MEA 715: Dynamics of Mesoscale Precipitation Systems  
Fall Semester 2011

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Class meetings: Tues., Thurs., 3:00–4:15 PM, Jordan Hall 1109

Office hours: by appointment

Pre–requisites: Undergraduate dynamics (e.g. MEA 421–422) and cloud physics (e.g. MEA 412)

Recommended text: Cloud Dynamics, by Robert Houze, Jr.  
(out of print: contact instructors for link to the PDF file)

Class website: accessed via https://wolfware.ncsu.edu  
links to handouts, images from class, help on assignments, etc.

Course theme: The aim of this course is to use the topic area of mesoscale convective systems (MCSs) in order to learn about dynamics, microphysics, observations and modeling. MCSs are an optimal subject area for cross-cutting instruction. MCSs contain jointly interacting processes at the synoptic, meso-, and convective scales, and they include both convective and stratiform precipitation.

Student learning outcomes: By the completion of this course, you should be able to:

1) explain the fundamental processes governing precipitation systems across a range of environments (tropical and midlatitude, daytime and nocturnal, strongly-forced and weakly-forced);
2) explain the origins and subsequent influences of fundamental mesoscale circulations that emerge in/near mesoscale precipitation systems;
3) explain the dynamical, microphysical, and environmental underpinnings of societal hazards (such as severe surface winds and extreme precipitation) that occur in association with mesoscale precipitation systems;
4) explain and critique the basic techniques used in studies of mesoscale precipitation systems, including the capabilities and limitations of instruments and models;
5) write concise and complete summaries of journal articles; and,
6) evaluate the quality and rigor of journal articles and conference presentations in this content area.

Course philosophy: This is an elective, advanced, graduate–level course. It is expected that all students will stay current with reading and assignments throughout the semester to maximize their benefit from the course. If you have doubts about your ability to complete the course, please consult with us.
**Special accommodations:** You have the right to appropriate, confidential accommodations of a disability. “Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 515-7653. For more information on NC State’s policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation (REG02.20.1)”

**Assessments:** Your grade will be determined by your performance on the following: roughly 2–4 homework assignments; roughly 15 journal article outlines; a semester project; and, three formal examinations (two midterms and a final). Most of these assessments will be “open book”, with an emphasis on understanding, not memorization.

**Grading criteria:** 50% from your exam scores, weighted equally; 20% from your outline scores, weighted equally; 20% from your semester project score; and, 10% from your homework scores, weighted equally. Your final letter grade will follow the familiar scale: ≥ 93% A, 90–92.9 A-, 87–89.9% B+, 83–86.9% B, 80–82.9% B-, etc. We reserve the right to adjust this at the end if the grade distribution looks “too low”. University regulations concerning withdrawals and incompletes will be strictly enforced.

**Academic integrity:** It is expected that students are versed in the Code of Student Conduct Policy, and will abide by it. Repeated here are the provisions relating to academic dishonesty.

1. Academic dishonesty is the giving, taking, or presenting of information or material by a student that unethically or fraudulently aids oneself or another on any work which is to be considered in the determination of a grade or the completion of academic requirements or the enhancement of that student’s record or academic career.

2. A student is guilty of a violation of academic integrity if he or she:
   - represents the work of others as his or her own;
   - obtains assistance in any academic work from another individual in a situation in which the student is expected to perform independently;
   - gives assistance to another individual in a situation in which that individual is expected to perform independently;
   - offers false data in support of laboratory or field work.

*You have committed academic dishonesty if you give, receive, or tolerate others’ use of unauthorized aid.*

Violations of academic integrity will result in automatic failure of the class and referral to the proper university officials. The work that you submit must be your own and you must have completed it specifically for the particular assignment in this class. Make no assumptions: please contact us if you are unsure about whether we have authorized a source of aid.