

Geography 208 – Weather and Climate

Fall 2023

Instructor:	Dr. Samantha Kaplan
Office:	D-327 Science Building
Office Hours:	In person: Tuesdays 12:00 - 1:00 pm, Thursdays 1:00-2:00 pm, Zoom: Mondays 1:30-2:30 pm, and by appointment
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Required Text:	Ahrens and Henson, 2022. Meteorology Today: An Introduction to Weather, Climate, and the Environment, 13 th Ed. Cengage, 602 p.
Lecture:	Tuesday & Thursday 11:00 am – 11:50 am D320 Science
Lab:	Thursday 2:00 – 3:50 pm D320 Science

Students with Disabilities: Students with learning and/or physical disabilities are encouraged to contact me to make any special arrangements for taking lecture notes or exams.

Catalog Description: 3 Credits with lab. Earth's energy balances; composition, characteristics, circulation of the atmosphere, air masses, and weather systems. Introduction to weather map analysis and forecasting. Severe weather, air pollution, causes and consequences of climate change.

Learning Outcomes:

As a Natural Science (NS) general education course, the following course attributes will be in effect per GEP guidelines:

- Explain major concepts, methods, or theories in the natural sciences to investigate the physical world.
- Interpret information, solve problems, and make decisions by applying natural science concepts, methods, and quantitative techniques.
- Describe the relevance of aspects of the natural sciences to their lives and society.

Specific to this course, the following objectives describe the goals you will achieve this semester.

- Recognize similarities and differences between weather and climate, how they are related, and how they impact life.
- Describe basic atmospheric processes, how and why they occur, and the role they play in general circulation of the atmosphere and climate.
- Observe the weather and interpret what the observations mean in terms of current weather and developing forecasts.

- Explain the primary drivers of climate change on various time scales and the role of natural and phenomena and anthropogenic activities in climate and weather variability.
- Apply basic physical science and mathematics concepts, including, but not limited to, measurements, dimensional analysis, and reading and interpreting charts and graphs to form and test hypotheses.
- Evaluate arguments about current weather and climate topics in order to form their own opinions about climate change and to recognize misinformation (deliberate or otherwise) in the world around us.

Classroom Policies

- No talking, texting, emailing, web-surfing, or listening to music during class. This is disruptive and discourteous to your peers and to the professor. Phones and other electronic devices must be turned off. Laptops and tablets may be used for note-taking, but only with prior approval. Any student found violating these rules will be asked to leave the classroom.
- Attendance is expected at all class meetings. If you have to miss class, it is your responsibility to inform the instructor ahead of time and get notes from a peer.
- I do not post lecture notes on-line and I do not share my lecture notes with students. Please do not ask. If you miss class, it is your responsibility to get the notes from a classmate. I will post Power Point lecture slides following class (not before).
- E-mail communication must contain a subject line, the course number (Geol 104) and be courteous and coherent for a response.
- Canvas will be used for most course communication outside of Lecture and Lab. Please check Canvas regularly for course updates and announcements.

Illness Policies

- Do not come to class if you do not feel well. Even if you think "it is just allergies" or that extra beer you had the night before.
- Online accommodations in the event of illness or other personal emergency will only be made at the discretion of the professor.
- Please have a back-up plan to get notes, etc. in the event of an absence.

Lecture and Homework

- In addition to two weekly lecture sessions, students will complete assigned readings from the textbook and from various online sources.
- Assigned readings appear on the Class Schedule on the **Home** page of Canvas.
- There will be several homework exercises assigned in class. These are separate from the lab exercises. They will also be posted on the Canvas **Assignments** page and are to be turned in there as well.

Lab

- The laboratory portion of this course involves both hands-on experiments as well as map and data analysis.
- Lab sessions are mandatory and attendance counts towards your overall grade.
- All lab assignments and materials are distributed in class. Additional materials and digital copies are posted on the main Canvas course site (not on a separate tile). They will be in the Lab module on the **Home** page and the **Assignments** page.
- There will be eleven (11) lab assignments of which your best ten (10) will count. Each laboratory assignment is worth 5% off your final grade (total of 50%).

Exams

- There will be three exams: two mid-terms and the final. Exams will cover material from both lecture and lab (there are no separate lab tests or scheduled lab quizzes).
- Each exam is worth 13% of your grade. The exams are non-cumulative. Exams account for 39% of your semester grade.
- Make-up exams may be given only to those students with medical or personal emergencies who have prior approval from the instructor.

Assessment

Your proficiency in obtaining the learning objectives will be assessed throughout the semester using in-class discussions, examinations, laboratory work, and out-of-class assignments.

