

Syllabus for ATMS 410 – Synoptic Meteorology I – Fall 2015

| Date | Topic | Reading/Homework* |
|-----------------|--|---------------------------------|
| T 18 Aug 2015 | Introduction | Lecture packet (LP) #1 |
| R 20 Aug | General Circulation | LP#2 |
| T 25 Aug | “ | |
| R 27 Aug | “ | Project#1 |
| T 1 Sep | “ | Quiz#1 |
| R 3 Sep | Atmospheric oscillations | LP#3, Project#2 |
| T 8 Sep | “ | |
| R 10 Sep | Teleconnections | LP#4, Project#3 |
| T 15 Sep | “ | Quiz#2 |
| R 17 Sep | “ | Project#4 |
| T 22 Sep | Lecture/ review | |
| R 24 Sep | Exam I | 18 Aug – 22 Sep material |
| T 29 Sep | Kinematics and dynamics | LP#5 |
| R 1 Oct | “ | Project#5 |
| R 8 Oct | “ | |
| T 13 Oct | Mid-latitude cyclone development | LP#6 Quiz#3 |
| R 15 Oct | “ | Project#6 |
| T 20 Oct | “ | |
| R 22 Oct | “ | Project#7 |
| T 27 Oct | “ | Quiz#4 |
| R 29 Oct | “ | Project#8 |
| T 3 Nov | Lecture/ review | |
| R 5 Nov | Exam II | 29 Sep – 3 Nov material |
| T 10 Nov | Mid-latitude cyclone development | Project#9 |
| R 12 Nov | “ | |
| T 17 Nov | Three-dimensional structure of mid-latitude cyclones | LP#7 |
| R 19 Nov | “ | |
| T 24 Nov | Group presentations | Final Project Report |

*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% |
| 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. 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.

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

University of North Carolina at Asheville is committed to making courses, programs and activities accessible to persons with documented disabilities. Students requiring reasonable accommodations must register with the Office of Academic Accessibility by providing supporting documentation. All information provided will remain confidential. For more information please contact the Office of Academic Accessibility at (828)232-5050 or academicaccess@unca.edu, visit them in the OneStop Student Services Center or at their website <https://oaa.unca.edu/>.

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.