td>3 Jan-20</td>
<td>Water and Energy Balance</td>
<td>Water and Energy Balance</td>
<td>Science in the News Guest: Jason Winders</td>
<td>Chapin - Ch 4</td>
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<td>4 Jan-27</td>
<td>Carbon Input to Ecosystems</td>
<td>Carbon Input to Ecosystems</td>
<td>Science at the UN (Climate change, water, ecosystem health) Guest: TBA</td>
<td>Chapin - Ch 5 Oreskes - Ch 3</td>
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<td>5 Feb-03</td>
<td>Carbon Budgets - Plants</td>
<td>Carbon Budgets - Plants</td>
<td>Science Symposium (Terrestrial ecosystems) Guest: Dr. Zoe Lindo</td>
<td>Chapin - Ch 6</td>
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<tr>
<td>5 Feb-10</td>
<td>Carbon Budgets – Ecosystems</td>
<td>Carbon Budgets – Ecosystems</td>
<td>Science Symposium (Aquatic ecosystems) Guest: TBA</td>
<td>Chapin - Ch 7 Oreskes - Ch 7</td>
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<td>6 Feb-17</td>
<td>Reading week</td>
<td>Reading week</td>
<td>Reading week</td>
<td>Oreskes – Concl. Epilogue</td>
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<td>7 Feb-24</td>
<td>Review</td>
<td>Mid-term Exam (In-class)</td>
<td>FILM</td>
<td>Mid-Term</td>
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<tr>
<td>9 Mar-03</td>
<td>Nutrient Use</td>
<td>Nutrient Cycling</td>
<td>Science Symposium (Ecosystem interfaces) Guest: Eric Enanga</td>
<td>Chapin - Ch 8, 9</td>
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<td>10 Mar-10</td>
<td>Trophic Dynamics</td>
<td>Trophic Dynamics</td>
<td>Science Symposium (Urban ecosystems) Guest: TBA</td>
<td>Chapin - Ch 10</td>
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<td>11 Mar-17</td>
<td>Temporal Dynamics</td>
<td>Landscape Heterogeneity</td>
<td>Environmental assessment (Consultant meeting) Dr. Gabor Sass</td>
<td>Chapin - Ch 12, 13</td>
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<td>12 Mar-24</td>
<td>Change in the Earth System</td>
<td>Change in the Earth System</td>
<td>Watershed planning (Stakeholder meeting) Guest: TBA</td>
<td>Chapin - Ch 14</td>
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<td>13 Mar-31</td>
<td>Managing and Sustaining Ecosystems</td>
<td>Managing and Sustaining Ecosystems</td>
<td>Merchants of Doubt Guest: TBA</td>
<td>Chapin - Ch 15</td>
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<td>14 Apr-07</td>
<td>Review</td>
<td>NO CLASS</td>
<td>NO TUTORIAL</td>
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