

# **GEOG 235 - WEATHER AND CLIMATE**



Fort Lewis College, Dept. of Geosciences, Spring Semester 2015, 10:10-11:05 a.m. M W F, Berndt Hall 310

Instructor: Scott White, Ph.D.

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Office Hours: M W Th F 11:15-12:10, Tu 2:30-4:30, or by appointment

Class and lab information and documents are available through Canvas at <https://courses.fortlewis.edu>.

## **Required Text:**

*Understanding Weather and Climate*, 6<sup>th</sup> edition, 2013, Edward Aguado and James E. Burt, Pearson Education, Inc. (ISBN 978-0-321-77321-0). This textbook is available in paper format from the FLC Bookstore and in eTextbook format from CourseSmart (<http://www.coursesmart.com/0321773217>). A copy is also on reserve in the Reed Library.

## **Course Description and Learning Outcomes**

In this course, we will explore the fields of **meteorology** and **climatology**. Meteorology is the scientific study of the atmosphere and the processes that cause our weather, while climatology is the study of climate – the statistical properties of the atmosphere. This course is entitled “Weather and Climate” because those are the two fundamental components of meteorology. Weather affects us daily, and throughout this course, we will discuss the impact of weather on our lives. In turn, humans can affect the long term patterns of weather, which is what we call the climate. In this class, we will also discuss the different climate regimes in the world, and how climate patterns across the globe are currently changing. Special emphasis will be placed on such topics as snow and ice, severe storms, weather forecasting, satellite and radar imagery, human impacts on the atmosphere, and the environmental, political, economic, and social ramifications of Earth's changing climate. GEOG 235 is an approved Natural and Physical Sciences (SC2) course in the Colorado statewide guaranteed transfer general education program known as gtPathways. Refer to the 2014-2015 FLC Catalog (<http://catalog.fortlewis.edu>) for more information.

## **Course and FLC Policies**

- Make-up quizzes and/or exams will only be permitted if you have a valid excuse (valid = sickness, family issues, death; not valid = vacations, hunting trips, early Spring Break). Contact me if you miss a quiz or exam. Make-up exams may be different from those given to the other students, and may consist entirely of short answer and/or essay questions.
- Individual quiz and exam grades are not curved, but final course grades may be adjusted at the end of the semester.
- No extra credit assignments will be offered, although extra credit points may appear on the quiz and exams.
- If English is not your primary language, you may use a dictionary during the exams only if you discuss this with me in advance.
- You are responsible for all materials presented during class. Lecture notes are not posted on the class website. Come to class. Listen and participate. Take notes during the lecture. Exam questions will come primarily from the lecture material.
- The last day to drop this class without a recorded grade is Tuesday, January 27 (census date). The last date to withdraw from this class is Friday, March 6. For withdrawals after this date, contact the Associate V.P. for Academic Affairs. Keep in mind that you have a limit of three individual course withdrawals for the duration of your time as a student at Fort Lewis College. It is your responsibility as a student to ensure that you are properly enrolled in this course. It is not possible to add courses after the Census Date. Login to WebOPUS at <http://webopus.fortlewis.edu> to verify your enrollment status.
- Students with disabilities have equal access and equal opportunity in this course. If you require reasonable accommodations to fully participate in course activities or meet course requirements, you must register with Disability Services, 280 Noble Hall, 247-7459. If you qualify for services, bring your letter of accommodation to me as soon as possible.
- Cheating and plagiarism will not be tolerated, and may result in a zero score on the assignment, quiz, or exam in question, a final course grade of F, and/or referral to the Vice President of Academic Affairs. I expect that all students will abide by the FLC Student Conduct Code (refer to your FLC Student Handbook) at all times in this class.
- Please turn off your cell phone, or set it to vibrate, before entering the classroom. Do not text, and do not use headphones/earbuds during class or exams. No visible personal electronics are permitted, with one exception. If you wish to use a laptop or tablet computer to take class notes, that's OK.
- I expect you to be on time to class (10:10 a.m.), and to remain in class the full 55 minutes. Unless you are sick, do not disrupt the class by randomly leaving and then reappearing. *Thank you for reading these policies!! ☺*

## Course Grading and Assignments

Grading follows the typical A, B, C, D, and F scheme, with + and – counting towards your final course grade:

A = 93-100	B+ = 87-89	C+ = 77-79	D+ = 67-69	F = < 60
A- = 90-92	B = 83-86	C = 73-76	D = 63-66	
	B- = 80-82	C- = 70-72	D- = 60-62	

Grades will be based on a **map quiz** (50 points), **two exams** (100 points each), a **final exam** (150 points), **five homework or in-class assignments** (25 points each), and a **weather journal** (100 points) = 625 points total. The map quiz will consist primarily of place name identification for various geographic features of the globe that are pertinent to this class. The three exams will consist of a mix of multiple choice, fill-in-the-blank, and/or short answer/essay questions taken from the lecture notes. Study guides will be available prior to the quiz and each exam. Five homework and in-class exercises will be assigned at various times throughout the semester. Each one of these assignments will be scaled to 25 points. The weather journal will be your opportunity to describe the weather you experience locally over a two-week period. The due date for the weather journal is Monday, April 13. More details will be available later in the semester about this project.

