METEOROLOGY 112: Global Climate Change

San José State University
Spring 2009; Section 8
TTh, 3:00-4:15 pm
Duncan Hall
Room 515
Course web page:
http://www.met.sjsu.edu/~clements/met112/

Instructor: Dr. Craig Clements
Office: Duncan Hall 620B
Phone: (408) 924-5275
Email: clements@met.sjsu.edu
Office hours: TTh 4:30-5:15 PM, or by appointment.

Course Description and Prerequisites:

Meteorology 112 is an Integrated Studies (formerly advanced General Education) course in area “R”, Earth and Environment. This course will help students become integrated thinkers who can see connections between and among a variety of concepts and ideas.

This course introduces students to the science of global climate change including how the interactions among the various elements in the earth’s ecosystem have affected past climates, are shaping today’s climate and will impact future climate. Over the last decade or so, the issue of ‘global warming’ has become one of the world’s most pressing environmental and social concerns.

Prerequisite: Completion of core GE, satisfaction of Writing Skills Test and upper division standing. For students who began continuous enrolment at a CCC or a CSU in Fall 2005 or later, completion of, or corequisite in a 100W course is required.

Learning objectives

The primary goals of this course are the development of an understanding of

1. the natural factors that cause climate change
2. the degree to which human actions are now causing climate change
3. the possible impacts of the resulting climate change on human societies and natural ecosystems.

In addition, the Area R General Education learning objectives are:
- A student should be able to demonstrate an understanding of the methods and limits of scientific investigation.
- A student should be able to distinguish science from pseudo-science.
- A student should be able to apply a scientific approach to answer questions about the earth and environment.
GE Information (from catalog)

SJSU studies (formerly Advanced GE)

- Students must complete one course in each area
- For students who began continuous enrollment Fall 2005 or later, courses used to satisfy Areas R, S, and V must be taken from three separate SJSU departments or other distinct academic units.
- METR 112 satisfies the requirements for area R
- For more information, see this link: http://info.sjsu.edu/web-dbgen/narr/catalog/rec-2058.html

Reading and Textbook

*The Rough Guide to Climate Change*, By Robert Henson  
ISBN: 978-1-85828-105-6  
$16.99

This is a “pocket guide” that includes most of the concepts covered in the lectures. It will make for a great reference for this course.

Additional references
You may find one of the following books useful, particularly in the second half of the course:


Lectures notes

The format of the lectures generally will include a combination of powerpoint slides, overheads, and white board notes. The lectures will be available for download, in pdf format, on the course website after each class. You are expected to take notes during the lectures and supplement your notes with the lecture powerpoint viewslides. It is important to keep an organized binder for your notes, powerpoint view slides and all other material that is handed out. Organization is key to being successful in any upper-division university course.

Assessment

Assessment is designed to determine how well students have achieved the goals of the learning objectives and thus form an important component to the course. Each student will be assessed from a combination of assignments, exams, article review and a term paper. Assignments will include both in-class and take home components and will include problems and written responses. There will be two mid-term exams and a final exam. The final exam is comprehensive.
Students will need to bring a scantron (Form No. 882-ES) for the midterm and final exam.

<table>
<thead>
<tr>
<th>Assignments (In-class, home work, quizzes)</th>
<th>20%</th>
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</thead>
<tbody>
<tr>
<td>Midterm Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Article Reviews</td>
<td>20%</td>
</tr>
<tr>
<td>Term Paper/ Oral Presentation</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam / Project</td>
<td>20%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100 %</strong></td>
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**Grading Scale:**

- 90-100 = A
- 80-89 = B
- 70-79 = C
- 60-69 = D
- Below 60 = F

A +/- grading system will be used for final grades.

Arrangements for missing a midterm due to medical reasons (a medical certificate will be required) will need to be arranged privately. However, this does not apply to the Final Exam.

**Late assignments will not be accepted.**

**Assignments will not be accepted via email.**

**Writing in this course**

Written work represents a significant fraction of the total grade of the assessment for this course (~ 3000 words in total). Writing in this course will be spread across the various assignments including the in-class and home work, exams, article review, and the term paper.

**Assignments (in-class and home work)**

Assignments will be given throughout the duration of the course. These will consist of a number of different activities that will either be completed in class, or as a take home, and turned in at the beginning of the next class. Late assignments will not be accepted. If you miss an in-class activity, there will be no opportunities to make up the missed points.
**Article Reviews**

In this course we will read a number of current scholarly journal articles. You will be required to read the paper and write a review of it as it pertains to the subject of climate change. These assignments will be assigned throughout the semester. The format of the reviews will be two page maximum, 12 font, double spaced. The reviews should be critical of the article and discuss the weaknesses and strengths of the article. Must be well written with little or no grammatical errors!

