

Fall Semester 2014: Geography 3901H: Global Climate & Environmental Change (#19453)

When and Where: Wednesday and Friday in Room 140, Derby Hall (12:45 pm - 2:05 pm)

Instructor: Dr. Ellen Mosley-Thompson (thompson.4@osu.edu)

Geography Office: 1140 Derby Hall; Telephone: 614-292-2580 (W & F only) or -6662 (best, my research office)

Office Hours: Wednesday and Friday 2:20 pm to 3:30 pm and by appointment. I am usually available on short notice for an appointment in my research lab (Byrd Polar Research Center, Room 108E Scott Hall, 1090 Carmack Road, West Campus).

Teaching Assistant: We do not have a TA for this class but **Dr. Stacy Porter** has volunteered to assist. Dr. Porter has a PhD in atmospheric science and is an excellent resource for our class. She will be happy to schedule appointments with you. Her office is in the Byrd Polar Research Center (Room 73 Scott Hall, 1090 Carmack Rd., West Campus). Her email is porter.573@buckeyemail.osu.edu.

Course Objectives: This course is taught in a lecture / seminar format and is designed to provide a more thorough understanding of the scientific basis of both natural and anthropogenic (human produced) climate and environmental changes. You will explore the key issues surrounding 20th century climate change (popularly called global warming) and the role of human activities in shaping the physical, chemical and biological characteristics of the environment that sustains life on Earth. Through readings, lectures, class discussions, student presentations, class debates, field trips and films you will gain insight to how these anticipated changes are likely to affect your future and explore actions by which you may contribute to solutions. You will gain experience using peer-reviewed literature to research a topic and then summarize and present your findings both orally and in writing. A key objective is to provide you with the knowledge base and skills to critically evaluate information you encounter concerning climate change and related environmental issues.

Prerequisites: This course has no prerequisites except that you must be officially admitted to the University Honors Program.

GEC Requirements: This course meets B.A. and B.S. Degree GEC requirements for Natural Science (Physical Science) and Social Sciences (Human, Natural, and Economic Resources). For a detailed discussion of how this class meets the required educational goals see the GEC summary discussion at the end of the syllabus. This is also posted in the information section on Carmen.

Textbooks:

Required:

Dessler, Andrew. *Introduction to Modern Climate Change*, Cambridge University Press, 2012, ISBN 978-0-521-17315-5. Note the library has eBook version (accessible within OSU at: <http://site.ebrary.com/lib/ohiostate/docDetail.action?docID=10514243>). You must log into the library system or use an OSU computer to use it. It may also be purchased from the bookstore or from Amazon. Other resources are available and will be highlighted separately on Carmen.

You will have a variety of selected readings. These will be assigned and made available at the appropriate time.

Other class requirements: You will need a removable storage device (e.g., memory stick) for saving your exercise related work.

Additional Class Materials: Throughout the quarter additional reading and reference materials may be required and will be posted on Carmen. Selected journal articles and chapters from books will be placed under Assigned Class Readings on Carmen and selected book chapters will be placed on **electronic reserve** (also available via Carmen). Additional books will be placed on reserve in the **Geology Library in Orton Hall** under Geog 3901H unless specified otherwise.

You will be alerted in class and by email when updates are added to Carmen.

During first two weeks of the semester the schedule of activities (lectures, guest speakers, group discussions, field trips, debates, presentations, papers, and films) will be developed and posted on Carmen. A **daily class schedule will be provided and updated as class progresses** and you will be alerted regarding those updates in class. Power points from lectures will be posted on Carmen after class (not before). Except for the first week of the class, readings will be assigned the week prior to the presentation and/or discussion of the material. Please remember that this is a lecture / seminar style course and requires that you remain flexible so that we can capitalize on climate- and/or environment-related events and special speakers on campus. Thus the class schedule is always subject to change; students should stay attentive to the Carmen home page for updates and announcements.

In the classroom, be respectful of others, and specifically:

No email, text, phone, web access during lectures and class presentations

So please turn off the mobile devices (phone, laptops, etc.). If you require a laptop during lecture, you must advise Dr. EMT before class.

Grading: (Tentative Scheme, may be adjusted slightly)

Group presentation: 15%

Individual research paper: 20%

Exercises: 22% (Exercise 1 – 8%; Exercise 2 – 8%; Exercise 3 (wedge game) – 6%)

Expository competition (Debate): 15%

Quizzes: 18% (3 quizzes, 6% each)

Participation (5%) and Attendance (5%): This means attending each class and field trips, turning in all work on time, participating in the discussions, asking questions, being attentive and engaged in the class.

