



Weather, Climate, & Climate Change

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Course Goals:

In this course, you will

- ⇒ Read, comprehend, and discuss scientific texts about atmospheric processes;
- ⇒ Analyze data and draw reasonable inferences from it;
- ⇒ Critically examine the evidence that scientists use to generate theories about Earth processes; and
- ⇒ Consider some of the possible social, economic, and environmental ramifications of human-induced climate change.

Course Texts:

Earth's Climate Past and Future (3rd ed) by William F Ruddiman

Understanding Weather and Climate (7th ed) by Edward Aguada and James Burt

Additional readings provided on Moodle

Course Description:

The Earth's climate system is complex and dynamic, and a solid understanding of this system is crucial in order to address concerns about anthropogenic influences of climate. In this course, we examine the basic physical and chemical systems that generate daily weather conditions and our modern climate system, including the role of incoming solar radiation, the greenhouse house, and ocean and atmospheric circulation and well as the natural fluctuations within these systems. We also look critically at the methods and archives used to reconstruct the climate in the past (for example, ice cores, tree rings, sedimentary deposits) and use them to evaluate how scientists make predictions for the future. Although this course is taught primarily from a scientific perspective, it includes frequent discussions of political science, economics, sociology, and ethics. I encourage all students to bring their knowledge from other classes to bear during this discussions, and, most important, approach the material with a curious mind.

Grading:

Grades will be based on your performance according to the following:

Section Exams:	3 @ 25% each
In class assignments/participation:	15%
In class quizzes:	10%
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	100%

Grades will be assigned using the standard scale with plus and minus scores (i.e 80 – 83 % = B-, 84 - 86% = B, 87 – 89% = B+, etc.). In some cases this grade may be adjusted based on class performance. In no case will you earn *less* than the standard grade.

Course Policies and General Information

 Your attendance and active participation in class are essential for you to learn this material and therefore, **attendance is required**. If you need to miss a class because of sickness or personal emergency (see [student handbook](#)), please try to let me know ahead of time so we can arrange a time for you to make up the material. If I do not hear from you within 24 hours of a missed class, your absence will be considered unexcused and you will not have a chance to make up any graded material.

 This course is divided into three major units (see descriptions on Moodle). Each week, I will provide handouts with important concepts, definitions, and images. We will also frequently refer to images in your book, so please bring it with you to all classes. The purpose of providing class notes is to keep you organized and to minimize errors associated with copying from the board. However, these notes are deliberately skeletal, and you will need to flesh them out with your own annotations, sketches, explanations, etc. There will be a \$15 charge to cover the printing cost of these notes.

 To help you learn to apply class material, you will regularly be assigned small projects or assignments to complete in or out of class. Although these frequently won't be assigned letter grades, they will contribute to your overall class participation grade. Due dates for these assignments will be announced when they are assigned and **late assignments will not be accepted**.

 Your third exam is scheduled for **Wednesday, May 13 at 8:30AM** and *must be taken at this time*. It is against University Policy to take final exams at other times. Please plan your travel accordingly.

 To be successful in this class, you will need to come to class prepared and actively participate in all class activities (including lecture!) This means you need to read the assigned material, complete assignments before class, and perhaps most importantly, *ask questions about anything you don't understand!!* You can ask questions in class, during office hours, during lab, or via email. I am available to help you, but it is your responsibility to figure out what you need help with!

 If you have a condition or disability that will affect your ability to participate in any class activity, please make an appointment with Pamela Roberts, Coordinator of Student Disability Services and ADA Compliance, for further information on how to receive accommodations and support. Her office is on the second floor of the UB, 765-658-6267.

****Academic Integrity**** Any activity which gives one student an unfair advantage over other students will be handled in accordance with established University procedures as described in the Student Handbook. I take academic integrity *very* seriously and will pursue charges if a student cheats in this class. Failure to understand the policy is no excuse; please ask me if you have any questions.

Approximate Schedule and Important Dates

As you know from your other classes, the pace of any particular course may vary from the ideal schedule for a variety of reasons. Trust me, this is a *good* thing....we wouldn't want to push forward just because the syllabus says so! However, I know of your need to plan for the semester, so here is a guide to the whole semester. Specific topics and reading assignments will be provided on Moodle with each major section.

Section 1: Introduction to Weather and Climate

Week 1: Introduction to the atmosphere, Use of the scientific method

Week 2: Solar Radiation, Energy Balance, and Temperature

Week 3: Atmospheric Pressure & Wind

Week 4: Atmospheric & Oceanic Circulation

Week 5: Modern Climate

****Exam 1 – Friday, February 27**

Section 2: Geologic Climate Change

Week 6: The Carbon Cycle, Feedback & Forcing

Week 7: Tools of Climate Science

Week 8: Climate Change Through Time

Week 9: *Spring Break – be safe, have fun!*

Week 10: Special Weather Topics

****Exam 2 – Friday, April 3**

Section 3: Human Changes to the Atmosphere

Week 11: Evidence for Anthropogenic Climate Change

Week 12: Evidence for Anthropogenic Climate Change – con't

Week 13: General Circulation Models

Week 14: Consequences of Climate Change

Week 15: Atmospheric Pollution

****Exam 3 (during finals week) – Wed, May 13**