**Term Paper**

The goal of the term paper is to allow the student to research a specific topic which is of interest to them. The term paper is aimed at getting the student to develop their own ideas outside of the lectures. All term paper topics must be approved by the instructor. The format will be similar to the article reviews (TBD), but more in depth and more development. You will be required to include references (minimum of 5) and correctly cite them in your paper using the American Meteorological Society Reference Style (to be discussed in class). The format: a maximum of 4 pages, double spaced, 12 point font ONLY. You may include figures, graphs, and any other photos, etc. These will not be imbedded into the text, but included at the end of the document. You will need to reference the figures that you use. The paper will be graded on content (50% of the grade) and style, format, and grammar.

**Writing and Plagiarism**

Writing is an extremely important component to any subject knowledge as it communicates that knowledge to other people. Through the use of the internet, plagiarism has become an increasing problem on college campuses. Although it may seem amazing to you, some students believe that completing their homework requires scanning the internet (i.e. Google it), finding the answer and then cutting and pasting their answer into a word file with their name at the top. This is certainly not acceptable.

This is one example of plagiarism and is considered unethical behavior at this university. SJSU is a learning institution where the goal to develop freethinking students who can analyze new concepts and develop their own ideas and opinions. In order to discourage plagiarism, the course will adopt a zero tolerance approach. If submitted work is found to be plagiarized, the student (or students) overall grade will be lowered by 10% and their case will be submitted to the university judicial board for review. The course will also use turnitin.com (www.turnitin.com), a plagiarism detection tool, for the course term paper.

The password and account will be given in class.

**Plagiarism:** When you assume credit for something that someone else has written, that is stealing at this University.

*Academic integrity statement from Office of Student Conduct and Ethical Development:*  
“Your own commitment to learning, as evidenced by your enrollment at San José State University, and the University’s Academic Integrity Policy requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the Office of Judicial Affairs. The policy on academic integrity can be found at [http://sa.sjsu.edu/judicial_affairs/index.html](http://sa.sjsu.edu/judicial_affairs/index.html).
Campus policy in compliance with the Americans with Disabilities Act:
If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with DRC to establish a record of their disability.

Incompletes:
An "incomplete" will be given for the course only under the following conditions:
1. At least 60% of the course work has been completed and
2. Unexpected circumstances prevent the completion of the remaining work.

An incomplete will not be given to circumvent rules concerning the dropping of courses!

Cell phones and Laptop computers:
Students and Instructor will please turn their cell phones off or put them on vibrate mode while in class. Please do not answer your phones in class. Students whose phones disrupt the course and do not stop when requested by the instructor will be referred to the Judicial Affairs Officer of the University. Laptop computers may only be used for taking notes in class, any abuse of laptop use in class will result in banning their use in the classroom for all students.

Punctuality, etc.:
Please make every effort to arrive on time. Please do not start making preparations to leave (e.g., closing notebooks) prior to the scheduled end of the class. Please inform me if you need to leave class early; try to take a seat near the front of the classroom to avoid disruption of the class as you leave.

Tentative Course Calender
(Any changes will be announced at least one week in advance.)

<table>
<thead>
<tr>
<th>Papers/Exams</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Exam 1</td>
<td>3/19</td>
</tr>
<tr>
<td>Term Paper</td>
<td>4/23</td>
</tr>
<tr>
<td>Last day of classes</td>
<td>5/13</td>
</tr>
<tr>
<td>Final Exam Day</td>
<td>Thursday, May 21 Time: 1445-1700</td>
</tr>
</tbody>
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* Please note the date and time of the final exam. I expect all students to be available to take the final exam at this time. (Consider this when booking plane flights!)
Met 112 List of Topics

Part I: Natural Climate
- Introduction to atmospheric structure
- Earth’s energy balance
- Climates: micro and global
- Greenhouse gases and the greenhouse effect
- Atmospheric circulation and climate
- Clouds and climate
- Glaciers and icesheets
- History of past climates
- The Carbon Cycle

Part II: Anthropogenic Forcing and the Future
- Recent climate change
- Anthropogenic greenhouse gases
- Carbon dioxide and energy use
- Aerosols
- Future predictions and impacts
- Evidence for recent unnatural warming
- The surface temperature record
- Proxy-derived temperatures

Part III: Connections with our world
- Comparison of computer simulations of past climate with temperature records
- Computer projections of future climate change
- Possible impacts of projected changes on human societies and ecosystems
- Resource Management: Water
- Adaptation and mitigation strategies
- Political and economic issues