

Biology 4230a: Ecosystem Health

2015–16 Course Outline

Instructor Information:

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Office hours: Tuesdays and Thursdays after class, or by appointment.

Course Description

Above all, this course is about your future. If you are interested in understanding the global projections for the next 50 years and trying to understand where your career may provide opportunities for you to make a difference, then this course is for you. We will be looking at two aspects of ecosystem health: will look at the health of the global ecosystem and we will look at case studies on the practical nature of running and ecosystem health project. With this understanding, we will generate an idea of the general changes and give you a framework of how decisions are made in a more specific ecosystem health project.

At the center of this course are two phenomena: 1st, there are great changes in the population numbers of the earth, and 2nd, there are increasing demands of the population on what many believe to be the limited capacity of the earth, measured as ecological services. Population changes and increased demands on the capacity of our earth are altering terrestrial and marine ecosystems on a global scale for the first time in history. These changes may already be having serious effects on ecological and human health, and there is growing concern that in the coming decades the effects could be dramatic.

This course was developed to explore the relationship between ecological and human health and the environment, a relationship that is rarely addressed in current science, medical sciences or environmental science curriculum. The aim of this course is to *ensure that the student is ecologically literate in the discussion of health issues and global environmental change.*

The course will provide an overview of the basic important parameters used to explain global environmental change, and of the potential consequences of these changes on ecological and human health. After introductory lectures in the concepts and applications of “ecosystem health,” we will consider bio-assessment parameters for ecological and human health and then follow a series of case studies where the lecture material provides the background and then students present and discuss individual case studies. Global scale topics include: global climate change, the effects of toxic substance pollution on global ecosystems, the demands on terrestrial and marine environments, the loss of species

and biodiversity and the growing demands on our drinking water. The role of rapidly growing human populations and resource consumption, and of the human domination of the earth's biological productivity, in the genesis of environmental change will be examined.

This course is experimental in that students will be expected to tackle new and different problems through a combination of readings, individual research, team plans and discussion and class presentation exercises. Through our discussions we will create a transdisciplinary intellectual environment. Some topics have been chosen to allow us to reflect on past problems and others are problems anticipated for your generation.

IF YOU DON'T READ ANYTHING ELSE, PLEASE READ THIS:

I am trying to do something different in this course. I was motivated to change teaching styles after a review of undergraduate teaching at Harvard College a few years ago. I believe that you need a chance to be **intellectually creative**. I believe that we need to talk together about ideas, not be told ideas. Not just to learn to jump some hoop called the final exam. In the usual "talking head" class, this is not possible. So there is limited enrollment in this course so that we can try new approaches.

"New" sometimes brings "uncertainty" to students. I don't think that is an issue in this course. It is a very participatory course and you are expected to be in class, ready to contribute. The format is very close to that of a graduate student class so your preparation is BEFORE class, not in time for the exam. My experience suggests that this works very well and I welcome you to join me in this adventure.

The Missing Link is New Transdiscipline Ideas. Also note that I am oddly obsessed that all Western Science students are prepared for the next step in their professional life. Certainly one of the untested tasks in our science students is effective critical discussion of transdiscipline ideas. Now this often scares away students because it not their strength – but it's not mine either. I would like to use the class to building on our application of science through improved reading and analysis and effective writing/presentations. If you are good at this, then excellent! If you are not so good at this, then this is the place for you! A quote I have stolen from Judith Swan (Princeton University Writing Program): *"Success in science takes as much skill with language as it does working in the laboratory."*

There are a couple points during the term when I will be away. Please don't take this as a lack of passion for you and your education. It is a hazard of my research life and I hope that my research allows me to bring new ideas into the daily classroom. (So there is a benefit of being away.) Please accept this, as it is – a chance to reflect and get caught up on course work or a chance to hear the subject from a new source. I will ensure that you get value for the whole course, missed classes and all.

Learning Outcomes

By the end of this course you will be able to:

1. Engage in critical thinking and writing about the core questions that underlie scholarship in the field of Ecosystem Health;
2. Review and critique socioecological determinants of health, with an emphasis on those that lead to human illness or community health issues;
3. Develop the tools to assess and implement the principles of both Planetary and Ecosystem Health

Course Materials and Design

Course Website

Students should check OWL (<http://owl.uwo.ca>) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. Students are responsible for checking OWL on a regular basis.

Course Materials

There is no suitable textbook for this course. Instead there will be pre-class readings to ensure that we have a lively and intellectual discussion. Thus the format of the class is that of a “flipped classroom”. It is fully anticipated that readings will be done prior to class.

Anticipated Lecture Topics

Please see the file named “2016_Bio4230_schedule” available on OWL.

Evaluation

Unlike mathematics, this is not a course of “right vs. wrong” (2+2 will always equal 5). However, it is based on the interpretation of facts. Sometime the facts are “good,” sometimes not so good.

Sometimes the “facts” change. Sometimes judgments have to be made in order to understand topics. These are all aspects of complex sciences. This doesn’t mean that assessments of performance cannot be made.

How to assess your performance?

