Syllabus for ATMS 316 – Mesoscale Meteorology – Spring 2016

Date	Topic	Reading/Homework*
T 12 Jan 2016	Introduction/ Overview	
R 14 Jan	What is the Mesoscale?	Chapter 1
T 19 Jan	Lake-effect convection	Chapter 4
R 21 Jan	"	Quiz#1
T 26 Jan	Northwest flow snowfall	Miller (2012) , Project#1 due
R 28 Jan	"	Quiz#2
T 2 Feb	Polar lows	Nordeng & Rassmussen (1992)
R 4 Feb	"	Quiz#3
T 9 Feb	Synoptic fronts	Chapter 5, Project#2 due
R 11 Feb	"	Quiz#4
T 16 Feb	Mesoscale Gravity Waves	Chapter 6
R 18 Feb	"	Quiz#5, Project#3 due
T 23 Feb	Presentations, Round#1	Presentation#1 due
R 25 Feb	"	
T 1 Mar	Lecture/Review	
R 3 Mar	Exam I	12 Jan – 1 Mar material
T 15 Mar	Mountain Waves and Downslope Windstorms	Chapter 12
R 17 Mar	"	Quiz#6
T 22 Mar	Drylines and outflow boundaries	Chapter 5
R 24 Mar	"	Quiz#7
T 29 Mar	Convection Initiation	Chapter 7
R 31 Mar	"	Quiz#8, Project#4 due
T 5 Apr	Organization of Isolated Convection	Chapter 8
R 7 Apr	**NCUR**	Quiz#9
T 12 Apr	Mesoscale Convective Systems	Chapter 9
R 14 Apr	Hazards Associated with Deep Moist Convection	Chapter 10, Project#5 due
T 19 Apr	"	Quiz#10
R 21 Apr	Presentations, Round#2	Presentation#2 due
Final Exam Period	Exam II	15 Mar – 21 Apr 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 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

Description (continued)

(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 Rassmussen (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%**

$92\% < \text{total score} \leq 100\%$	A
$90\% < \text{total score} \leq 92\%$	A-
$88\% < \text{total score} \leq 90\%$	B+
$82\% < \text{total score} \leq 88\%$	B
$80\% < \text{total score} \leq 82\%$	B-
$78\% < \text{total score} \leq 80\%$	C+
$72\% < \text{total score} \leq 78\%$	C
$70\% < \text{total score} \leq 72\%$	C-
$68\% < \text{total score} \leq 70\%$	D+
$60\% < \text{total score} \leq 68\%$	D
$\text{total score} \leq 60\%$	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 disussion (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 given 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 (2006 – 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 6:30 pm on the date they are due and will be have an automatic 10% deduction from their final score. Assignments handed in after 6:30 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.

NCUR extra credit

Earn 5 points on mid-term II by attending an ATMS-related session at NCUR (7-9 April 2016; must sign in with a UNCA professor to earn the points).

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

Disabilities

Contact Prof. Miller early in the course if you have a disability that requires a 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/content.php?catoid=9&navoid=509 under "Student Responsibilities" for a refresher on the UNCA policy.