

Syllabus for ATMS 265 – Mountain Meteorology – Spring 2025

Date	Topic	Reading/Homework*
M 13 Jan 2025	Introduction/ Overview	Chapters 3-6, 9
W 15 Jan	Background	Lecture notes
M 20 Jan	<i>MLK Jr. holiday</i>	<i>No classes</i>
W 22 Jan	Mountain Climates	Chapters 1, 2
M 27 Jan	"	
W 29 Jan	"	Quiz#1 , TH#1 due
M 3 Feb	Clouds and Fogs	Chapter 7
W 5 Feb	"	TH#2 due
M 10 Feb	"	Quiz#2
W 12 Feb	Precipitation	Chapter 8 (8.1-8.6)
M 17 Feb	"	
W 19 Feb	"	TH#3 due
M 24 Feb	"	
W 26 Feb	"	Quiz#3
M 3 Mar	Reports, Round#1	Presentation#1 due
W 5 Mar	Lecture/Review	
M 17 Mar	Exam I	13 Jan – 5 Mar material
W 19 Mar	Field trip	Haywood County, NC
M 24 Mar	Terrain-Forced Flows	Chapter 10
W 26 Mar	"	
M 31 Mar	"	
W 2 Apr	"	TH#4 due
M 7 Apr	"	
W 9 Apr	"	TH#5 due
M 14 Apr	"	Quiz#4
W 16 Apr	Diurnal Mountain Winds	Section 8.7, Chapter 11
M 21 Apr	"	TH#6 due
W 23 Apr	"	Quiz#5
M 28 Apr	Reports, Round#2, Lecture/Review	Presentation#2 due
Final Exam Week	Exam II	24 Mar – 28 Apr material

*assignment completed before class meets on this date

Description

"I think there is a lesson for not only Asheville but other surrounding towns to learn from Boone as well. True, they get more snow than just about anyone in WNC..."

A quote from the AC-T web site commenting on a recent snowstorm impacting western North Carolina. It reflects the often-localized nature of weather for those living in close proximity of mountains, making precise forecasts a difficult proposition. This course is intended to give the student an appreciation of how mountain ranges can modulate the large-scale weather and we'll examine several cool and warm season scenarios in which this modulation occurs. An outcome of this course is for the student to (**Student Learning Outcomes**)

- understand how adjustments to a local weather forecast might need to be made when meso- and synoptic-scale atmospheric disturbances interact with mountains

- inspire a curiosity about the natural world that motivates the student to continue their learning about mountain meteorology beyond this course
- develop an ability to make a significant contribution to a team-based research effort

Outline

Introduction (Chapters 3-6, 9)
 Overview of course
 Background information
 A branch of mesoscale meteorology
 Mountain climates (Chapters 1, 2)
 Lee cyclogenesis (Article 1)
 Clouds and fogs (Chapter 7)
 Precipitation (Chapter 8, Sections 8.1-8.6)
 Cool season orographic storms (MetEd Link 1)
 Impact on fronts (Article 2)
 NW flow snow (Article 3)
 Terrain forced flows (Chapter 10, MetEd Link 2)
 Mountain waves (MetEd Link 3)
 Windstorms (MetEd Link 3)
 Gap flows (MetEd Link 4)
 Barrier jet (MetEd Link 5)
 Cold air damming (MetEd Link 6)
 Coastal jet (MetEd Link 7)
 Coastally-trapped wind reversals (MetEd Link 8)
 Diurnal mountain winds (Chapter 8; Section 8.7, Chapter 11)
 Impact on convection (Article 4)
 Impact on tornadoes (Article 5)

Grading

Treasure Hunts	10%
Quizzes	10%
MountainWx [2]	10%
Exam I	20%
Exam II	20%
Reports [2]	30%
Total	100%

92% < total score ≤ 100%	A
90% < total score ≤ 92%	A-
88% < total score ≤ 90%	B+
82% < total score ≤ 88%	B
80% < total score ≤ 82%	B-
78% < total score ≤ 80%	C+
72% < total score ≤ 78%	C
70% < total score ≤ 72%	C-
68% < total score ≤ 70%	D+
60% < total score ≤ 68%	D
total score ≤ 60%	F

Treasure Hunts

Occasional assignments to make certain that you have been discovering the “golden nuggets” from your reading and MetEd web assignments. The Treasure Hunts will prepare you for quizzes and mid-terms by highlighting key points of the various mountain meteorology topics.

Quizzes

Quizzes will be given at the conclusion of each unit, for a total of five. Quizzes are given to help the student gauge their understanding of the material from the assigned reading and MetEd (COMET) modules. The lowest quiz score will be *dropped* and not count toward the final course grade.

MountainWx

Each student will have two opportunities during the semester to find a significant mountain-influenced past weather event and present the case study to the class. The presentation should be no longer than **FIVE** minutes and should consist of a synoptic discussion (SLP, 850 or 700, 500, and 300 hPa maps), show image loops (radar and/or satellite), and discuss how mountain effects might have played a role in the weather event. The MountainWx presentations will take place regularly at the beginning of each non-exam class period.

Exams I and II

The mid-term exams (I and II) will be primarily testing new material introduced since the previous exam or since the start of the semester. Exam II will be taken during Final Exams week and will test the material given during the second half of the semester.

