

Syllabus for ATMS 316 – Mesoscale Meteorology – Fall 2021

Date	Topic	Reading/Homework*
T 17 Aug 2021	Introduction/ Overview	
R 19 Aug	What is the Mesoscale?	Chapter 1
T 24 Aug	Lake-effect convection	Chapter 4
R 26 Aug	“	Quiz #1
T 31 Aug	Northwest flow snowfall	Miller (2012), Project#1 due
R 2 Sep	“	Quiz #2
T 7 Sep	Polar lows	Nordeng & Rasmussen (1992)
R 9 Sep	“	Quiz #3
T 14 Sep	Synoptic fronts	Chapter 5, Project#2 due
R 16 Sep	“	Quiz #4
T 21 Sep	Mesoscale Gravity Waves	Chapter 6
R 23 Sep	“	Quiz #5
T 28 Sep	Presentations, Round#1	Presentation#1 due
R 30 Sep	“	Project#3 due
R 7 Oct	Lecture/Review	
T 12 Oct	Exam I	17 Aug – 7 Oct material
R 14 Oct	Mountain Waves and Downslope Windstorms	Chapter 12
T 19 Oct	“	Quiz #6
R 21 Oct	Drylines and outflow boundaries	Chapter 5
T 26 Oct	“	Quiz #7
R 28 Oct	Convection Initiation	Chapter 7
T 2 Nov	“	Quiz #8, Project#4 due
R 4 Nov	Organization of Isolated Convection	Chapter 8
T 9 Nov	“	Quiz #9
R 11 Nov	Mesoscale Convective Systems	Chapter 9
T 16 Nov	“Hazards Associated with Deep Moist Convection	Chapter 10
R 18 Nov	“	Quiz #10, Project#5 due
T 23 Nov	<i>Undergraduate Research Day</i>	<i>no classes</i>
T 30 Nov	Presentations, Round#2	Presentation#2 due
Final Exam Period	Exam II	14 Oct – 30 Nov material

*assignment completed before class meets on this date

Description

“The devil is in the details.”

A quote intended to convey the importance of paying attention to the details. The saying can be applied in our career as a weather forecaster. If we have an understanding of the large scale (synoptic-scale) weather, but ignore how local effects can modulate the large-scale weather, we will find ourselves making a bad local weather forecast. The local

Description (continued)

weather effects quite often fall under the general category of “Mesoscale Meteorology.” This course is intended to give the student an appreciation of how middle-scale (mesoscale) effects can modulate the large-scale weather and we’ll examine several specific scenarios in which this modulation occurs. An outcome of this course is for the student to consider how adjustments to a local weather forecast might need to be made when impacted by mesoscale effects.

Outline

- Introduction - Overview of course
- What is the Mesoscale? {Chapter 1}
- Lake-effect convection {Chapter 4, p. 93 – 103}
- Northwest flow snowfall {Miller (2012) Weather and Forecasting article}
- Polar lows {Nordeng and Rasmussen (1992) Tellus article}
- Synoptic fronts {Chapter 5, p. 117 – 132}
- Mesoscale Gravity Waves {Chapter 6, p. 161 – 175}
- Mountain Waves and Downslope Windstorms {Chapter 12, p. 327 – 342}
- Drylines and outflow boundaries {Chapter 5, p. 132 – 149}
- Convection Initiation {Chapter 7, p. 183 – 199}
- Organization of Isolated Convection {Chapter 8, p. 201 – 224}
- Mesoscale Convective Systems {Chapter 9, p. 245 – 249}
- Hazards Associated with Deep Moist Convection {Chap 10, p. 273 – 306}

Grading

Projects	10%
Quizzes	10%
MesoNews	5%
Exam I	20%
Exam II	20%
Presentation #1	15%
Presentation #2	20%
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

Projects

Projects will be assigned throughout the semester and are intended to aid in improving your understanding of the course material contained in the lecture and reading assignments. Projects will be defined as *individual* or *group* assignments. When an assignment is designated for a *group*, each individual within the group will receive an identical grade.

Quizzes

Quizzes will be given weekly, at the end of the class period on Thursdays during those weeks when we are discussing new material. Quizzes are given to help the student gauge their understanding of the weekly material from the assigned paper or textbook reading. The lowest quiz score will be *dropped* and not count toward the final course grade.

MesoNews

Each student will have one opportunity during the semester to find a significant mesoscale-influenced weather event over the past week 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, 700, 500, and 300 mb maps), show image loops (radar and/or satellite), and discuss how mesoscale effects might have played a role in the weather event. The MesoNews presentations will take place at the beginning of class on Tuesdays.

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 presented during the second half of the semester.

