ENV 230—Global Climate Change

Winter quarter, 2009

Logistics

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Office hours: ½ hour before class or by appointment

Textbook (required): *Dire Predictions: Understanding Global Warming*, Mann & Kump
ISBN 978-0-1360-4435-2

Course overview

The official description: "This course introduces the student to the general principles of climate changes and how it affects weather, agriculture, ocean levels, etc. In recent years, the problem of global climate change became one of the most important issues in science and politics. This course will cover topics like natural and human made climate changes, the handling of proxy data and data methods, and social behavior." This course is designed to convey the basic science of global climate change and to explore potential solutions to this complex problem. To gain a historical perspective, we will briefly review the science and policy responses for another environmental problem: stratospheric ozone depletion. This introductory subject serves as a model for untangling the complex interactions between emissions, atmospheric processes and societal impacts. After studying the science behind the greenhouse effect, we will review a range of topics associated with global climate change. These topics will be developed with the perspective of Earth as an integrated system having properties including both stability/resilience and the capacity for sudden and non-linear change. The course will be primarily based on recent research findings and syntheses presented by the Intergovernmental Panel on Climate Change (Fourth Assessment Report, 2007) and the textbook which is based on this report. Our coverage of this report will provide students with an understanding of the science behind media headlines. Using the knowledge developed in this class, students will create final projects that explore solutions to the problem of global climate change. The over-arching objective of this class is a solid understanding of global climate change science and an appreciation of the challenges in creating solutions to this environmental problem.

Course philosophy

We will strive to have an interactive discussion on the topics addressed in this class. Science is difficult to learn passively—classroom participation promotes active learning. Student learning is the focus of this class, and I expect student participation and feedback in reaching the objectives of the course. Students will be encouraged to provide both formal and informal feedback throughout the semester on course direction, topics and teaching methodology. Also, helpful criticism is always appreciated via email, office hours and after class.

Policies

Daily discussion: Each class session will have a reading assignment as provided on the blackboard site. In addition, there will be 4–5 questions posted related to that day's reading. At the beginning of class, we will spend 10–15 minutes talking over the readings. The questions will be designed to provide each student with a baseline of information and as a starting point for our discussion. The responses to the questions will be collected and counted towards the discussion component of the final grade. Your answers must be printed out and not hand written. To allow for an evolution of discussion topics, these questions will be posted online on the day of the preceding class by 5:00 pm.

In-class presentations: Each student will create a final presentation that covers a possible solution to the issue of global climate change. The format of the presentation is left open, but should meet the following guidelines. You will have 25 minutes to present the report, which needs to include at least 10 minutes of class discussion based on questions you provide one week prior to your report. Possible presentation formats include an oral lecture, a poster with a question & answer session or a video. A formal project proposal is due on **Friday, Feb 6** and should include a detailed outline, a 500 word abstract detailing the concepts addressed in the presentation and a bibliography with at least 10 peer-reviewed sources. Two students can combined their efforts on one project, but all the metrics above will be doubled (i.e., 2 people = 50 minute presentation).

Exam: There will be a midterm for the course given on **Friday, Feb 27**. The midterm will focus on the science of climate change, but will also included material associated with ozone depletion. The final exam will cover the policy responses to climate change discussed during the student presentations.

Class mid-quarter evaluation: As a new faculty member at DePaul, I am particularly interested in student feedback. In addition to the standard end of the quarter evaluation, I will conduct a mid-quarter evaluation to look for ways to improve both the content and delivery of this course.

Blackboard: All class materials and grades will be available on the Blackboard site. I will post all lectures on the Blackboard site within 24 hours after the class and all assignments one week after their due date.

Attendance: Attendance is required for all classes. Students will be allowed to miss two classes without penalty during the quarter. This should cover all 'routine' absences such as colds, doctor appointments, competitions, etc. Further excused absences will only be granted in exceptional circumstances with appropriate documentation. You are still responsible for the discussion questions and they must be turned within one week. After the first two absences, 0.5 points for each missed class will be taken off your final grade. Exams must be taken at the scheduled time. Any exceptions to this policy must be arranged in advance.

Late assignments: All assignments are due at the beginning of class. Any late assignment received before 5pm on the due date will have a 10% grade penalty. After that, late assignments will receive half credit if received within one week.

Academic Integrity: According to the DePaul University Student Handbook, "Violations of academic integrity include but are not limited to the following categories: cheating; plagiarism; fabrication;

falsification or sabotage of research data; destruction or misuse of the university's academic resources, alteration or falsification of academic records; academic misconduct; and complicity." The Handbook also states that, "If an instructor finds that a student has violated the Academic Integrity Policy, the appropriate initial sanction is at the instructor's discretion." For more information, definitions, and examples, see DePaul University's Academic Integrity website at http://academicintegrity.depaul.edu.

Grading

Grades in this class will be determined on the following scale:

>=93	92–90	89–87	86–83	82–80	79–77	76–73	72–70	69–67	66–60	<60
A	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D+**	**D**	**F**

I may change these grade boundaries, but this will always be in favor of the students and will be applied uniformly to the entire class. Grades will be determined from the individual components of the course by the following allocation:

Attendance	**Discussion**	**Final paper**	**Midterm exam**	**Final exam**
15%	15%	25%	15%	30%

Sources of help

If you think you may have special learning needs, please feel free to see me as soon as possible, and every effort will be made to reasonably accommodate your needs.

- **PLuS Program**: for students with learning disabilities and/or attention deficit disorders
- **Writing Center**: for students who need help with writing
- **OSD**: for students with physical disabilities
- **Dean of Students**: accommodations with health or family emergencies

Upon completion of this class, you will be able to:

- Explain what global climate change is.
- Understand how CFCs cause stratospheric ozone loss and the ozone hole over Antarctica.
- Understand the greenhouse effect and how fossil fuel combustion increases surface temperatures by ramping up the greenhouse effect
- Describe how the Montreal Protocol drastically reduced CFC emissions and how this could apply to policies for reducing carbon dioxide emissions
- Know the strengths and weaknesses of proposed strategies to reduce carbon dioxide emissions

Syllabus

Week—Dates	Monday	Wednesday	Friday
1—Jan 5–9	Introduction	Stratospheric ozone depletion	Ozone hole
2—Jan 12–16	Policy response	The greenhouse effect	
3—Jan 19–23	Paleoclimate		History of global warming science
4—Jan 26–30	Global climate models		Climate stability
5—Feb 2–6	Global carbon cycle		Global dimming **(project proposals due)**
6—Feb 9–13	Ecosystem impacts	Regional impacts	Urban impacts
7—Feb 16–20	Kyoto Protocol		Post Kyoto policy
8—Feb 23–27	Carbon sequestration	Review	**Midterm**
9—Mar 2–6	Student presentations	Student presentations	Student presentations
10—Mar 9–13	Student presentations	Student presentations	Student presentation Wrap up

The above schedule is a framework, and changes will be communicated in class and via the Blackboard site.

Class times: Monday, Wednesday & Friday 2:20–3:20 pm
Class location: McGowan South room 206
Final exam: Thursday, Mar 19 11:45–2:00 pm