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## GEOL 116-01, Global Environmental Change, Fall 2009

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**GEO 116: GLOBAL ENVIRONMENTAL CHANGE SPRING 2009**

Environmental change is a process that has happened continuously across geologic time, and which is currently affecting all species on Earth. This course will be a survey of the underlying scientific basis of the issues involved in global environmental change such as population growth, greenhouse warming, sea-level rise, fresh-water, and energy resources. We will also explore the role that humans are playing in altering these systems and examine our own impact as individuals. Over the course of the semester we will make our own analytical measurements both in the lab and in the field, analyze global datasets with GIS, and use computer modeling to understand relevant global systems.

**Course Objectives:**

1. Improve your understanding of the Earth's energy, climate, and water budgets and mankind's impact on them.
2. Gather and analyze data to interpret concepts related to energy and climate change.
3. Apply remote sensing, GIS and system modeling techniques to analyze real datasets on regions around the globe.
4. Improve skills of working in groups, critical reading, and teaching your peers.

**Course Information:**

**Prof.** Jen Houghton, FJ 116E. Office Hours: T 9:30-10:30 am, Th 9:30-12 or by appointment.  
Phone 3089, email: houghtonj@rhodes.edu

**Time:** Lecture T,Th 9:30-10:45am Frazier Jelke C Auditorium  
Lab T 12:30-3:30pm FJ 132E

**Readings:** There is no textbook for this class. Readings will be made available through the Moodle site for this course.

**My Expectations of you:** This course will involve a combination of lecture, hands-on activities, and group work during *both* lecture and lab meetings. I expect you to attend every class meeting and to be engaged and working during class time.

It is essential for you to keep up with the assignments and be prepared for each class. Your ability to understand class material is often dependent upon your preparation. You will notice that class participation is not part of your grade, however, in my experience grades are directly proportional to attendance.

Material we will cover in class as well as additional online resources will be available on our Moodle site as well. All readings are available online through Moodle.

**Course Evaluation:**

The work in lecture and lab is intertwined as closely as possible. Time in lecture will be an introduction to material that will be covered in lab. This will include class discussions, experiments and/or problem solving, and mini-lectures. Lab is a chance to practice applications of the concepts from the readings. Each lab is designed to be a self-contained project, although you will find the major concepts have a way of turning up repeatedly all semester. You will receive the same grade for lecture and lab.

Discussions and	
QRR assignments:	15%
Environmental news forum:	10%
Green Rhodes project:	15%
Midterm assignment:	10%
Lab exercises/reports:	40%
Final assignment:	10%

- Assignments are due on due date. Late=30% off.

Grades will be posted on Moodle.

### **Textbook:**

There is no required textbook for this class. There will be assigned readings each week designed to give background material. These will be posted on our Moodle site. Should you feel you would benefit from having a textbook reference, “Energy and The Environment – 2<sup>nd</sup> edition” by R. Ristinen and J. Kraushaar has been used in the past.

We will be using one book multiple times: “The Long Summer” by Brian Fagan. Since we will only be covering 43% of the content (I counted the pages), I am not requiring that you purchase this book. We have permission from the author (and the library) to post the excerpts we will be reading online through Moodle. However, I am required to have only a small portion of the total material posted at any one time, so I will make the readings available about a week ahead of when we will be discussing them and then remove them from Moodle after we complete that reading.

### **Lab:**

At the beginning of each lab we will have a chance to address questions before we start. Labs will be completed in groups and will consist of a combination of analytical, field, GIS, and modeling projects.

### **Current events journal:**

The class has a forum page on our Moodle site that you will use to keep a class journal this semester of global change events reported in the news (almost like a blog). Each week 5 of you will be assigned the task of choosing and posting one news article for the class to read and respond to in a journal entry. (This means each person will have to choose a news article at most 3 times during the semester.) The class will **vote** on the forum for which of the 5 per week they prefer to discuss in the forum on the Friday before. Should your article be chosen for the class to discuss, you will be excused from having to post articles the remainder of the semester. Entries about the 1 chosen article per week will be posted to the forum and can be responded to as many times as people like. Each person will be required TO VOTE AND to post at least **one original entry AND one response** to someone else’s entry (you will be able to see other entries only after you post your own). The forum will remain open for those articles from the Friday vote to Wednesday at **noon** and then close, at which time the next week’s suggested articles can be posted.

Topics that are frequently reported in the news concerning global change may relate to climate change, biodiversity, endangered species and/or habitat, globalization, global warming, alternative energy, among others. Acceptable news sources are already streaming to our Moodle page in the right hand bar under the section called “Environmental Change in the News”.

### **Homework:**

Homework will consist of short (1-2 page) QRR writing assignments in response to chosen readings. These will be posted on the Moodle site and will be turned in electronically on the Moodle site

The QRR writing assignments will also be uploaded to Moodle by the due date specified in the assignment. Most Thursdays are reserved for in-class discussions of the readings. Part of your course grade will consist of your participation during the in-class discussions of the readings.

### **Green Rhodes Project:**

In lieu of a traditional term project, you will work in pairs to design, collect data, and complete a report on an energy-saving mechanism or plan that could be implemented at Rhodes (pending budget of course). Your report must include a description of the proposed change (for example, switching from flip switches to motion sensor switches in spaces used intermittently), presentation of the data you collect on campus (in this example, how many rooms; how many lightbulbs; how much energy would be saved), a cost analysis (how much would it cost to change and how much money would be saved, i.e. how much time would it take to earn back the cost), and a cover letter written to Physical Plant explaining why Rhodes would benefit from making this change.

\*You are allowed to solicit aid to help collect your data (observations). For example, if you decide to find out how frequently bathrooms are in use around campus to determine how much energy would be saved in switching to motion sensor switches, you may decide to convince several friends to help in determining this information rather than stake out all the bathrooms by yourself.

Due dates:

SEPT. 17: Each pair will have to notify the instructor of their project topic by this date. Should there be duplicate ideas from different groups, topics will be granted on a first-come, first-serve basis.

OCT 22: Your grade on this project will be determined by: 1. the difficulty of the project, and 2. the quality of the submitted project. To assist with this assessment (and to help you get started), each pair will make a brief poster presentation of their proposed project to the class midway in the semester, which your peers will rank in terms of difficulty. The class will determine the difficulty factor to be used in grading the final project, **although** the instructor reserves the right to change this should a project change from this time to completion.

NOV. 19: Final projects will be due by this date. Electronic submission is preferable via email, given the point of this course, although a paper copy will be accepted. Each pair will give a 5 minute in-class presentation of their findings at the end of the semester – we all want to get excited about what you found out!

Standing Extra Credit Options:

There is one Extra Credit QRR already planned in the very last week of the semester. Should you choose to re-read the preface and epilogue of “The Long Summer” and provide a 1-page re-assessment of any changes in your reactions, perceptions, feelings as you read that material, I would be very interested to read it and will offer 1 percentage point added to the QRR portion of your total grade.

There are also standing offers of Extra Credit to be added to the Discussion/QRR portion of your total grade as follows:

For the skipped material from “The Long Summer”, I have provided a list of general descriptions of the skipped content. Should you be interested in any of that material (perhaps it relates to your major or your hobby, etc.) and wish to read it and present a brief 5-minute summary of what we missed to the class, I will award 1 percentage point for doing so and 2 percentage points for doing a smash-up job. There are many interesting topics covered in this book that are beyond the scope of this course or are only tangential to it. But if you are interested, I would like to reward for sharing your personal pursuit of knowledge.