GEOG 473: ELEMENTS OF WEATHER (4 credits, Discovery PS, DLAB)

Summer Session Term 1, May 20 – June 21, 2024 (ONLINE - asynchronous)

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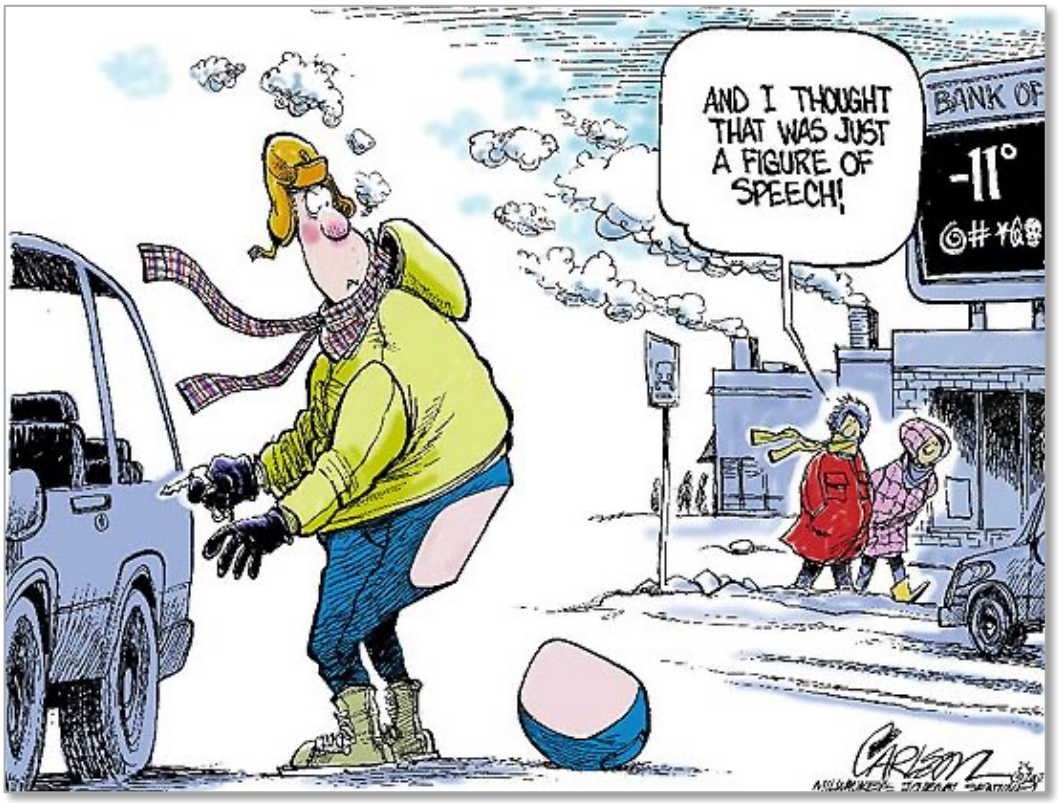
Office Hours: *By appointment*

"… weather was the topic choice used to fill the myriad awkward silences that plagued our daily lives. No other shared experience evoked this kind of elemental empathy. Weather reminded us that we were all in this together, that for all our differences, rich and poor, black and white, zealot and atheist could all agree that yes, last Wednesday was, in fact, cold enough for us".

- EARTH (THE BOOK): A Visitor's Guide to the Human Race*



* Chapter One (Page 16), Grand Central Publishing: New York, NY (2010) – [ISBN: 978-0-446-57922-3]

COURSE DESCRIPTION

Welcome to Elements of Weather!

Elements of Weather is a 4-credit course taught exclusively online. This course is an elective for the Geography and Environmental Science majors and satisfies Discovery Physical Science and Laboratory category requirements.

Description: Few things in nature impact our daily lives as significantly as the instantaneous state of the atmosphere, commonly known as *weather*. *Elements of Weather* is divided into three modules made up of lecture and laboratory material, each culminating in a 60-minute, 40-question, multiple-choice exam. Coursework introduces basic scientific terminology and principles used describe the atmosphere and weather patterns covering:

- Atmospheric composition and flow of energy through the atmosphere (Module One),
- The role of moisture and pressure in the formation of weather systems (Module Two),
- Common North American weather patterns and associated hazards (Module Three).