## GEOG 235 Course Schedule – Spring 2015

[ Like the weather, this schedule is subject to change. ]

<u>Week of...</u>	<u>Topics</u>	<u>Textbook chapters</u>
Jan. 12	Composition and Structure of the Atmosphere	1
Jan. 19	Solar Radiation and the Seasons	2
Jan. 26	<b>Map Quiz</b> (Jan. 26); Energy Balance and Temperature	3
Feb. 02	Atmospheric Pressure and Wind	4
Feb. 09	Atmospheric Moisture; Clouds	5, 6
Feb. 16	<b>Exam #1</b> (Feb. 16); Precipitation Processes	7
Feb. 23	Atmospheric Circulation and Pressure Distributions	8
Mar. 02	Air Masses and Fronts; Midlatitude Cyclones	9, 10
Mar. 09	Lightning, Thunder, and Tornadoes	11
Mar. 16	<b>Exam #2</b> (Mar. 16); Tropical Storms and Hurricanes	12
Mar. 23	<u>S P R I N G B R E A K</u> ☺ <u>S P R I N G B R E A K</u>	
Mar. 30	Weather Forecasting and Analysis; <b>Weather Journal Assigned</b> (Apr. 03)	13
Apr. 06	Human Effects on the Atmosphere; Earth's Current Climate Zones	14, 15
Apr. 13	Climate Changes of the Past; <b>Weather Journal Due</b> (Apr. 17)	16
Apr. 20	Climate Changes Now and in the Future; IPCC Fifth Assessment Report (AR5)	16
<u>Finals Week</u>	<b>Exam #3</b> (Wednesday, Apr. 29, 9:45-11:45 am)	

# GEOG 235: Weather and Climate – Syllabus Addendum

## Spring 2015

Credit Hours in this Course: For GEOG 235, you will receive 3 college credits assuming that you have a passing grade at the end of the semester. You should expect to spend at least 4-6 additional hours per week on out-of-class reading, assignments, and exam/quiz preparation.

Course Learning Outcomes: After successful completion of GEOG 235, a student should be able to:

- understand how weather phenomena form and evolve in Earth's atmosphere
- understand the role that the Sun plays in heating the planet's surface and atmospheric gases
- comprehend the spatial and temporal distribution of water in the Earth's atmosphere and surface
- read and interpret both current surface weather maps and weather forecast maps
- understand and analyze the complex issue of climate change from the perspective of science, including causes, adaptations, mitigations, economics, politics, and controversies

State of Colorado gtPathways Course Criteria and GEOG 235: The gtPathways course criteria for Natural and Physical Sciences subjects (SC-1 and SC-2) can be found online at <http://highered.colorado.gov/academics/transfers/gtPathways/Criteria/Content/natphysci.pdf>.

- GEOG 235 meets the gtPathways Natural and Physical Sciences (SC-2) criteria by providing students with:
  - a foundational knowledge of meteorology and climatology
  - an understanding of how the scientific method is used in these two fields
  - a basic understanding of the mathematics underlying meteorological and climatological processes at various temporal and dimensional scales
  - an understanding and appreciation of how weather and climate are related to other fields of inquiry such as cultural geography, geology, chemistry, physics, biology, and history
  - abilities to think critically about scientific principles, and understand the difference between science and nonscience, particularly as they relate to climate change

Fort Lewis College Liberal Arts Core (LAC) Outcomes and GEOG 235: The list of FLC LAC outcomes can be found online at <http://www.fortlewis.edu/academicaffairs/CollegeWideLiberalEducationOutcomes.aspx>.

- In this course you will gain experience using modern methods of weather and climate prediction and forecasting primarily through map work and data analysis.
- During the lectures, discussions, in-class, and out-of-class assignments, it is expected that you will use your critical thinking skills as you seek to understand how the weather works, and why and how the climate is changing.
- In GEOG 235, you will develop stronger writing skills through assessments such as exams, assignments, and in-class presentations.

Signature Assignment(s) for GEOG 235: The signature "assignments" for this course will be based on quizzes and/or exams, and the capstone weather journal assignment. Each quiz and/or exam will have a written component based on class lectures. These exams will test your ability to recall important information presented during the class lectures. You will also complete a weather journal assignment which will incorporate weather forecasting, mapping analysis, and data collection in your local home area. Each learning outcome described above will be a part of one or more of the exams or assignments. Your grades on these exams and assignments will form a major part of your overall grade in this course.