

**Syllabus for ATMS 410 – Synoptic Meteorology I – Fall 2022**

Date	Topic	Reading/Homework*
T 16 Aug 2022	Introduction	Lecture packet (LP) #1
R 18 Aug	General Circulation	LP#2
T 23 Aug	“	
R 25 Aug	“	Project#1
T 30 Aug	“	Quiz#1
R 1 Sep	Atmospheric oscillations	LP#3, Project#2
T 6 Sep	“	
R 8 Sep	Teleconnections	LP#4, Project#3
T 13 Sep	“	Quiz#2
R 15 Sep	“	Project#4
T 20 Sep	Lecture/ review	
<b>R 22 Sep</b>	<b>Exam I</b>	<b>16 Aug – 20 Sep material</b>
T 27 Sep	Kinematics and dynamics	LP#5
R 29 Sep	“	Project#5
R 6 Oct	“	
T 11 Oct	Mid-latitude cyclone development	LP#6 Quiz#3
R 13 Oct	“	Project#6
T 18 Oct	“	
R 20 Oct	“	Project#7
T 25 Oct	“	Quiz#4
R 27 Oct	“	Project#8
T 1 Nov	Lecture/ review	
<b>R 3 Nov</b>	<b>Exam II</b>	<b>27 Sep – 1 Nov material</b>
T 8 Nov	Mid-latitude cyclone development	Project#9
R 10 Nov	“	
T 15 Nov	Three-dimensional structure of mid-latitude cyclones	LP#7
R 17 Nov	“	
T 22 Nov	<i>Undergraduate Research Day</i>	<i>no classes</i>
T 29 Nov	Group presentations	<b>Final Project Report</b>

\*assignment completed before class meets on this date

**Description**

A course which examines the causes and effects of mid-latitude synoptic-scale (~2000 km horizontal wavelength) cyclones, the predominant feature on TV weather maps, with a two-fold purpose; (1) to unify the many concepts you have learned while in the atmospheric sciences program and (2) to provide the necessary skills for being a knowledgeable weather forecaster. Although today’s computer weather models are beyond the human forecast capabilities, the human is still a necessary component in the weather forecast loop who can know when the computer models are likely to be in error and use their experience and pattern recognition capabilities to improve the overall operational weather forecast product.

## Student Learning Outcomes

- generate an accurate conceptual model of atmospheric structure and evolution valid on the synoptic-scale
- improve problem-solving skills by applying knowledge to actual weather case studies
- develop an ability to make a significant contribution to a team-based research effort

## Outline

Introduction

General circulation {Carlson, Ch. 5}

Atmospheric oscillations {course notes}

Teleconnections {course notes}

Kinematics and dynamics {Carlson, Ch. 1, 2, 3}

Mid-latitude cyclone development {Carlson, Ch. 4, 10}

Three-dimensional structure of mid-latitude cyclones {Carlson, Ch. 12.1-12.4}

## Grading

Projects	15%
Quizzes	5%
Exam I	20%
Exam II	20%
Final Exam	25%
Final Project	15%
<b>Total</b>	<b>100%</b>

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. The first part of each project will involve the analysis of a weather event or scenario using GARP or web tools and will require group coordination and response. The second part of each project will involve a “work ‘em out” task whose answers each student will hand in individually. Each group member is *strongly encouraged* to work individually on the weather event or scenario analysis. Students in the past have failed exams because they let others do the work on group projects.

## Quizzes

Quizzes will be given bi-weekly, at the beginning of the class period on Tuesdays during those weeks when we are in the midst of lecture material (non-exam weeks). Quizzes are given to help the student gauge their understanding of the weekly lecture material and the individual “work ‘em out” questions on the projects. The lowest quiz score will be *dropped* and not count toward the final course grade.

### **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.

### **Final Exam**

The final exam is a *comprehensive* exam in which all the material contained in the entire course is testable.

### **Final Project**

The final project consists of a group project in which each group will serve as a private forecasting company to determine the optimal route for a ship making a hazardous ocean crossing. The project will consist of a written analysis report as well as a presentation defining the optimal route determined by your forecasting company.

### **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 day they are due and will have an automatic 10% deduction from their final score. Assignments handed in after 4:30 pm on the day 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 special circumstances may consist of an individual oral graded question and answer session at a mutually agreed upon time outside of the usual class meeting time.

### **Extra Credit**

Participate in the national weather challenge forecast competition (details will be announced soon) and earn *five* points on the ATMS 410 final exam. “Win” the forecast contest for all students enrolled in Synoptic I and earn *seven* points on the final exam. Sign up to give a “Five for Five” discussion and earn *three* points on the ATMS 410 final exam.

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### **Instructor**

Doug Miller  
232-5158

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

### **Textbook**

“Mid-Latitude Weather Systems” by T. N. Carlson © 1998.  
References are used extensively and are given on the final page of each lecture packet.

(continued)

### **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](mailto:academicaccess@unca.edu); use this link <https://uncaoaaintake.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](http://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](mailto: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](http://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.