Grades

- **Evaluation:**

	<u>Percent</u>
Exams (3 @ 13% ea)	39%
Lab Exercises (10 @ 5% ea)	50%
Attendance and other exercises	11%
Total	100%

- **Final Letter Grades:** Letter grades will be assigned as follows:

Percent	Letter Grade
≥93	A
90-92.9	A-
87-89.9	B+
83-86.9	B
80-82.9	B-
77-79.9	C+
73-76.9	C
70-72.9	C-
67-69.9	D+
63-66.9	D
≤62.9	F

Student Rights and Responsibilities:

- UWSP has guidelines regarding student rights and responsibilities in class and on campus. These are outlined on the Dean of Student's website and in the Student Handbook. Do review these resources if you have not already:
 - <https://www.uwsp.edu/dos/Pages/stu-conduct.aspx>
 - <https://www.uwsp.edu/dos/Pages/stu-academic.aspx>
 - <https://www.uwsp.edu/dos/Pages/handbook.aspx>
 - <https://www.uwsp.edu/dos/Documents/AcademicIntegrityBrochure.pdf>
 - <https://www.uwsp.edu/dos/Documents/UWSP14-Final2019.pdf>

Class Schedule (Tentative)

<u>Date</u>	<u>Class Topic</u>	<u>Reading</u>	<u>Lab Assigned</u>	<u>Lab Due</u>
T 5-Sep	Weather versus climate	Chapter 1, sec 1.4, 1.4a, 1.4c		
R 7-Sep	Atmospheric composition	Chapter 1, sec 1.0-1.3c	Lab Intro	
T 12-Sep	Energy in the atmosphere	Chapter 2, sec 2.0-2.2b		
R 14-Sep	Radiation and Earth's energy balance	Chapter 2, sec 2.3-2.4 (p.43), 2.4c-2.4e	Lab 1 - Energy Balance Models	
T 19-Sep	Controls on Earth's temperature	Chapter 2, sec 2.4a-2.4b		
R 21-Sep	NO LECTURE	Video TBA	NO LAB MEETING - Online Isoline exercise	
T 26-Sep	Seasons and Sun angle	Chapter 3, sec 3.0-3.1b, 3.2, 3.3h-3.4 (p.83)		
R 28-Sep	Latitudinal temperature	Chapter 3, sec 3.3-3.3d, 3.3g	Lab 2 - Sun and Earth Seasons	Lab 1 - Energy Balance Models
T 3-Oct	Water in the atmosphere - humidity	Chapter 4, sec 4.0-4.4e, 4.5c		
R 5-Oct	Evaporation and condensation - fog	Chapter 5, sec 5.0-5.5 cloud video	Lab 3 - Temperature and humidity Part 1	Lab 2 - Sun and Earth Seasons
T 10-Oct	EXAM 1 (Chapters 1-5)			
R 12-Oct	Evaporation and condensation - clouds	Chapter 5, sec 5.6-5.6c	Lab 4 - Temperature and humidity Part 2	Lab 3 - Temperature and humidity Part 1
T 17-Oct	Vertical stability of the atmosphere	Chapter 6, sec 6.0-6.2c		
R 19-Oct	Adiabatic Processes	Chapter 6, sec 6.0-6.2c	Lab 5 - Clouds	Lab 4 - Temperature and humidity Part 2
T 24-Oct	Adiabatic Processes cont'd.	Chapter 6, sec 6.0-6.2c		
R 26-Oct	Lapse rates	Chapter 7, sec 7.0-7.1c	Lab 6 - Lapse rates and temperature	Lab 5 - Clouds
T 31-Oct	Cloud types	Chapter 6, sec 6.3-6.3b		
R 2-Nov	Precipitation formation and types	Chapter 7, sec 7.2-7.2g, 7.3a	Lab 7 - Atmospheric Pressure	Lab 6 - Lapse rates and temperature

<u>Date</u>	<u>Class Topic</u>	<u>Reading</u>	<u>Lab Assigned</u>	<u>Lab Due</u>
T 7-Nov	Air pressure and winds	Chapter 8, sec 8.0-8.2, 8.3-8.4b, 8.4d, 8.4f, 8.5		
R 9-Nov	Air pressure and winds cont'd.	Chapter 8, sec 8.0-8.2, 8.3-8.4b, 8.4d, 8.4f, 8.5	Lab 8 - Isobars and pressure gradient force	Lab 7 - Atmospheric Pressure
T 14-Nov	EXAM 2 (Chapters 6-8)			
R 16-Nov	General circulation	Chapter 10, sec 10.0-10.1d, 10.2-10.2a	Lab 9- Atmospheric Circulation	Lab 8 - Isobars and pressure gradient force
T 21-Nov	Atmosphere-ocean interaction	Chapter 10, sec 10.3-10.3c		
R 23-Nov	THANKSGIVING			
T 28-Nov	Air masses and fronts	Chapter 11, sec 11.0-11.1b, 11.2-11.2e		
R 30-Nov	Natural causes of climate change	Chapter 18, sec 18.0-18.3e	Lab 10 - Tornadoes	Lab 9- Atmospheric Circulation
T 5-Dec	Anthropogenic climate change	Chapter 18, sec 18.4-18.5c		
R 7-Dec	Climate change cont'd.	Chapter 18, sec 18.4-18.5c	Lab 11 - Climate models	Lab 10 - Tornadoes
T 12-Dec	Air pollution and ozone	Chapter 19, sec 19.0 -19.3c		
R 14-Dec	Air pollution and ozone cont'd	Chapter 19, sec 19.0 -19.3c	Lab wrap-up & exam review	Lab 11 - Climate models
R 21-Dec	EXAM 3 (Chapters 10,11,18,19)	10:15AM - 12:15PM		