Objectives: Course materials guide students through the process of scientific inquiry emphasizing knowledge, comprehension, and application of the scientific concepts that describe weather processes. Lecture concepts are reinforced quantitatively and qualitatively through laboratory exercises. Atmospheric processes are modeled quantitatively using basic mathematical (+, -, ×, ÷), trigonometric (sine, cosine etc…), and algebraic operations (fractions and exponents). Patterns in weather data are analyzed qualitatively using graphs, tables, and weather maps. Upon completing the course, students will be able to:

- define the basic meteorological terminology and physical laws that describe weather,
- explain the fundamental physical mechanisms that drive atmospheric motion,
- describe current and likely changes in regional-scale weather patterns.

Online Course Specifics: There are no scheduled classroom or mandatory online appearances, and all course materials are delivered online through UNH myCourses (https://mycourses.unh.edu). Online course content is equivalent to the in-class instruction presented in three, 50-minute lectures and one 2-hour laboratory section per week during a regular 15-week semester. In accordance with the federal definition of a credit hour, plan to spend **20 hours per week** (3-4 hours per weekday) on textbook readings, lecture material, and laboratory assignments. A daily schedule on the last page of the syllabus is provided as a guide to appropriately pace and manage lecture and laboratory coursework. Coursework may be completed and submitted at any point before the listed due dates but following this schedule is highly recommended. Students are expected to be diligent about completing coursework in a timely manner in compliance with all listed due dates and times.

COURSE MATERIALS & RESOURCES

Studies show that students who engage with course material regularly and take hand-written notes perform better on exams than those who do not. I am available to answer course-related questions by email or appointment (via Zoom Video Conferencing) during regular business hours. All communications concerning this course should be conducted in a professional manner.

Lecture and laboratory materials are presented using a combination of Kaltura Lecture Capture recordings, supplemental videos, and web/text resources.

Materials: All course documents, including links to required readings and assignments, are posted in myCourses (https://mycourses.unh.edu) and organized by module. Completion of coursework requires the following materials (refer to the course materials link under "Course Materials" on the course homepage in myCourses for details):

- Textbook – Lutgens, F.K. & E.J. Tarbuck, *The Atmosphere*, 14th Edition (recommended)
  The material presented in lecture is organized into nine lessons covering the first ten chapters of The Atmosphere, 14th Edition by Lutgens and Tarbuck. The recommended textbook may be substituted with an older edition (12th or 13th) or the following free, online texts:
  - NWS *JetStream: Online School for Weather* (http://www.weather.gov/jetstream/)
  - *Fundamentals of Physical Geography* - Chapter 7: Introduction to the Atmosphere (http://www.physicalgeography.net/fundamentals/chapter7.html)
- Supplies – battery-operated scientific calculator (sin, ^, EE etc…)
- Software – PDF viewing (Adobe), word & data processing (Microsoft Office)

Resources: Supporting course material is distributed through the myCourses learning management system (https://mycourses.unh.edu/). Course content is organized as follows:

- Lesson pages (under "Modules") contain (1) a topic outline with daily lectures and assigned readings, (2) detailed reading/lecture outline (Word) with textbook figures from the lecture slides, and (3) links to assignments.
- Laboratory "Assignment" quizzes contain laboratory assignment (1) instructions, (2) Kaltura laboratory lectures, (3) background text, data, and questions. Read the instructions and refer to the background text, laboratory lectures and outline (Word) for example problems.
- The "Quizzes" link provides a list of (1) "assignment quizzes" that includes laboratory assignments and exams, (2) lesson "practice quizzes," and (3) lecture "surveys."

GRADING PROCEDURES

'I do not "take off" points. You earn them … In other words, you start with zero points and earn your way to a grade.' - Art Carden, Contributor, Forbes

The University of New Hampshire expects all students to adhere to its Academic Honesty Policy. The penalties for plagiarism range from an "F" for an assignment to an "F" for a course, or, in some cases, expulsion from the University. All coursework submitted for evaluation in this course must represent each student's own, original work and be completed individually, without collaboration, in accordance with the standards of conduct outlined in the UNH Academic Honesty policy. Turnitin's Simcheck originality tool may be used to check for plagiarism in this course. The UNH plagiarism tutorial provides examples you might find helpful: https://cola.unh.edu/academics/plagiarism-tutorial

Final Grade: Final grades are determined from the weighted total of points earned on **3 exams** (45%), **10 laboratory assignments** (40%), and **class participation** (15%) as follows:

A	≥ 93 %	B+	87 %	B-	80 %	C	73 %	D+	67 %	D-	60 %
A-	90 %	B	83 %	C+	77 %	C-	70 %	D	63 %		

Grades are updated regularly and posted on myCourses under "Grades." Click on the score (links are highlighted in blue) to access instructor feedback on graded coursework. Exam grades may be curved depending upon class performance however **no individual extra credit** will be offered.

