

# APPLIED CLIMATOLOGY

ATMS-420

Spring 2024

## Course Description:

Changes in the climate can have large impacts on many sectors of our life and the magnitude of impacts can be widely varied. Understanding how changes in the climate threaten community assets help local and state governments plan adaptation measures to increase climate resilience. In this course you will learn how to apply climatological and statistical principles to weather-sensitive fields such as agriculture, construction, transportation, and energy conservation.

**Class Meetings:** TuTh 8:15–9:30 a.m. in RRO 238

**Prerequisite:** ATMS-405

**Credit hours:** 3

## Professor

Dr. Caitlin Crossett

**Office:** RRO 251

**Phone:** 828.250.3888

**Email:** [ccrosset@unca.edu](mailto:ccrosset@unca.edu)

**Office Hours:** M and Th: 10–11a.m.

W: 1–2p.m. or by appointment

## GENERAL INFORMATION

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**Webpage:** The course webpage (Moodle) is referenced throughout the course and students are encouraged to access it regularly. Lecture slides, announcements, assignments, and sources of additional information will be made available on a regular basis.

Visit <http://www.atms.unca.edu/slos.shtml> for a list of the student learning outcomes for the Department of Atmospheric Sciences.

## ASSIGNMENTS

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**Homework:** Four homework sets will be assigned throughout the semester and are designed to meet a specific aim of your final project. It is therefore in your best interest to put significant time and effort into these homework assignments so that your final project comes together as seamlessly as possible.

**Final Project/ Presentation:** You will each be tasked with creating a climate action plan that describes observed and future climate of a U.S. city of your choice. You will also explore how the changes to that climate impact sectors of importance such as, agriculture, transportation, and how climate changes and their impacts might trickle down to changing climate risks for people living in that city. More information on this project will be provided on a separate handout.

Course Work	% of Grade
Homework	75%
Final Paper & Presentation	25%

A	92–100	C	72.0–77.9
A-	90.0–91.9	C-	70.0–71.9
B+	88.0–89.9	D+	68.0–69.9
B	82.0–87.9	D	60.0–67.9
B-	80.0–81.9	F	< 60.0
C+	78.0–79.9		

## EXPECTATIONS/ COURSE POLICIES

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**Late Work:** I will accept late work for a 10% per day penalty. You will be allowed one 48-hour extension on one outside of class assignment (except of the final project) for no penalty. You must clear this extension with me no less than 24-hours before the due date.

**Academic Honesty:** Any act of plagiarism, cheating, or use of unauthorized material or assistance is academic dishonesty. A person who knowingly assists another in cheating is likewise guilty of cheating. It is up to my assessment of the gravity of the offense, that a student may be punished by a failing grade or a grade of zero for the assignment or test, or a failing grade in the course. I expect that you will exercise integrity in all quizzes, exams, and written assignments. Please email me or come in during office hours if you have additional questions or need clarification on any point.

**Attendance:** There is no attendance policy for this course, but your success in this course is undoubtedly tied to attending lectures regularly and keeping up with course content. Please come to class on time. Each class will start and end on time. If you need to arrive late, be respectful of others when you enter the classroom and find a seat. If you must leave early, please let me know before class and leave as quietly as possible so as not to disturb the class.

**Technology Use:** You may use laptops or tablets during class to take notes, but you may not use them for watching TV, doing work for other classes, or anything else not related to course discussion. I reserve the right to change this policy should distractions become an issue. If you have accommodations through the Office of Academic Accessibility ([accessibility.unca.edu](http://accessibility.unca.edu)) for electronics use during class, please come talk to me.

**Artificial Intelligence Tools Policy:** Using an AI-content generator such as ChatGPT to complete assignments without proper attribution violates academic integrity. By submitting assignments in this class, you pledge to affirm that they are your own work and you attribute use of any tools and sources (guides to citing AI tools can be found [here](#)). Approved uses of ChatGPT are limited to: Brainstorming ideas, fine tuning research questions, assistance with coding (i.e., finding bugs), and locating supporting information such as journal articles and web pages. If you are unsure if a specific use of ChatGPT is approved, please email, or come talk to me.

**Communication:** I will primarily contact you about course information through email or our course website (Moodle) so please get in the habit of checking both every day. Therefore, email is also the best way to reach me with any questions/comments/concerns ([ccrosset@unca.edu](mailto:ccrosset@unca.edu)). I will monitor email from 8a.m.–5p.m. during the work week and intermittently outside of these hours and during the weekend. Please allow me 24 hours to reply to your email and please make sure you've

consulted the syllabus and our course website before asking a question whose answer might be on either.

