Geography 441: Climate Change and Natural Resources (Fall 2012)

Lecture: Mon, Wed 9-10:50 pm (Dean 201)- 4 credits

Instructor: Dr. Megan Walsh, 308 Dean Hall, 963-3699; email: WalshMe@cwu.edu, office hours: Mon 1-2, Thurs 9-10 am, or by appointment.

Prerequisites: Geog 107 (Physical Geography) or similar preparation, or consent of instructor.

Course objectives:

- To gain a general understanding how the Earth's climate system works and how both natural and anthropogenic factors influence the system.
- To learn the science behind global climate change observations and projections.
- To understand how climate change is currently affecting (and is projected to affect in the future) natural resources: such things as global biomes (distribution and functions), disturbances and natural disasters (fires, hurricanes, severe weather), and global biodiversity (invasions and extinctions).
- (Reading) To be able to read scientific literature, glean the most important information, and be able to discuss it in a classroom setting
- (Research/Writing/Speaking) To be able to successfully research a topic related to climate change, write a scientific paper about that research, and articulately present your findings to the class (graduate students only)

Readings and other resources:

Most of the readings for the course are in a coursepack that is available at the CWU bookstore. Please let me know if you cannot find the coursepack. You need to make sure that you have read the assigned readings before coming to class, especially on discussion days. You will need to bring your coursepack with you on discussion days.

Additional readings, lecture notes, announcements, grades, assignments and other information will be posted on blackboard (courses.cwu.edu). Make sure you check this regularly to insure you know what is going on in class. All assignment will be submitted via Blackboard unless otherwise noted.

Grading: Your grade in the course will be based on your performance on:

Exam 1 (25%)
Exam 2 (25%)
Eight discussion reactions (15%)
Final research paper (25%)
Class attendance and participation (10%)

Grades will be assigned based on the following scale:

A = 100-94, A- = 93-90
B+= 89-87, B= 86-83, B- = 82-80
C+= 79-77, C= 76-73, C- = 72-70
D+= 69-67, D= 66-63, D- = 62-60
F = 59 and below

There are 2 exams in this course worth 25% each. **You will not be allowed to miss or make up an exam unless you notify me ahead of time, and then only at my discretion.** Exam questions will consist of a mix of medium-, and long-answer questions, and will emphasize concepts discussed in class and in the readings. Any material presented during lectures and in the readings is fair game for the exams.

Class will meet for 2 hours twice a week. Lecture/discussion attendance will be recorded daily and attendance is expected. You will be allowed to miss two class periods without it affecting your grade, however, after that you will lose 1% of your attendance grade for every additional class you miss. If you have a documentable emergency, please talk to me as soon as possible. Furthermore, the participation portion of your grade will not be based solely upon your presence in class. To earn these points you will be required to read assigned readings before coming to class, demonstrate that you have completed the readings, and participate in class discussions and activities. Reading quizzes may be given at any time to ensure that you are keeping up on the reading assignments and are part of your participation grade. It will not be possible to make-up these points if you miss class or come to class unprepared. It is in your best interest to come to class ready to pay attention and participate.

At least once during the quarter you will be asked to lead a discussion based on one of the selected readings from your coursepack. You will need to develop discussion questions ahead of time, print them out for your group members, and lead your small-group discussion. You will be graded on the quality of your questions (how well do they make people think and talk about the subject matter?) and your preparedness for the discussion. These points will go toward your participation grade.

Following weekly discussions, you will be required to complete a discussion reaction. The purpose of this assignment is to get you to reflect on our class discussion, or perhaps to have you investigate further a topic of interest that was brought to light during our discussion. All exercises must be handed in by 5:00 pm on their due date (Fridays) via Blackboard. One point will be deducted from the exercise grade for every day (or partial day) it is late (including weekends). **All exercises must still be completed to pass the course, even if they are too late to receive points.** You will be allowed to drop your lowest reaction grade *only if* you have handed in all the assignments. See the individual exercises for more detailed instructions.

