

# Geography 388: Climatology (Winter 2013)

**Lecture: Tuesday and Thursday 9-10:50 pm (Dean 211), lab: Wednesday 3-4:50 pm (Dean 206)- 5 credits**

**Instructor:** Dr. Megan Walsh, 308 Dean Hall, 963-3699; email: walshme@cwu.edu, office hours: Tuesday 3-4 pm and Friday 9-10 am or by appointment.

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

**Overview:** Climatology is the study of the Earth's climate system, which is a set of environmental systems including the atmosphere, hydrosphere (ocean and other water bodies), cryosphere (ice and snow), lithosphere (rocks and landforms) and biosphere (living organisms), that are coupled to one another and vary over time and space. This course covers the basics of energy and moisture in the climate system, atmospheric circulation processes and patterns, weather phenomena such as hurricanes and tornadoes, and the spatial and temporal variations of climate, including those produced by human action. The course will also trace the development of our understanding of the physical basis of climatology, the development of conceptual and numerical models of climate, and how complex systems like the Earth's climate system are studied.

## Course objectives:

- To be able to analyze, describe, and diagram the basics of the Earth's atmosphere and major atmospheric processes including energy, pressure, wind, precipitation, air masses, fronts, and storms
- To be able to perform basic calculations pertinent to these processes with fundamental algebra skills
- To recognize the relationships and linkages between the parts of the Earth's energy budget and explain the factors controlling temperature and precipitation patterns on Earth and to describe the distribution of climates of the World
- To be able to describe the impacts of weather on human activity and impacts of humans on climate
- To understand the tools and technologies used to produce weather forecasts
- To be able to locate and interpret weather maps and satellite images available on the www and to understand what these mean in terms of local/regional/global weather and climate patterns
- To understand past, present, and future trends in natural and anthropogenic climate change

**Text and other resources:** *Visualizing Weather and Climate*, Anderson and Strahler, 2008, ISBN 978-0-470-14775-7, paperback, 500 pages (required). Additional readings will be posted on Blackboard. Please make sure to bring a notebook to every class. I will advise you ahead of time if it is necessary to bring your textbook to class.

Grades, lecture notes, announcements, lab 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!

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

Exam 1 (20%)  
Exam 2 (20%)  
Four quizzes (10%)  
Eight lab exercises (25%)  
Final lab project (20%)  
Class attendance and participation (5%)

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

**Exams and Quizzes:** 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. Quizzes may be given at any time during the lecture period in which they are scheduled; you will be allowed to drop your lowest quiz grade. With adequate documentation of a medical or other issue that created an unavoidable absence, scores from another quiz may be substituted for a single missed quiz. Exam and quiz questions will consist of a mix of multiple-choice, true/false, short answer, and long answer questions, and will emphasize concepts (as opposed to factoids). Exam and quiz questions will also test on your ability to synthesize material presented in the lectures, readings, and labs, as well as to interpret weather maps, radar and satellite images, and time-series graphs.

**Policies:** Lecture will meet for 2 hours, twice a week. Lecture attendance will be recorded daily and will go toward the attendance and participation portion of your grade (5%). It will not be possible to make-up these points if you miss class; everyone will be allowed to miss two days of class without it affecting your attendance grade. It is in your best interest to come to every class and pay attention. Please ask for help as soon as possible if you are lost or confused. DO NOT wait until after an exam!!! In addition to the usual reading and study, it will be beneficial to spend a little time each day to follow the day-to-day variation of weather and the progression of the season in a regular fashion (I will explain more on this later).

Lab will meet for 2 hours once a week (Wednesday) and attendance is required. Lab exercises will involve the analysis of information from the internet that illustrates the day-to-day and seasonal variations of weather and climate and are worth 25% of your final grade. Lab exercises can be found on blackboard under "Assignments" and will be submitted online. The in-class portion of the labs should be completed within the 2-hour lab period. The take-home portion of the lab exercises may require an additional 1-2 hours per week. All exercises must be handed in by 5:00 pm on their due date (see the schedule below). One point will be deducted from the exercise grade for everyday 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 may collaborate with someone else on the exercises, but all work turned in must be your own. See the exercises for more detailed instructions. There will be several questions on each exam based on lab material.