Reports

Each student will have two opportunities to be part of a research team responsible for reporting on an extreme weather event related to mountain meteorology that had a significant societal impact (e.g. lives and property threatened). There are two options for these projects [a] a presentation that reports the findings contained in a published AMS journal article describing the extreme mountain meteorology event, or [b] a presentation that reports on your own personal research related to an extreme mountain meteorology event. The “deliverables” for either type of report are a 20 minute oral presentation in the classroom and a one-page study guide that describes the **MOST IMPORTANT** results of the research project. Information from the study guide will be testable material on the mid-term exams and will be shared with all students in the class.

Report option [b] will have the additional required deliverable of a type-written double-spaced paper *at least* seven pages long in which at least three primary references have been utilized in gathering the report information. Wikipedia does not count as a reference.

Assignment/Quiz/Exam Policy

Assignments are to be handed in before the start of lecture on the date they are due. Assignments handed in after the start of lecture are considered late until 4:00 pm on the date they are due and will have an automatic 10% deduction from their final score. Assignments handed in after 4:00 pm on the date they are due will receive no credit.

Quizzes and Exams are written tests and will be taken on the date they are scheduled, unless circumstances (e.g. medical or loss in the family) warrant. Make-up quizzes and exams for unexcused absences will consist of an individual oral graded question and answer session at a mutually agreed upon time outside of the usual class meeting time.

Instructor

Doug Miller [http://www.atms.unca.edu/dmiller/
dmiller@unca.edu](http://www.atms.unca.edu/dmiller/dmiller@unca.edu)

Textbook

“Mountain Meteorology, Fundamentals and Applications” by C. David Whiteman

COMET (MetEd) modules related to Mountain Meteorology (see lecture packets for web site locations)

Five articles on Moodle at “Atmospheric Sciences 265.001: Mountain Meteorology” (<http://learnonline.unca.edu/>)

Reference

“Atmospheric Processes over Complex Terrain” Edited by William Blumen

(continued)

Office of Accessibility & Academic Accommodations

UNC Asheville is committed to providing an inclusive experience, 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 to apply for reasonable accommodations and discuss available resources. You may contact the Office of Accessibility at academicaccess@unca.edu or 828-251-6292.

Students are responsible for discussing their Letter of Accommodations (LOA) with their faculty. Students and faculty are encouraged to discuss the LOA as early in the semester as possible to allow for extended access to accommodations. However, students may disclose a disability at any point in the semester. Accommodations are not retroactive and are activated when the LOA is discussed.

Sexual Harassment and Misconduct

UNC Asheville is dedicated to cultivating and maintaining a safe, respectful, and inclusive environment, free from harassment and discrimination. We strive to ensure that all have equal access to the educational and employment opportunities the University provides. If you or someone you know has been affected by sexual or gender-based harassment, including sexual assault, dating or domestic violence, or stalking, please know that help and support are available. UNC Asheville strongly encourages all members of the community to take action, seek support, and report incidents of sexual harassment to the Title IX Office. You may contact the Title IX Office or Heather Lindkvist, the Title IX Coordinator, directly at 828.232.5658 or at titleix@unca.edu or learn more by visiting titleix.unca.edu.

As a faculty member, I am a “responsible employee” and private resource. This means that if you share any information or discuss an incident with me regarding sexual or gender-based harassment, I must disclose this information to the Title IX Coordinator. Our goal is to ensure you are aware of the range of options available to you and have access to the resources you may need.

If you wish to speak with a confidential resource, contact University Health and Counseling Services at 828.251.6520. Off-campus confidential resources include Our Voice (24-Hour Hotline at 828.255.7576) and Helpmate (24-Hour Hotline at 828.254.0516).

Academic Alerts

Faculty at UNC Asheville have access to an Academic Alert system. The purpose of this system is to communicate with students about their progress in courses. Alerts can indicate concerns (e.g., academic difficulty, attendance problems) or reflect on the good work you’re doing. Professors use the Alert system because they are invested in student success and want to encourage open conversations about how students can improve their performance. When a faculty member submits an alert that expresses a concern, the student receives an email from Academic Advising notifying them of the alert. If a student receives three or more alerts, they will need to meet with a Student Success Specialist in the Academic Success Center. The instructor may also request to meet with the student to discuss the alert. It is in the student's best interest to address the alert quickly, as students who do so are more likely to earn credit for the course. Questions about the Academic Alert system can be directed to Anne Marie Roberts (amrober1@unca.edu) in the Academic Success Center.

University Writing Center

The University Writing Center (UWC) supports writers in one-on-one sessions lasting 10 to 45 minutes. Consultants can help writers organize ideas, document sources, and revise prose. If you visit the UWC, bring a copy of your assignment, any writing or notes you may have, and the sources you are working with. Make an appointment by visiting writingcenter.unca.edu and clicking on "Schedule an Appointment," or drop in during open hours Monday-Friday.

Academic Honesty

The university's policy on academic honesty states that "As a community of scholars dedicated to learning and the pursuit of knowledge UNC Asheville relies on the honesty and academic integrity of all the members of its community. Any act of plagiarism or cheating is academic dishonesty. A person who knowingly assists another in cheating is likewise guilty of cheating. According to the instructor's view of the gravity of the offense, 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. If it seems warranted, the instructor may also recommend to the Provost dismissal or other serious university sanction." I expect that you will exercise integrity in all quizzes, exams, and written assignments. Please email me or pop in during student hours if you have additional questions or need clarification on any point.