Presentations

Each student will have two opportunities for finding a published journal article within the past 10 years (2011 – present) that cites references contained in the “Further reading” sections of the textbook or cites one of the papers read in this course and present the important information from the recent article during a 10 minute oral presentation. A one-page study guide will also be a requirement which describes the MOST IMPORTANT findings of the paper. The information from this study guide will be testable material on the mid-term exams and will be shared with all students in the class.

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 4:30 pm on the date they are due and will have an automatic 10% deduction from their final score. Assignments handed in after 4:30 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.

Student Learning Outcomes

- Understand the uniqueness of cool and warm season mesoscale weather phenomena in terms of the forces and accelerations contributing to their evolution
 - Utilize this understanding to predict how these phenomena can modulate weather patterns on the synoptic scale
 - Refine research and communication skills in the preparation of oral presentations of two published journal articles
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Instructor

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Textbook

“Mesoscale Meteorology in Midlatitudes” by Paul Markowski and Yvette Richardson

Reference

“Mesoscale Meteorology and Forecasting” Edited by Peter S. Ray

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Office of Academic 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; email academicaccess@unca.edu; use this link <https://uncaoaintake.youcanbook.me/>; or drop by the Academic Accessibility Office, room 005 in the One Stop suite (lower level of Ramsey Library). Learn more about the process of registering, and the services available through the Office of Academic Accessibility here: <https://oaa.unca.edu/>

While students may disclose disability at any point in the semester, students who receive Letters of Accommodation are strongly encouraged to request, obtain and present these to their professors as early in the semester as possible so that accommodations can be made in a timely manner. It is the student's responsibility to follow this process each semester.

Sexual Harassment and Misconduct

All members of the University community are expected to engage in conduct that contributes to the culture of integrity and honor upon which the University of North Carolina at Asheville is grounded. Acts of sexual misconduct, sexual harassment, dating violence, domestic violence and stalking jeopardize the health and welfare of our campus community and the larger community as a whole and will not be tolerated. The University has established procedures for preventing and investigating allegations of sexual misconduct, sexual harassment, dating violence, domestic violence and stalking that are compliant with Title IX federal regulations. To learn more about these procedures or to report an incident of sexual misconduct, go to titleix.unca.edu. Students may also report incidents to an instructor, faculty or staff member, who are required by law to notify the Title IX Office.

Academic Alerts

Faculty at UNCA are encouraged to use the university's Academic Alert system to communicate with students about their progress in courses. Academic Alerts can reflect that a student's performance is satisfactory at the time the alert is submitted, or they can indicate concerns (e.g., academic difficulty, attendance problems, or other concerns). Professors use the alert system because they are invested in student success and want to encourage open conversations about how students can improve their learning, and students who respond to alerts quickly are consistently more likely to earn credit for the course. Please note, professors of 100-level courses are required to submit at least one alert about each student on or before the seventh week of classes.

When a faculty member submits an alert that expresses a concern, the student receives an email from Academic Advising notifying them of the alert and subsequent registration

hold on their account. To clear the hold, the student must complete a short Google Response Form included in the alert e-mail; the results will be shared with their instructor and advising staff. Instructors may also request to meet with the student to discuss the alert.

Questions about the Academic Alert system can be directed to Anne Marie Roberts (amrober1@unca.edu) in OneStop Advising and Learning Support.

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 Integrity

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, cheating, or use of unauthorized materials or assistance is academic dishonesty. A person who knowingly assists another in academic dishonesty is likewise guilty of dishonesty. A student committing a first offense of dishonesty will receive a failing grade or a grade of zero for the assignment or test. A student committing a second offense of dishonesty will receive a failing grade in the course and be reported to the Senior Director of Student Success.

In all situations where a student has been disciplined for academic dishonesty, the instructor must submit a brief statement of the case to the Senior Director of Student Success with a copy to the student. The Senior Director maintains records of academic dishonesty incidents and notifies the instructor when a student is found to have multiple offenses. Depending upon the severity and/or repetition of the offense, the Senior Director and/or instructor may recommend that the Provost impose an additional penalty, such as cancellation of graduation with honors, cancellation of scholarships, or dismissal from the university. If the Provost decides that additional penalties are warranted, the student will be notified in writing.

If a student feels that he or she has been unjustly accused of academic dishonesty, the student has ten (10) class days from the date of the instructor's written notification to the student to respond in writing. This response is to be sent to both the instructor and the Senior Director of Student Success. The instructor should then meet with the student to discuss the charges within five (5) class days. If needed, the student may then contact the Senior Director for assistance in identifying options for possible resolution. If needed, the Faculty Conciliator will be contacted to mediate and/or convene the Academic Appeals Board.