Course Syllabus

Atmospheric Sciences 5940: Synoptic Meteorology Laboratory
Class Meetings: MW 1:50-2:45 p.m.
Classroom: Derby Hall 1080.

Instructor: Jay Hobgood
Office: Room 1100 Derby Hall
Office phone: 292-3999
Office hours: MW 3:00-5:00 p.m. or by appointment
Email: hobgood.1@osu.edu

Course Prerequisites: Concurrent Geography 520 or 5900, or Atmospheric Sciences 230 or 2940.

Note 1: This course is a prerequisite for Geography 5941.

Note 2: This course is not open to students with credit for Atmospheric Sciences 620, or Geography 620 or 5940.

Course Objectives: the objectives of this course are to introduce students to the basic meteorological variables, the methods by which they are measured, and the techniques by which observations are gathered, analyzed and displayed for use in applications to weather forecasting. The specific aims of this course are to introduce: (1) the Automated Surface Observing System (ASOS), (2) the METAR code used to transmit the surface airways observations, (3) the rawinsonde, (4) the code used to transmit upper air observations, (5) methods of plotting surface and upper air observations, (6) the types of meteorological satellites, sensors, and imagery, (7) the characteristics and products of the WSR-88D weather radar, (8) standard techniques for the plotting and analysis of surface and upper air data, (9) the SKEWT thermodynamic diagram, (10) characteristics of meteorological models, (11) output from numerical models and (12) supplemental forecast products.

Course Structure: The class will meet for two days per week for 55 minutes each meeting. Material will be presented during the class that fulfills the basic course aims and objectives (see above). The course is divided into 12 topics that focus on data, analyses and graphics that convey vital information on the state of the atmosphere and which are needed to forecast accurately the future state of the atmosphere. A brief outline of the topics is given later in this syllabus. A heavy emphasis is placed on analysis of synoptic charts and diagrams and on a "hands on" learning of the analytical techniques. Much of the work in this course is therefore devoted to *individual* laboratory work and analysis of weather maps and charts.

Note: The National Weather Service undergoes a continual process of modernization and upgrades. The changes that occur as a result of the modernization and upgrades make obsolete many of the printed materials with technical information about the acquisition and dissemination of synoptic weather data. Any textbook on this material would be out of date before it appeared in print. Because of the ongoing and continual process of modernization supplemental material will be posted on the course web page and links to appropriate sources of online documentation will be provided.

Course requirements: Your grade in this course will be determined by two examinations and sets of homework problems.

1. The **first examination** will occur on **March 4, 2015** and it will comprise 35% of your final grade.

2. The *comprehensive* **final examination** will occur from **4:00-5:45 p.m.** on **Tuesday May 5, 2015** and it will comprise 40% of your final grade.

3. The **homework assignments** will be distributed in class and will comprise 25% of your final grade.

Examination format: The questions on the examinations will represent a mixture of formats. Some questions will be short answer (e.g. multiple choice, true/false, fill in the blank). Some questions may require short essays to answer them completely. Some questions will require the proper decoding of surface and upper air codes. Some questions will require the proper analysis of synoptic maps and charts. The examinations are designed to test your comprehension and understanding of the material, as well as your ability to recall specific information.

Homework assignments: The homework assignments are designed to accomplish several goals. The primary goal of the assignments is to give students practice with basic types of synoptic analyses. A second goal is to get students to think about the analyses in relationship to the atmospheric features and processes they have learned about in other courses. A third goal is to get student more familiar with information and sources of data online and to provide them with the opportunity to learn more about specific topics. Homework assignments are expected to be the work of the student whose name appears on them. Copying another student's work is *plagiarism* and is considered to be *academic misconduct*.

Units: Numerical answers are incomplete unless they are accompanied by the correct units. Students will lose points on examinations and homework assignments if the units are incorrect or are missing.

Academic Misconduct: It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of students academic misconduct wherever committed; illustrated by, but not

limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct (http://studentaffairs.osu.edu/info_for_students/csc.asp).

Disability Services: Students with disabilities that have been certified by the office for Disability Services will be appropriately accommodated, and should identify the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; **http://www.ods.ohio-state.edu/**.

Outline of Topics

1. The Automated Surface Observing System (ASOS), instruments and characteristics.

2. The METAR code, decoding surface airways observations, plotting the surface station model.

3. The rawinsonde, instruments and characteristics.

4. Decoding the upper air observations.

5. Basic plotting of surface and upper air observations.

6. Satellite types, sensors and imagery.

7. The WSR-88D weather radar, characteristics and products.

8. Analysis of surface maps, locating fronts, analysis of upper levels maps, locating warm and cold advection, advection of moist and dry air, vorticity, jet streams.

9. The SKEWT thermodynamic diagram, plotting vertical soundings, using the SKEWT diagram to determine certain stability parameters.

10. Characteristics of numerical models, types of models, horizontal and vertical resolution.

11. Output from numerical models.

12. Supplemental forecast products.