WEATHER FORECASTING
ATMS-350
Spring 2026

Course Description:
This course will cover atmospheric science principles important to forecasting the weather. You will learn how to interpret and analyze weather data from surface observations, satellite, and radar imagery, and numerical weather models. A crucial part of this course is participating in daily map discussions as we practice applying course concepts to the "real world".

Class Meetings: TuTh 8:15–9:30a.m. in RRO 238
Prerequisites: ATMS-203
Credit hours: 3

Professor

Dr. Caitlin Cook

Office: RRO 251
Phone: 828.250.3888
Email: ccrosset@unca.edu

Office Hours: M–W 1–2 p.m. or by appointment:
https://calendly.com/ccrosset

GENERAL INFORMATION

Optional Textbook: Vasquez, T., 2021: *Weather Analysis & Forecasting Handbook*. 2nd ed. Weather Graphics Technologies, 340 pp. (ISBN-13: 9780996942348).

Webpage: The course page on Moodle will provide lecture slides, announcements, assignments, and sources of additional information. Please get in the habit of checking it frequently.

Student Learning Outcomes:
1. Interpret meteorological data associated with historic and real-time case studies in writing and as a part of regular map discussions
2. Create and interpret hand drawn surface and upper-air maps and skew-T log p diagrams
3. Generate weather forecasts for the WxChallenge and map discussions using relevant meteorological data

ASSIGNMENTS

Attendance: Your success in this course is undoubtedly tied to attending lectures regularly and keeping up with course content. Please come to class on time as each class will start and end on time. If you need to arrive late or leave early, please let me know before class and enter or exit quietly so as not to disturb the class. Arriving more than 10-minutes late to class will result in a zero for attendance for that day. Your two lowest attendance scores will be dropped.

Homework: Homework questions will relate principles learned in class to different circumstances to build mastery of course material. You are encouraged to work with other students on homework, but you must turn in your own work. Even if you don't get the correct answer, you will get partial credit for showing your work.

Map Discussion: To get better at understanding the weather we must practice analyzing it! Three times throughout the semester each student (once in a group and twice as an individual) will lead a short map discussion. A successful map discussion requires that there be a conversation among peers regarding something interesting going on in the atmosphere. Participation in each map discussion is crucial for everyone's understanding and will be incorporated into your grade.

WxChallenge Participation: Your participation in the WxChallenge forecast competition provides you the unique experience to practice forecasting for locations around the U.S. and get actual feedback on those forecasts! You will be graded on forecast completion and will receive bonus points towards exam grades for top ten finishes in each city.

Forecast Journal: Due at 11:59p.m. the day before each map discussion you lead (three in total) you will be required to submit your temperature, wind speed, and precipitation forecasts for the WxChallenge forecast city. You will also be required to justify your forecast. More information will be provided on a separate handout. Your lowest forecast journal score will be dropped.

Exams: Two exams, a midterm and a final, will be given in this course. You are expected to take the exams during the scheduled time unless other accommodations (i.e., University sponsored events, religious observances, etc.) have been cleared through me before the exam.

Course Work	% of Grade
Attendance	5%
Homework	40%
Map Discussions	15%
Forecast Journal	5%
WxChallenge Participation	5%
Midterm Exam	15%
Final Exam	15%

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

Late Work: I will accept late work for a 10% per day late penalty. **LIFE TOKEN: You will be allowed one 48-hour extension on one homework assignment or map discussion journal 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.

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) 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 AI-content generators 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 an AI-content generator is approved, please email, or come talk to me.

Communication: I will primarily contact you about course information through email or 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). I will monitor email from 8a.m.–5p.m. during the work week and intermittently outside of these hours and during the weekend.

Respectful Classroom Environment: I ask that everyone 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.

UNIVERSITY RESOURCES

Accessibility: UNC Asheville is committed to providing accessible learning environments and equal opportunity to individuals with disabilities in accordance with the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act. If you are a student experiencing barriers to access or full participation in this course on the basis of a disability, contact the Office of Accessibility (OA) to apply for reasonable accommodations and discuss available resources. You may contact the OA at academicaccess@unca.edu or 828-251-6292 or visit Zageir Hall Room 120. To discuss approved academic accommodations, please contact me as early in the semester as possible and provide your letter of accommodation (LOA) from the OA. I want to ensure that we have adequate time and a confidential setting to discuss and arrange your approved accommodations. Accommodations are not retroactive and will be implemented when the LOA is discussed.

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 350 – Spring 2026

Assignments are due on the dates listed unless otherwise noted.

Week	Date	Topic	Map Discussion Leader(s)	Assignment
1	13-Jan	Introduction		
	15-Jan	Forecast Process	CC	**Sign up for WxChallenge**
2	20-Jan	Moisture Variables, METAR, Surface Stations Review	CC	
	22-Jan	Moisture Variables, METAR, Surface Stations Review	CC	
3	27-Jan	Skew-T Log-P Charts	Shevchenko & Walters	**HW1**
	29-Jan	Skew-T Log-P Charts	West & Jones	
4	3-Feb	Precipitation Type Forecasting	Zeidell & Wiest	**Sign up for Individual Discussions**
	5-Feb	Precipitation Type Forecasting	Cabral, Edwards, & Miguelez	
5	10-Feb	Surface and Upper-Air Map Analysis and Interpretation	Student 1	**HW2**
	12-Feb	Surface and Upper-Air Map Analysis and Interpretation	Student 2	
6	17-Feb	Surface and Upper-Air Map Analysis and Interpretation	Student 3	
	19-Feb	Surface and Upper-Air Map Analysis and Interpretation	Student 4	
7	24-Feb	Extratropical Cyclones	Student 5	
	26-Feb	Extratropical Cyclones	Student 6	**HW3**
8	3-Mar	Numerical Models	Student 7	
	5-Mar	**Exam #1**		
9	10-Mar	**Spring Break - No CLASS**		
	12-Mar	**Spring Break - No CLASS**		
10	17-Mar	Ensemble Forecasting	Student 8	
	19-Mar	Ensemble Forecasting	Student 9	
11	24-Mar	Model Output Statistics (MOS)	Student 1	
	26-Mar	Forecast Verification	Student 2	**HW4**
12	31-Mar	Forecast Verification	Student 3	
	2-Apr	Winter Weather Forecasting	Student 4	
13	7-Apr	Winter Weather Forecasting	Student 5	
	9-Apr	***Guest Lecture from Thomas Winesett - NWS GSP***		**HW5**
14	14-Apr	Severe Weather Forecasting	Student 6	
	16-Apr	Severe Weather Forecasting	Student 7	
15	21-Apr	**UG Research Symposium - No CLASS**		
	23-Apr	Severe Weather Forecasting	Student 8	
16	28-Apr	Severe Weather Forecasting	Student 9	**HW6**
Thursday	**30-Apr**	**8:00-10:30a.m.: Exam 2**		