

**METR 5243 Syllabus**



**Class Day & Time:** TTr, 1130 AM -1245 PM

**Location:** NWC 5820

**Instructors:** William H. Beasley and Donald R. MacGorman

**Offices:** DRM NWC 4352  
WHB NWC 5650

**Office Hours:** by appointment

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**Text:** The Electrical Nature of Storms, MacGorman and Rust, Oxford, 1998, ISBN 0-19-507337-1

## **COURSE DESCRIPTION**

This course will provide a broad overview of the electrical nature of storms. We will follow the text fairly closely, beginning with a review of basic principles of electromagnetic fields and waves and the behavior of electric charges and currents. To place the topics of thunderstorm electrification in context, we will also discuss the interaction of the earth with the solar wind and interplanetary medium, the global circuit, and fair-weather electricity. We will review the principles of operation of some of the instruments used to make observations of the electrical nature of storms. Finally, we will discuss the electrical properties of storms in the context of the meteorology of storms.

## **EXPECTATIONS**

**Background:** We assume that students entering this course are conversant with the topics that are common to undergraduate programs in meteorology, physics, and engineering. Therefore we will use tools as needed from calculus, differential equations, vector analysis, introductory classical physics (e.g., mechanics), electricity and magnetism and modern physics. We assume that students entering this course most likely will not have had extensive exposure to

the subjects of electricity and magnetism beyond that which is generally seen in undergraduate physics courses, in other words, at best a once-over-lightly treatment of the Maxwell equations. Thus we will start with the Tutorial chapter of the text in order to provide a systematic review of the basic concepts that underlie the rest of the course.

**Effort:** This is a graduate course. That means that students are assumed to be highly motivated and participatory. We expect that students will keep up with reading assignments and problem sets. We expect students to ask and to answer questions in class. We estimate that on average, students should expect to invest at least 3 hours outside of class for every 1 hour in class.

### **Course Grade**

Course grade will be determined as follows:

Exams (3)	90%
Homework	10%

To help you prepare for the exams, we will assign problem sets. We will collect the problem sets and check them over to see how you are doing, then return them with a solution sheet or guidelines as appropriate. Solutions may be posted on D2L. The problem sets will be graded on an S/U basis, S reflecting what we judge to be an honest effort. Ultimately it will be up to you to determine whether you understand the problems in sufficient depth to withstand examination over similar problems. We will help when asked, but we do not plan to go over every problem in the problem sets in detail except to address specific questions from you. We encourage students to work together on problem sets and we also expect each student to turn in her or his own work.

### **Academic Misconduct**

Academic misconduct is defined as "any act that improperly affects the evaluation of a student's academic performance or achievement." All faculty at the University of Oklahoma expect academic integrity from each student. Misconduct such as plagiarism, submission of work for more than one class, fabrication, and fraud, as well as attempting to commit such act or assisting others in so doing, will not be tolerated. Students are responsible for knowing the OU Academic Code, which can be found at <http://www.ou.edu/studentcode> and [www.ou.edu/provost/integrity](http://www.ou.edu/provost/integrity).

### **Integrity Pledge (required on exams)**

On my honor, I affirm that I have neither given nor received any aid in the completion of this examination.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

For background on the Integrity Pledge and the Honor Council, please go to <http://www.ou.edu/honorcouncil/>

### **Reasonable Accommodation Policy**

The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with the professor as early in the semester as possible. Students with disabilities must be registered with the Office of Disability Services prior to receiving accommodations in this course. The Office of Disability Services is located in Goddard Health Center, Suite 166, phone 405/325-3852 or TDD only 405/325-4173.