I may be reached by UNH email at mary.stampone@unh.edu during regular business hours Monday through Friday to answer questions or schedule a "Zoom" meeting. I am available to meet students individually or in groups via Zoom by appointment.

Participation: Just like attendance in class, participation online is necessary for obtaining and actively engaging with course material. In the online environment, classroom lectures are delivered using Kaltura lecture capture and students are expected to view the lectures and take notes as they would in a classroom setting. Participation is evaluated based on completion of the lecture "**Survey**" located at the bottom of each "Lecture" page. Lecture surveys are **due by 11:59PM the day before the corresponding exam** and together are **worth 15%** of the final grade.

Laboratory: The required laboratory component consists of **10 laboratory assignments**, **together worth 40%** of the final course grade. Each lab assignment is comprised of instruction and lab work equivalent to that assigned in a weekly, 2-hour laboratory section during the regular semester. All lab work must be completed individually without collaboration [UNH Academic Integrity Policy] and submitted through the "Submit" link on the laboratory assignment page.

There is no formal time set aside to complete laboratory assignments, but they must be submitted no later than **12PM-NOON (EDT)** on the due date listed below to receive full credit. Half credit will be given for late lab assignments submitted before 11:59PM (EDT) on the due date. Submitting laboratory assignments before the due date is encouraged. [*Note that the sooner an assignment is submitted, the sooner I can provide feedback*]

- Lab Assignments One through Four: Due by **12PM (NOON) Wednesday, May 29**
- Lab Assignments Five through Seven: Due by **12PM (NOON) Monday, June 10**
- Lab Assignments Eight through Ten: Due by **12PM (NOON) Thursday, June 20**

Exams: There are **3 exams** with 40 multiple-choice questions drawn from the most recent lecture and lab material each worth 15 % of your final grade. Exams have a **60-minute** time limit, are **closed resource**, and must be competed in one attempt. Exams are scheduled every eight business days from the beginning of the semester through the last day. Therefore, there are seven business days to cover lesson material and lab assignments prior to each exam. Exam links are **available between 8AM - 10PM (EDT) on myCourses** on the dates listed below and must be started during the window of availability to receive credit.

- Exam One (*Lessons 1 – 3 and Labs 1 – 4*): Available **8AM to 10PM Thursday, May 30**
- Exam Two (*Lessons 4 – 6 and Labs 5 – 7*): Available **8AM to 10PM Tuesday, June 11**
- Exam Three (*Lessons 7 – 9 and Labs 8 – 10*): Available **8AM to 10PM Friday, June 21**

Technical Support: All the course assignments described above are distributed through the Canvas Learning Management System (LMS) myCourses (https://mycourses.unh.edu). An introduction to myCourses is posted on the course homepage under the "Welcome to myCourses" link. Please review the list of the minimum technical requirements under "Which browsers do Canvas support" and update your web browser and all required graphics software (Flash, Java etc…) as necessary. The Canvas Help Center provides 24-hour support by clicking on the "?" button in the lower left corner. Contact the UNH IT/Service Desk at (603) 862-4242 (M-F from 7:30am – 5:00pm EST) or email questions for technical support concerning UNH supported online learning software and tools.

UNIVERSITY POLICIES & STUDENT RESPONSIBILITIES

All students must understand university policies and procedures regarding academic performance outlined in the UNH Student Rights, Rules, and Responsibilities [https://catalog.unh.edu/srrr/]. Refer to the Undergraduate Academic Catalog section on Attendance and SRRR Section II Prohibited Academic Conduct for University policies on absences, classroom requirements, and standards of conduct. Links to additional resources and services are provided under "Policies" in myCourses.

The University of New Hampshire is a public institution with a long-standing commitment to equal opportunity for all. UNH does not discriminate based on race, color, religion, sex, age, national origin, sexual orientation, gender identity and expression, disability, veterans' status, or marital status, in access to, or treatment in, its programs, activities or services.

Communication: To ensure a climate of learning for all, disruptive or inappropriate behavior online may result in removal from this class. All forms of communication directed toward instructors and classmates must be conducted in a professional manner. Address emails appropriately, include your name, and use proper English. Additionally, students are required to abide by all "netiquette" guidelines when using online communication tools with your classmates and instructors [https://td.unh.edu/TDClient/60/Portal/KB/ArticleDet?ID=2406].

Procedures, policies, and schedules may change during the course semester. Changes are posted on myCourses under "Announcements" and may also be distributed via email. It is your responsibility to **check your university email account and the course homepage on myCourses regularly** (recommended daily).