A Late assignment will lose 10% credit (based on full score possible) for each 24 hour period it is late and after 3 days (72 hours) no credit will be given unless a prior arrangement has been made with Dr. EMT. Most assignments (not your final paper) may be turned in via the Carmen Drop Box. This is great as it provides a time stamp. Otherwise your assignments must be turned in directly to Dr. EMT and/or Dr. Porter at the beginning of the class when it is due. Late

assignments that are not turned in via the Drop Box must be time-stamped by an employee in the geography main office (1036 Derby Hall) and placed in Dr. EMT's mailbox in the department mailroom (1035 Derby Hall). The office and mail room are open from 8AM to 5PM.

Absences: You are allowed one unexcused absence. An excused absence requires written documentation (doctor's excuse) or prior permission from Dr. EMT to be absent. I consider your requests on a case by case basis. Note that quiz dates will be announced in advance.

An Important Note about Plagiarism and Academic Misconduct: Plagiarism and other forms of cheating will not be tolerated. Please see the Code of Student Conduct (http://studentaffairs.osu.edu/resource_csc.asp). University rules provide severe penalties for academic misconduct, ranging from course failure to dismissal from the university. University rules are found in the handbook used in all survey courses: "University Survey - A Guidebook and Readings for New Students." Any questions about this policy, or your grade, should be brought directly to the attention of Dr. EMT.

Students with Disabilities and Special Needs: Any student needing special accommodation on the basis of any disability must advise the instructor at the beginning of class. All necessary accommodations will be made upon presentation of relevant certification, presented in a timely manner. Students are also responsible for making contact with the Office for Disability Services at 292-3307, 150 Pomerene Hall, prior to or at the beginning of the quarter.

Welcome to this Honors Seminar:

We look forward to working with you as a group and individually as you learn more about your environment and Earth's climate system - past, present and future.

GEC Requirements (this is also posted under Basic Class Information on Carmen)

This course meets B.A. and B.S. Degree GEC requirements for Natural Science (Physical Science) and Social Sciences (Human, Natural, and Economic Resources). **The Natural Science (Physical Science)** requirement expects students to gain an understanding of the principles, theories, and methods of modern science, the relationship between science and technology, the implications of scientific discoveries and the potential of science and technology to address problems of the contemporary world. The material covered in this course, *Global Climate and Environmental Change: Individuals Matter*, spans the physical and social science realms and their intersection. Students explore the physical, chemical and biological aspects of the complex Earth System and human interactions within that System. For example, students are required to attain an understanding of basic electromagnetic radiation theory as they learn about both the natural and the enhanced greenhouse effect. They are introduced to the history of the discovery of "greenhouse gas warming of Earth" and the history of the development of climate models. Students link the enhanced (or anthropogenic) greenhouse effect to human activities associated with the development of technology, resource extraction and use, and economic growth during the 19th and 20th centuries (the Industrial Era). We explore how further technological developments will be essential to efforts to mitigate the accumulation of greenhouse gases in the atmosphere. Students learn about these systems and their complex interactions through lectures,

class discussion, student group presentations, a debate, exercises, quizzes, field trips and a final term paper.

The **Social Sciences (Human, Natural, and Economic Resources)** requirement expects students to gain a better understanding of the theories and methods of scientific inquiry as they are applied to the study of the use and distribution of human, natural, and economic resources and decisions and policies concerning such resources; the political, economic, and social tradeoffs reflected in individual decisions and societal policymaking and enforcement and their similarities and differences across contexts, and to comprehend and assess the physical, social, economic, and political sustainability of individual and societal decisions with respect to resource use. The material covered in this course, **Global Climate and Environmental Change: Individuals Matter** includes a strong emphasis on the use of resources and the associated degradation of the environment. Students explore the impacts of human activities on hydrologic systems, soils and hence food production, ocean acidification and hence marine resources, invasive species and hence ecosystem disruptions, on local to global scales. Global climate change encompasses the global commons (air, water, soil), the impact of human activities on our life support systems, the resilience of many systems and the capacity of humans and human systems to either mitigate future changes, remediate damaged systems and/or adapt to changes that are well underway. The concept of an individual and a shared responsibility to sustain an Earth System capable of supporting the human species runs throughout the class. Students are exposed domestic (cap and trade) and international (Framework Convention on Climate Change; Kyoto Protocol) instruments with the potential to limit and eventually reduce emissions, strategies to slow population growth, to enhance educational opportunities and to reduce hunger and enhance nutrition. We discuss why the developed world has been so slow to take action and by different actors and stakeholders often embrace such divergent views. Knowledge is gained through lectures, class discussions, student group presentations, a debate, exercises, quizzes, field trips and a final term paper.