

### Syllabus for ATMS 410 – Synoptic Meteorology I – Fall 2013

Date	Topic	Reading/Homework*
T 20 Aug 2013	Introduction	Lecture packet (LP) #1
R 22 Aug	General Circulation	LP#2
T 27 Aug	“	
R 29 Aug	“	Project#1
T 3 Sep	“	Quiz#1
R 5 Sep	Atmospheric oscillations	LP#3, Project#2
T 10 Sep	“	
R 12 Sep	Teleconnections	LP#4, Project#3
T 17 Sep	“	Quiz#2
R 19 Sep	“	Project#4
T 24 Sep	Lecture/ review	
<b>R 26 Sep</b>	<b>Exam I</b>	<b>20 Aug – 24 Sep material</b>
T 1 Oct	Kinematics and dynamics	LP#5
R 3 Oct	“	Project#5
R 10 Oct	“	
T 15 Oct	Mid-latitude cyclone development	LP#6 Quiz#3
R 17 Oct	“	Project#6
T 22 Oct	“	
R 24 Oct	“	Project#7
T 29 Oct	“	Quiz#4
R 31 Oct	“	Project#8
T 5 Nov	Lecture/ review	
<b>R 7 Nov</b>	<b>Exam II</b>	<b>1 Oct – 5 Nov material</b>
T 12 Nov	Mid-latitude cyclone development	Project#9
R 14 Nov	“	
T 19 Nov	Three-dimensional structure of mid-latitude cyclones	LP#7
R 21 Nov	“	
T 26 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 (ask Dr. Hennon for details) 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.

---

**Instructor**

Doug Miller  
232-5158

<http://www.atms.unca.edu/dmiller/courses/index.htm>  
[dmiller@unca.edu](mailto: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.

**Disabilities**

Contact Prof. Miller early in the course if you have a disability that requires special accommodation.

**Academic Integrity**

Cheating or plagiarism results in a failed assignment, quiz, or exam on the first infraction. A second infraction results in course failure and a report to the UNCA administration. See <http://catalog.unca.edu/>, click on “Academic Policies and Procedures” and read “Student Responsibilities” for a refresher on the UNCA policy.