ATSC 5008 Mesoscale Meteorology
Fall 2011

Instructor: Dr. B. Geerts, geerts@uwyo.edu, 6062 Eng Bldg, 766-2261.

Class schedule: Tue 10:00-11:50 am in ENG 6060

Textbook: Markowski and Richardson 2010: *Mesoscale Meteorology in Midlatitudes*. Wiley-Blackwell, 407 pp. We will follow this book rather closely.

Additional books and resources:

Ray, P.S., 1986: Mesoscale Meteorology and Forecasting. AMS, 793 pp. This book contains many separate, disconnect overview articles, by experts in the field. A good reference, but a bit dated.

Houze, R., 1993: Cloud Dynamics. Academic Press, 573 pp. This book is the best reference for the mesoscale organization of precipitation systems. It also has good chapters on cloud physics, radar meteorology, and cloud types.

Lin, Y-L, 2008: Mesoscale Dynamics. Cambridge University Press, 623 pp. This is probably the best book for atmospheric wave phenomena, incl. orographic waves. It is rather theoretical, but also has sections summarizing published literature.

Select COMET modules (http://www.meted.ucar.edu/topics_meso.php)

Website: http://weather.uwyo.edu/~geerts/atsc5008/ (will include lecture slides, links, assignments …)

Topics:

Not all book Chapters can be covered in a 2cr class. We selected the ones highlighted in green.

Chapter 1. What is the mesoscale?	Yes
Chapter 2. Governing equations, and analysis tools	Yes
Chapter 3. Mesoscale instabilities	Yes
Chapter 4. The boundary layer	No
Chapter 5. Mesoscale air mass boundaries	No
Chapter 6. Mesoscale gravity waves	No
Chapter 7. Convective initiation	Yes
Chapter 8. Organization of isolated convection	Yes
Chapter 9. Mesoscale convective systems	No
Chapter 10: Severe thunderstorm impacts (tornadoes)	No
Chapter 11: Thermally forced circulations near mountains	Yes
Chapter 12: Mountain waves & downslope windstorms	Yes
Chapter 13: Blocked flow	Yes

Assessment:

Homeworks: 6 homeworks, 5 % each	30%
Midterm: Tuesday 11 October	20%
Final exam:	25%
Term project:	20%
Class participation, effort, evidence of progress	5%

Term project

- a case study of a mesoscale phenomenon
- preferably team work, 2-3 people per team
- observational and/or modeling work
- regular updates throughout the semester, oral presentation in last week(s)
- write-up report, in format similar to an AMS paper submitted (see http://www.ametsoc.org/pubs/authorsguide/pdf_vs/authguide.pdf), double-spaced, references, Figs at the back, but a different word limit: max 3000 words of text, Abstract to Conclusions. A good reference to good writing in our field is the book "Eloquent Science" by Dave Schultz (http://eloquentscience.com/)
- examples from previous years: the Laramie tornado of 5/22/08 (published in Elect J. Severe Storms Meteor.), a Laramie dryline case study (Patrick Campbell seminar, Dec 2009)

A note on academic integrity and plagiarism

Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at the University of Wyoming, and all students are expected to act in accordance with this principle. Consistent with this expectation, all students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts.

Academic integrity includes a commitment *not to engage in or tolerate acts of plagiarism, falsification, misrepresentation, or deception*. Such acts of dishonesty violate the fundamental ethical principles of the academic community and compromise the worth of work completed by others.

Evidence of plagiarism may result in expulsion from the course (with an F grade) as well as dismissal or suspension from the University of Wyoming (Unireg #030-1970).