

### Syllabus for ATMS 411 – Synoptic Meteorology II – Spring 2015

Date	Topic	Reading/Homework*
T 13 Jan 2015	Introduction/ Review	Lecture notes
R 15 Jan	Review	
T 20 Jan	3D Structure of Cyclones	Ch. 12.1-12.4
R 22 Jan	“	SW#1 due
T 27 Jan	“	
R 29 Jan	“	SW#2 due
T 3 Feb	“	<a href="#">Quiz#1</a>
R 5 Feb	Jet streams and streaks	SW#3 due
T 10 Feb	“	
R 12 Feb	“	Ch. 14.1, 15.1-15.7, SW#4 due
T 17 Feb	“	
R 19 Feb	“	SW#5 due
T 24 Feb	“	<a href="#">Quiz#2</a>
R 26 Feb	Lecture/review	
T 3 Mar	<b>Exam I</b>	13 Jan – 26 Feb material
R 5 Mar	Fronts and frontogenesis	Ch. 13, 14.3-14.7, SW#6 due
T 17 Mar	“	
R 19 Mar	“	SW#7 due
T 24 Mar	“	<a href="#">Quiz#3</a>
R 26 Mar	“	
T 31 Mar	“	<a href="#">Quiz#3</a>
R 2 Apr	Planetary boundary layer	Lecture notes, SW#8 due
T 7 Apr	“	<a href="#">Quiz#4</a>
R 9 Apr	Lecture/review	
T 14 Apr	<b>Exam II</b>	5 Mar – 9 Apr material
R 16 Apr	Planetary boundary layer	SW#9 due
T 21 Apr	“	
R 23 Apr	“	SW#10 due
Final Exam Period	<b>Exam III</b>	13 Jan – 23 Apr material

\*assignment completed before class meets on this date

#### Description

A continuing 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

### Review

- Mid-latitude cyclone development {Carlson, Ch. 4, 10}
- Three-dimensional structure of mid-latitude cyclones {Carlson, Ch. 12.1-12.4}
- Jet streams and streaks {Carlson, Ch. 14.1, 15.1-15.7}
- Fronts and frontogenesis {Carlson, Ch. 13, 14.3-14.7}
- Planetary boundary layer and its impacts on the synoptic scale {lecture notes}
- Lee cyclogenesis *{time permitting}*

## Grading

Synopsis/WEO!	10%
Quizzes	5%
Exam I	25%
Exam II	25%
Final Exam	30%
Map Discussion	5%
<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

## Synopsis/WEO!

The “Synopsis/WEO!” assignments consist of a Petterssen-Sutcliffe-based synopsis of a given mid-latitude cyclone outside of the North American continent (first part) and the second part (“WEO!”) involves 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 synopsis before assembling the final group synopsis. Students in the past have failed exams because they let others do the work on group projects.

## Map Discussion

The map discussion given as part of your senior comprehensive exams will also count as part of your grade for Synoptic II. You will have one opportunity to practice in front of your peers before giving the “final” map discussion in front of the ATMS faculty. You can choose to practice as many times as you would like in front of classmates, mirrors, and/or favorite stuffed animals.

## Quizzes

Quizzes will be given bi-weekly, at the beginning of the class period on Thursdays 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. Participate in the national weather forecast competition and earn *five* points on the ATMS 411 final exam. “Win” the forecast contest for all students enrolled in Synoptic II and earn *seven* points on the final exam.

## **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 will 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 411 final exam. “Win” the forecast contest for all students enrolled in Synoptic II and earn *seven* points on the final exam.

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## **Instructor**

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## **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://www.unca.edu/catalog/academicregs.html> under “Student Responsibilities” for a refresher on the UNCA policy.