- Regardless of what you choose to do in life the ability to stand before a group and make an argument – and to argue persuasively - will serve you well.
- Learn to read the primary literature.
- Assess the strengths and weaknesses of different approaches to the science of ecosystem health.
- Similarly, effective writing will strengthen your ability to obtain any future position you wish.
- Quantitative analysis and reasoning are essential. Active global citizens must be comfortable with interpreting data and quantitative arguments.

So ... We make assessments based on **performance** in several different aspects of the course.

Individual Performance (55%):

Class contribution (15%), attendance (10%), exam (30%).

Group Performance (45%):

Case study: presentation and discussion (35%), webcast/podcast/video (10%).

ASSESSMENT:

1. Contribution in discussion (15%). *“Bring something to the table, don’t just talk”*

*In this type of course, you are expected to contribute to the collective learning of the class. In order to do so, you must prepare the readings carefully. During class, you must listen actively to the class conversation, ask questions of your classmates, offer insights, and **contribute meaningfully**. It also means that you are respectful of your classmates and their opinions, are punctual to class, and do not engage in negative or disruptive behavior.*

It is important to discriminate between class participation and contribution. Class participation focuses on the benefits of your comments to you, whereas class contributions focus on the benefits to the class. It is only by deeply engaging in the class process will you be able to contribute to the collective learning of the class.

The mean, median, and mode will be around 2. The following provides a guide:

3 shows exceptional insights on the topic and conveys those insights meaningfully to the class

2 is engaged, contributes to the class discussion

1 is silent but attentive

0 is late, or has excused his/her absence

-1 is inattentive, disruptive, or has not asked to be excused for his/her absence

2. I have a very high expectation with regards to Attendance (10%). It is important that you support your colleagues and their effort. Be in class and be prepared. Just to be clear, miss a class and you are at 5%, miss 2 classes and you are at 2%, miss 3 classes and you really aren’t involved.

3. Exam (30%) is scheduled for early November, before your group assignments. The exam will bring a focus to the class lectures, readings, and individual case studies. 2 Hours.

4. Case Study: Class presentation and discussion (35%). On the assigned week the group will provide an organized and in-depth analysis of the environmental problem. The presentation should be only 45-50 minutes long – with the remaining time available for questions and discussion. Clarity and creativity are important aspects of success. All group members *must* be active speakers in the presentation.

Case Study must include an Annotated bibliography and a 1-2 page resource sheet for each class member. Each group will prepare a list of 10-12 book chapter/publication/web sites and indicate the value of this reference to their presentation (i.e. you will write a few lines indicating that you have read and understand this topic). When reviewing this list, I should get an idea of the organization of your presentation and discussion – so if you wish to embed it in an outline of your presentation you will get better feedback.

Case Study must include a Resource kit or web site. Each case study group will put together 1) a 1-2 page summary set of your presentation for distribution to the class, 2) a web site, and 3) a **pdf** of a single reading that will enable the other students to appreciate your topic. Included in your summary should be a list of some pages or chapters or web sites that will benefit the student in his/her review of the material for the class discussion. *The resources kit/web site will be distributed to all class members prior to the class presentation. You must provide it to me on the Friday of **the week before** your presentation so I can post it on the web. On this day you need to download your website as well.*

5. Case Study must include Webcast/Podcast (10%). On the assigned week the group will provide a 5-6 minute audio or video podcast synthesizing the detailed information in your presentation. This will help you learn to “get the information out there!” Never done a webcast/podcast? – we will help, of course.

Missed Course Components

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or supporting documentation to the Academic Counselling Office of your home faculty as soon as possible.

If you are a Science student, the Academic Counselling Office of the Faculty of Science is located in WSC 140, and can be contacted at 519-661-3040 or scibmsac@uwo.ca. Their website is http://www.uwo.ca/sci/undergrad/academic_counselling/index.html.

A student requiring academic accommodation due to illness must use the Student Medical Certificate (https://studentservices.uwo.ca/secure/medical_document.pdf) when visiting an off-campus medical facility.

For further information, please consult the university’s medical illness policy at http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.

If you miss the Exam, without prior discussion with Dr. Trick then you will receive a “0” and no rewrite will be available. If you miss the exam but have authorization from your faculty’s Academic Counselling Office, you will be given a chance to write the exam during the December exam period. It will be a Special Exam that will cover all the lectures and presentations of the class.

The ADMINISTRATIVE FINE PRINT (important and you need to be aware)

Prerequisite Requirements 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 to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites. The prerequisite for this class Biology 2483A or permission of the instructor or registration in year 4 or an Honors Specialization offered by the Department of Biology, Environmental Science or the Basic Medical Sciences Department or a Major in Ecosystem Health.

Accessibility Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 ext. 82147 if you have questions regarding accommodation.

Support Services Learning-skills counsellors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

Statement on Academic Offences Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes Scholastic Offences, at the following website: www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf

Plagiarism Students must write assignments in their own words. Simply finding synonyms for the words of others, or changing the order in which ideas are expressed, does not mean that one has developed an original written response. Whenever students reexpress the ideas of another person, they must acknowledge this by always properly referencing using citations, and by using quotation marks when using the exact words of the author. The same standards apply to journal articles and less traditional sources like newspapers, blog entries, etc. If you have questions about plagiarism or other academic offences, please refer to the UWO calendar for definitions or see the UWO Ombudsman site (www.uwo.ca/ombuds) where you can find a guide to these issues.