

**Master Syllabus**  
***Department of Geography***

**GEOG 490/590: Field Observation of Severe Local Storms**

**Course Description**

Three-week field trip in the Great Plains region to forecast, observe, and document severe thunderstorms and tornadoes. (6 credit hours).

Prerequisite: Instructor Permission

**Course Objectives**

The objective of the course is to provide an opportunity for students to observe supercells and other convective-related weather phenomena in the field. Specific aims of the course are to enable students to:

1. accurately forecast the development, evolution, and decay of single cell, multicell, and supercellular thunderstorms through use of weather data and tools such as Doppler radar,
2. safely and ethically track and observe such storms while in the field,
3. visit physically and/or culturally significant places in or near the Great Plains.

**Course Rationale**

Students will develop a conceptual framework to identify (visually and through radar) convective phenomena in the atmosphere. Students will learn how to combine their observations with tools such as maps, soundings, and Doppler radar to forecast the development, evolution, and decay of convective phenomena. This learning will be greatly enhanced by in situ observations conducted while in the field. Most forecasters experience severe weather only a few times a year, while students on this trip will get experience with extreme convective events almost every day, an invaluable experience. Geography 490 fulfills the regional credit requirement for the Option IV: Meteorology and Climatology, Professional Track; Geography 590 partially fulfills the elective requirement. In addition, this course may be used by those seeking qualification for the title "meteorologist" by the American Meteorological Society (AMS) and for employment by the National Weather Service under the Federal Civil Service guidelines (GS-1340).

**Course Content and Format**

Initial learning will occur in a lecture-style format that will include multimedia presentations and case study discussions. These lectures occur over a multiweek

period of the spring semester or during an intensive one to two week period at the beginning of the summer session. The following shows an example of a potential outline of topics for this course, with time allotment for each topic at the discretion of the instructor based, in part, on the meteorological background of students in the class:

- Basic skills, including Z-time, Obs and Station Models, Isoplething
- Meteorological Analysis: Surface Maps and Fronts; Upper Air Charts
- Thunderstorm Types and Threats (incl. Tornadoes)
- Weather tools and forecasting, including Skew-Ts Diagrams, Hodographs, and Doppler Radar
- An Introduction to the Geography of the Great Plains

The field portion of the course will occur during May and the first half of June, which is the time of year when tornadic supercells are most likely to occur on the Great Plains. The field study portion of the course will mostly occur within the area bounded between Canada and Mexico and roughly between interstate highways 25 and 35, though weather conditions or other events may necessitate occasional forays outside of this region.

### **Textbook Suggestions**

Vasquez, Tim, 2008: *Storm Chasing Handbook*. 322 pp.

### **Methods for Evaluating Student Performance:**

Forms of evaluation prior to departure might include an examination, quizzes, and homework problem sets. While on the trip, students are evaluated on leadership, initiative, and individually written blogs. Graduate students enrolled in the course as Geography 590 would be expected to accomplish an additional work load (e.g., guest lecture, additional leadership on the trip, a term paper case-study of an event on the trip, etc.).

### **Evaluation of the Course**

Student evaluation of the course using university (and departmental) course evaluation forms.