**ATSC 5008    Mesoscale Meteorology    Fall 2015**

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

**Class schedule:** Tuesdays 10:00-1150 am in ENG 6060

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

**Additional books and resources:**
Lin, Y-L, 2008: Mesoscale Dynamics. Cambridge University Press, 623 pp. This is probably the best book for the linear theory of 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://www.atmos.uwyo.edu/~geerts/atsc5008/ (will include lecture slides, links, assignments ...)

**Topics:**
Not all book Chapters can be covered in a 2cr class. The textbook Chapters I propose we select this year are highlighted in green.

- **Chapter 1. What is the mesoscale?** Yes
- **Chapter 2. Governing equations, and analysis tools** Yes
- **Chapter 3. Mesoscale instabilities** Yes (3.5 only)
- **Chapter 4. The boundary layer** No
- **Chapter 5. Mesoscale air mass boundaries** No
- **Chapter 6. Mesoscale gravity waves** Yes
- **Chapter 7. Convective initiation** No
- **Chapter 8. Organization of isolated convection** No
- **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 12 in Houze (2014): Orographic clouds and precip** Yes
- **Chapter 13: Blocked flow** Yes

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

Term project
- a case study of a mesoscale phenomenon of your choice
- preferably team work, 2-3 people per team
- observational and/or modeling work
- regular updates throughout the semester, oral presentation in last week(s)
  - 9/22: 1-page team summary of proposed project (case specs, objectives, tools)
  - 10/13: 10 min team presentations to discuss issues, raise questions
  - 12/1 or 12/8: presentations (30 min + 10 min Q&A)
  - 12/15: report due
- 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/)

Grading

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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).