You will be required to complete a research paper worth 25% of your final grade. The papers are due Monday December 3rd by 5 pm (please place a hard copy in my mailbox in the Geography Department office). The papers are to be 9-10 pages, typed, 12 pt font, double spaced, times new roman font, 1" margins. All sources must be scientific (I will give more directions about this later) and you must use at least 12 different sources. You must use in-line citations and attach a bibliography with your paper (I don't care what style you use, as long as you are consistent throughout). The paper topic is your choice, but it must in some way address a natural resource that is being impacted by global climate change. This is a very broad topic (I did this on purpose!). I am requiring that everyone meet with me during the second week of school to discuss paper topics. I will set up appointment times with everyone during the first week of class.

Here is a partial list of possible topics just to get your brain going in the right direction:

- The impact of global warming on coral reefs in the South Pacific Ocean
- Human adaptation to sea level rise in coastal Asia
- Water rights in the western US as related to global warming
- Changes in Arctic spring thaw patterns and its relation to caribou migration patterns
- Global warming, fire frequency, and invasive species in sagebrush ecosystems

Policies: You will need to arrive to class on time and leave only when dismissed. Please do not arrive or leave in the middle of lecture. It is distracting for many people, including myself. When in class you are expected to pay attention (please do not engage in unrelated conversations) and participate in all activities and discussions. Cell phones and other communication devices should be turned OFF during class. Anyone talking on the phone, texting, surfing the web, or emailing during class will be asked to leave and will automatically lose all attendance/discussion points for the day. Please be respectful of your fellow students and instructor by following these rules.

Cheating or any other academic misconduct/dishonesty will **NOT BE TOLERATED**. Examples of these behaviors include (but are not limited to):

- Plagiarism (passing off the work of another as that of your own)
- Copying answers from your neighbors during exams/activities or using a "cheat sheet"
- Dishonesty concerning reasons for absence from class or your presence in class
- Any other actions that might give you an unfair advantage over your classmates

All cases of academic dishonesty/misconduct will be treated very seriously. The penalties for engaging in academic dishonesty and/or misconduct can range from a grade of "F" for an assignment/exam to an automatic failure of the course. Please consult the university policy at http://www.cwu.edu/~saem/index.php?page=student-conduct-code if you have additional questions/concerns regarding academic dishonesty or CWU's Student Conduct Code.

Students with disabilities who require academic adjustments in this class are encouraged to meet with me during my office hours to discuss their disability-related needs. Please bring a copy of your Confirmation of Eligibility for Academic Adjustments (or email it to me) and your current class schedule to this meeting. If you are unable to meet during office hours due to class schedule conflicts, please call me at 963-3699 or email me at WalshMe@cwu.edu to schedule an appointment. Students with disabilities who have not registered with the Center for Disability Services are not eligible to receive accommodations/academic adjustments. Please contact the CDS for additional information. Contact info: Center for Disability Services, Boullion room 205, phone: 963- 2171, email: dahlberc@cwu.edu website: http://www.cwu.edu/~dss/cms/

Additional resources: Other useful links can be found at http://www.cwu.edu/~acadadv/programs.php and http://www.cwu.edu/~acadadv/

If you have any questions or concerns throughout the quarter, please email me or come see me! Don't wait until the end of the quarter to voice your concerns. I am here to help you get the most out of this course, so please let me know how I can help.

Note: I consider this syllabus a contract between myself and the students in this course. In writing this syllabus, I have obligated myself to follow the policies and procedures contained herein. By being a student in this course, you are responsible for understanding and following these policies as well. I reserve the right to make changes to this syllabus. You will receive verbal and written notification of major changes to course policies, procedures and content.

Schedule, Lecture/Discussion Topics, Reading Assignments, and Assignment Due Dates:

Date	Day	Lecture/Discussion Topic
Week 0-		
9/19	W	**Lecture:** Introduction to Global Climate Change and Natural Resources
Week 1-		
9/24	M	**Lecture:** The Climate System: Past and Present *Readings*: The Climate System: An Overview (Baede et al., 2001, IPCC: WG1); A Paleoperspective on Global Warming (NOAA Paleoclimatology, 2000) (*online*)
9/26	W	**Discussion 1:** What Can the Past Teach us about Future Climate Change? *Readings*: Abrupt climate change (Alley et al., 2003); Trends, rhythms, and aberrations in global climate 65 Ma to present (Zachos et al., 2001).
10/28	F	Discussion 1 reaction due at 5pm via Blackboard
Week 2-		
10/1	M	**Lecture:** Reading the IPCC Report**-** Atmospheric and Observed Climate Change *Readings*: IPCC Technical Summary pgs. 21-58
10/3	W	**Discussion 2:** Attributing Climate Change *Readings*: IPCC Technical Summary pgs. 58-66; The Denial of Global Warming (Oreskes and Conway, 2010)
10/5	F	Discussion 2 reaction due at 5pm via Blackboard
Week 3-		
10/8	M	**Lecture:** Reading the IPCC Report**-** Global Climate Models and Future Projections *Readings*: IPCC Technical Summary pgs. 66-91
10/10	W	**Discussion 3:** National and Regional Projections of Future Climate Change (team discussion) *Readings*: Global Climate Change Impacts in the US (US GCRP, 2009)- *online*
10/12	F	Discussion 3 reaction due at 5pm via Blackboard
Week4-		
10/15	M	**Lecture:** Global Warming and Oceans *Readings*: AR4-WG1 Ocean Acidification excerpt (*online*); AR4-WG1 Thermal Expansion excerpt (*online*)
10/17	W	**Discussion 4:** Tropical Cyclones and Ocean Acidification *Readings*: Tropical cyclones and climate change (Knutson et al., 2010); Coral reefs under rapid climate change and ocean acidification (Hoegh-Guldberg et al., 2007)
10/29	F	Discussion 4 reaction due at 5pm via Blackboard
Week 5-		
10/22	M	**Lecture:** Climate Change Mitigation Readings: IPCC Summary for Policy Makers Renewable Energy Sources and Climate Change Mitigation
10/24	W	***Exam 1***
Week 6-		
10/29	M	**Lecture:** Climate Change and Polar Regions *Readings*: ACIA Executive Summary (2004)- *online*
10/31	W	**Discussion 5:** Natural Resource Availability in Polar Regions *Readings*: Arctic meltdown (Borgerson, 2008); Climate change in the Arctic: current and future vulnerability in two Inuit communities in Canada (Ford et al., 2008)
11/2	F	Discussion 5 reaction due at 5pm via Blackboard
Week 7-		
11/5	M	**Lecture:** Climate Change and Global Forests *Readings*: Forests as Part of the Global Ecosystem (Forest Ecosystems, Ch. 3, 2008)

11/7	W	**Discussion 6:** Biodiversity, Fire, and Insects, oh My! *Readings*: Climate change, deforestation, and the fate of the Amazon (Malhi et al., 2008); Climate-induced boreal forest change: predictions versus current observations (Soja et al., 2007)
11/9	F	*Discussion 6 reaction due at 5pm via Blackboard*
Week 8-		
11/12	M	**Lecture:** Climate Change and Arid Regions Readings: AAAS Deserts (2000); Climate Change and Drylands (Commission on Climate Change, 2008)
11/14	W	**Discussion 7:** Invasive species and water issues in the Western US Readings: Invasive grass reduces aboveground carbon stocks in shrublands of the Western US (Bradley et al., 2006); Water supply risks on the Colorado River: can management mitigate? (Rajagapalan et al., 2009)
11/26	F	*Discussion 7 reaction due at 5pm via Blackboard*
Week 9-		
11/19	M	**Lecture:** Graduate Student Research Presentations
11/21	W	No Class (Thanksgiving Break)
Week 10-		
11/26	M	**Lecture:** Climate Change and Coastal Regions Readings: Coastal systems and low-lying areas (IPCC, 2007)
11/28	W	**Discussion 8:** Climate Change Impacts on Human Society Readings: The rising tide: assessing the risks of climate change and human settlements in low elevation coastal zones (McGranahan et al., 2007); Climate dangers and atoll countries (Barnett and Adger, 2003)
11/30	F	*Discussion 8 reaction due at 5pm via Blackboard*
12/3	M	**Final Paper due at 5pm in my mailbox in 301 Dean Hall**
12/5	W	***Exam 2*, 8-10 am, Wednesday Dec. 5th**