In addition to the lab exercises, you will be required to complete a final lab project worth 20% of your final grade. The final project will be 7-8 pages in length (not counting tables, graphs, and bibliography) and will be the culmination of research you carry out throughout the quarter. The lab projects are due Monday March 12<sup>th</sup> by 5 pm. No late papers will be accepted.

There will be one required field trip during the quarter. We will try to schedule it for a Friday afternoon, but if this doesn't work for everyone we will schedule the field trip on a Saturday near the end of the quarter.

#### **Additional 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](mailto:walshme@cwu.edu) 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, Bouillion room 205, phone: 963- 2171, email: [dahlberc@cwu.edu](mailto: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.

**Tentative schedule, lecture topics, reading assignments, and lab topics/due dates:**

<b>Date</b>	<b>Day</b>	<b>Topic</b>	<b>Reading</b>	<b>Assignment due dates</b>
<i>Week 1-</i>				
1/3	Th	Introducing Weather and Climate	Chapter 1	
<i>Week 2-</i>				
1/8	T	Earth's Atmosphere	Chapter 2	
1/9	W	Lab 1- Basic Weather Observations		Lab 1 due 5:00 pm 1/11
1/10	Th	Earth's Global Energy Balance	Chapter 3	
<i>Week 3-</i>				
1/15	T	Surface Temperatures	Chapter 4	
1/16	W	Lab 2- Recent Conditions at Ellensburg		Lab 2 due 5:00 pm 1/18
1/17	Th	Atmospheric Moisture <b>(Quiz 1)</b>	Chapter 5	
<i>Week 4-</i>				
1/22	T	Winds	Chapter 6	
1/23	W	Lab 3- Satellite Images and Radar		Lab 3 due 5:00 pm 1/25
1/24	Th	Global Circulation	Chapter 7	
<i>Week 5-</i>				
1/29	T	Midlatitude Weather <b>(Quiz 2)</b>	Chapter 8	
1/30	W	Lab 4- Atmospheric Circulation and Forecasts		Lab 4 due 5:00 pm 2/1
1/31	Th	Tropical Weather Systems	Chapter 9	
<i>Week 6-</i>				
2/5	T	<b>Exam 1</b>		
2/6	W	Lab 5- Global SSTs and Tropical Cyclones		Lab 5 due 5:00 pm 2/8
2/7	Th	Thunderstorms & Tornadoes	Chapter 10	
<i>Week 7-</i>				
2/12	T	Weather in the Pacific Northwest	Mass reading (online)	
2/13	W	Lab 6- Weather and Climate along I-90		Lab 6 due 5:00 pm 2/15
2/14	Th	Global Scope of Climate	Chapter 11	
<i>Week 8-</i>				
2/19	T	Climates of the World <b>(Quiz 3)</b>	Chapter 12	
2/20	W	Lab 7- Recent Climatic Variations		Lab 7 due 5:00 pm 2/22
2/21	Th	Climate Variability Part 1	Chapter 13	
<i>Week 9-</i>				
2/26	T	Climate Variability Part 2	Chapter 13	
2/27	W	Lab 8- Climate Trends		Lab 8 due 5:00 pm 3/1
2/28	Th	Video- The Big Chill and discussion		
<i>Week 10-</i>				
3/5	T	Human-Induced Climate Change <b>(Quiz 4)</b>	Chapter 16	
3/6	W	Lab 9- Project Data Analysis		No lab due
3/7	Th	Climate Projections	Chapter 16	
3/11	M	Final Lab Project due by 5pm (turn in hard copy to my mailbox)		
3/12	T	<b>Exam 2- 10-12:00pm</b>		