NRES 720-3 **Global Change**

University of Northern British Columbia

Lecture M, W 10:00 am - 11:20 am
Teaching Lab Building 8-161
Winter, 2007

Instructors:

Dr. Art Fredeen	Dr. Scott Green
Rm 8-237	Rm 8-335
Ph: x-5847	Ph: x-5817

Course description: This integrative course deals with physical, chemical, biological, and social dimensions of human influence on global conditions such as greenhouse gases, desertification, ozone depletion and eutrophication. Gobal element cycles are used to provide integration. Impacts of global change on people, communities and economies, and adaptation to or mitigation of global change are discussed.

Approach: Through a series of guest-expert lectures, participants will obtain information on earth system function to enable the problem-solving sections that will follow. In the problem-solving sections, participants will develop and deliver two back-to-back presentations that will first provide detail on a particular global change issue/problem of interest, and then second, explore the complexity and trade-off's associated with potential sollutions fo the global change issue/problem.

Reserve text: Kump, L.R., Kasting, J.F., Crane, R.G. 2004. The Earth System. 2nd edition. Pearson/Prentice Hall, New Jersey. pp. 419 (See PART I table for suggested readings).

Required Readings: Papers in pdf format will be assigned for each class, which will be discussed following presentations

==========

NRES 720-3 W'07 Topic list (24 meetings x 80 minutes/meeting total)

Jan.3 Syllabus and Introduction to global changes [Fredeen, Green]

PART 1. The earth system and global change

Date	Topic	Suggested Readings (Kump et al.)
Jan. 8	**Climate:** Earth's climate system -Dr. Peter Jackson	Chapter 4
Jan. 10	**Climate:** Earth's past climates -Dr. Brian Menounos	Chapters 14 and 15
Jan. 15	**Modeling the Ocean/Atmosphere system**: GCM's -Dr. Youmin Tang	Chapter 6
Jan. 17	**Atmosphere**: Composition, GH gases & pollutants -Dr. Peter Jackson	Chapter 3
Jan. 22	**Fresh water**: Reserves, rivers, lakes -Dr. Stephen Dery	
Jan. 24	**Biogeochemistry**: Introduction to the biogeochemical cycles -Dr. Bill McGill	
Jan. 29	**Biogeochemistry**: Carbon- cycle, past and present -Dr. Art Fredeen	Chapter 8
Jan. 31	**Biogeochemistry**: Nitrogen-cycle, past and present -Dr. Bill McGill	
Feb. 5	**Biogeochemistry**: Phosphorus, Sulphur & other elements -Dr. Paul Sanborn	
Feb. 7	**Soils**: Conservation and global change -Dr. Lito Arocena	
Feb. 12	**Remote Sensing**: The imaging of global change -Dr. Roger Wheate	
Feb. 14	**Global change - Biosphere interactions:** Feedbacks & interactions -Dr. Scott Green	Chapter 9

PART 2. Global Changes: Problems and Solutions *[Feb. 26 to April 4]*

Each course participant will be responsible for a two-part presentation to be made over two consecutive meeting dates that focuses on a current or emerging global change issue or problem and ways in which society can address the problem, both from mitigation and prevention as well as adaptation to changes perspectives.

a) Issue/Problem: In the first 80 minute meeting, presenters should provide background to a particular global change issue and problem. One reading should be assigned and distributed 1 week in advance of the meeting date to all course participants that can assist the group in understanding the problem.

b) Solutions: In a second 80 minute meeting to follow, the presenter will lead the group in an exploration of solutions for the global change problem introduced in the first meeting. Solutions should consider both mitigation and adaptation. A second reading should be assigned and distributed 1 week in advance of the meeting date to all course participants that can assist the group in understanding strategies for mitigation and adaptation to this global change issue. Presenters should consider both social and natural/physical science aspects to potential solutions.

Topic suggestions *(Note: You can choose alternative global change problems, but consult with course instructors before finalizing your topic.)*

The ozone hole: The Montreal protocol and beyond
Food security and the future of agriculture
Reconciling the economies of nature and humans
Forests: Valuation and Values
Climate change: A global threat to humanity
Biodiversity: From aliens to extinctions
Genetically modified Organisms - Panaceas or Problems?
Feeding the world: From surplus to starvation
Climate change: Curbing greenhouse gas emissions - meeting our energy needs.
Pollution: Finding cleaner ways to live.
Human population: Strategies for our future on a finite planet.
Water: Getting enough and keeping it clean.

Evaluation:

1) 50% of the student's evaluation will be based on the quality of an annotated bibliography related to the chosen topic above. The two papers provided to course participants should be included, along with at least 28 other journal articles, reviews, book chapters, or books. More details will be given as to what is expected for this assignment.

2) 50% of the student's evaluation will come from professor and peer evaluations of the student's two presentations (25% for each).