Accessibility: In accordance with the Americans with Disabilities Act (2008), students with a documented disability requiring accommodations may request one for this course through Student Accessibility Services (SAS). Accommodation letters are created by SAS with the student but follow-up with the instructor to ensure timely implementation of the identified accommodations. Faculty are obligated to respond to an official SAS notice of a disability but are under no obligation to provide retroactive accommodations. Refer to http://www.unh.edu/studentaccessibility or contact Student Accessibility Services at 603-862-2607 or sas.office@unh.edu for more information.

Your academic success and overall mental health is important. If you are experiencing emotional or mental health issues, contact the UNH Psychological and Counseling Services (PACS) [**3rd floor, Smith Hall; 603 862-2090/TTY: 7-1-1**], for counseling appointments and other mental health services. If urgent, students may call PACS M-F, 8 a.m. – 5 p.m., and schedule and Urgent Same-Day Appointment.

Student Support Services: A full list of academic support services is available through the UNH "Students" directory.

COURSE SCHEDULE

Date*	Lesson**	Laboratory Assignment
May 20 (Mon)	**1.1**: Weather Elements (Ch. 1.1-2 & 12.2)	**Lab 1**: Weather Measure & Symbols
May 21 (Tue)	**1.2**: Atmospheric Structure (Ch. 1.4-5)	**Lab 2**: Atmospheric Structure
May 22 (Wed)	**2.1A**: Earth-Sun Relationship (Ch. 2.1)	
May 23 (Thurs)	**2.1B**: Incoming Solar Radiation (Ch. 2.1)	**Lab 3**: Surface Radiation Balance
May 24 (Fri)	**2.2**: Net Radiation (Ch. 2.2-6)	
May 28 (Tue)	**3.1**: Temperature Controls (Ch. 3.1, 3.3, 3.5-6)	**Lab 4**: Controls on Temperature
May 29 (Wed)	**Laboratory Exercises 1-4 Due by 12PM (noon), May 29**	
	3.2: Temperature Patterns (Ch. 3.2 & 3.4)	
	Lesson Lecture Surveys for Lessons 1-3 Due 11:59PM, May 29	
May 30 (Thurs)	**Exam One: Lessons 1 through 3 - *Available 8AM to 10PM***	
May 31 (Fri)	**4.1**: Atmospheric Moisture (Ch. 4.1-5)	
June 3 (Mon)	**4.2**: Atmospheric Stability (Ch. 4.6-8)	**Lab 5**: Humidity and Stability
June 4 (Tue)	**5.1**: Clouds & Fog (Ch. 5.1-3)	
June 5 (Wed)	**5.2**: Precipitation (Ch. 5.4-6)	**Lab 6**: Precipitation
June 6 (Thurs)	**6.1**: Atmospheric Pressure (Ch. 6.1-2)	
June 7 (Fri)	**6.2**: Wind (Ch. 6.3-6)	**Lab 7**: Atmospheric Circulation
June 10 (Mon)	**Laboratory Exercises 5-7 Due 12PM (noon), June 10**	
	6.3: Global Circulation (Ch. 7.3-4)	
	Lesson Lecture Surveys for Lessons 4-6 Due 11:59PM, June 10	
June 11 (Tue)	**Exam Two: Lessons 4 through 6 - *Available 8AM to 10PM***	
June 12(Wed)	**7.1**: Air Masses (Ch. 8.1-4)	
June 13 (Thurs)	**7.2**: Fronts (Ch. 9.1,7)	**Lab 8**: Air Masses and Fronts
June 14 (Fri)	**8.1**: Mid-Latitude Cyclones (Ch. 9.2-4 & 9.6)	
June 17 (Mon)	**8.2**: U.S. Weather Patterns (Ch. 9.5-6)	**Lab 9**: Mid-Latitude Weather
June 18 (Tue)	**9.1**: Thunderstorms (Ch. 10.1-3)	**Lab 10**: Severe Weather
June 20 (Thurs)	**Laboratory Exercises 8-10 Due 12PM (noon), June 20**	
	9.2: Thunderstorm Hazards (Ch. 10.4-8)	
	Lesson Lecture Surveys for Lessons 7-9 Due 11:59PM, June 20	
June 21 (Fri)	**Exam Three: Lessons 7 through 9 - *Available 8AM to 10PM***	

*NOTE: All times are given in Eastern Daylight Time (EDT)

** Lesson readings correspond to chapter sections in the textbook by Lutgens & Tarbuck