**Respectful Classroom Environment:** It is expected that you will be respectful of other students, the instructor, and any guest presenters while in class. Just as you expect others to actively listen to your diverse set of thoughts and perspectives, I ask that you do the same. Any disrespectful or disruptive behavior will not be tolerated, and you will be asked to leave class. If something is shared in class (by anyone, including myself) that makes you feel uncomfortable, please let me know.

## **UNIVERSITY RESOURCES**

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**Accessibility:** UNC-Asheville values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to this class should let the professor know, and/or make an appointment to meet with the Office of Academic Accessibility as soon as possible. To make an appointment, call 828.232.5050 or email [academicaccess@unca.edu](mailto:academicaccess@unca.edu). Learn more about the process of registering, and the services available through the Office of Academic Accessibility here: [accessibility.unca.edu](https://www.unca.edu/accessibility)

**Mental Health Support:** As a student, you may experience a range of challenges that can interfere with learning, such as stressful life events, experiences of anxiety and/or depression, self-harm, substance use, and/or unusual difficulty with ordinary life activities. The increased stress of school can also make existing mental health struggles more difficult to manage. Support is available and treatment can help. Learn more about the confidential mental health services UNC Asheville provides to support student success at <https://www.unca.edu/life/health-counseling/>. The Health and Counseling Center is located at 118 W.T. Weaver Boulevard. Appointments can be made by calling 828-251-6520. A UNC Asheville counselor on call is available after 5 p.m. and on weekends; the counselor on call can be accessed by calling the UNCA Campus Police dispatcher at 828-251-6710. Additionally available after hours and on weekends, call the Bulldog Health Link at 1-888-267-3675, where you can get immediate support for mental health, medical consultation, concern for a friend, and/or community resources. In case of an emergency, you can also call RHA's Mental Health Mobile Crisis Unit at 1-888-573-1006.

**COURSE SCHEDULE (subject to change) – ATMS-420 – Spring 2024**

Week	Date	Topic	Assignment
1	16-Jan	Introduction to Applied Climatology	
	18-Jan	Observational Data: In-Situ	
2	23-Jan	Observational Data: Reanalyses	<b>Pick City for Climate Action Plan</b>
	25-Jan	Observational Data: Other Useful Datasets	
3	30-Jan	Prof. Crossett at AMS Meeting - NO Class	<b>Outline for Climate Action Plan</b>
	1-Feb	Prof. Crossett at AMS Meeting - NO Class	<b>Steps to Resilience</b>
4	6-Feb	Observational Data: Basic Analysis Techniques	
	8-Feb	Observational Data: Basic Analysis Techniques	
5	13-Feb	Synoptic Analyses: Map Plotting	
	15-Feb	Synoptic Analyses: Composites/ Standardized Anomalies	
6	20-Feb	Synoptic Analyses: Clustering Techniques	<b>HW1: Past climate</b>
	22-Feb	Synoptic Analyses: Principal Components Analysis	
7	27-Feb	Future Climate	
	29-Feb	Future Climate	
8	5-Mar	Future Climate	
	7-Mar	Future Climate	<b>HW2: Synoptic Analyses</b>
9	12-Mar	Spring Break - NO Class	
	14-Mar	Spring Break - NO Class	
10	19-Mar	Climate Risk Assessment	
	21-Mar	Climate Risk Assessment	
11	26-Mar	Climate Risk Assessment	
	28-Mar	Climate Risk Assessment	<b>HW3: Future Climate</b>
12	2-Apr	Sector Analysis: Agriculture	
	4-Apr	Sector Analysis: Human Health, <i>Guest Lecture Dr. Augusta Williams</i> , SUNY Upstate Medical University	
13	9-Apr	Sector Analysis: Renewable Energy	
	11-Apr	Sector Analysis: Transportation	
14	16-Apr	Risk/ Uncertainty Communication	
	18-Apr	Final Project Work Day	<b>HW4: Risk Assessment</b>
15	23-Apr	Undergraduate Research Symposium - NO Class	
	25-Apr	Final Project Work Day	
16	30-Apr	Final Project Work Day	
<b>Thursday</b>	<b>2-May</b>	<b>Final Presentations: 8:00 - 10:30a.m.</b>	