460:230 Weather and Climate Syllabus

Instructor: Dr. Yuan Gao
Office: 140 Smith Hall
Lecture Time: 11:30 am – 12:50pm, Tue & Thurs
Office Hours: 1:00 – 2:00 pm, Tue & Thurs

Course Description:

This course is designed to provide students with a fundamental understanding of basic meteorology, essential background for further studying changes in weather and climate. The topics to be discussed in this course include atmospheric structure, energy transfer, water balance, wind systems, air pollution and climate. Lectures will be supplemented by discussions on live weather conditions and forecasting and severe weather events.

Course Objectives:

This course aims at providing students with a fundamental understanding of basic meteorology, essential background for further studying changes in weather and climate. Three specific objectives of this course are: (1) To understand fundamental concepts of weather and climate, (2) to be able to interpret at general features of the surface weather maps, and (3) to improve the understanding of the interactions of the natural atmosphere and human activities.

Textbook:

The required textbook for this course is: Meteorology Today | An Introduction to Weather, Climate, and the Environment by C. Donald Ahrens, 9th edition, BROOKS/COLE CENGAGE Learning, 2009.

The topics covered:

1. Introduction to the Earth and its Atmosphere
2. Energy and Atmospheric Optics
3. Temperature (daily, seasonal, and as a climate indicator)
4. Atmospheric Humidity
5. Condensation, Clouds, and Precipitation
6. Air Pressure and Winds (small and global scales)
7. Air masses and Fronts
8. Middle-latitude Cycles
9. Thunderstorms, Tornadoes, Hurricanes
10. Weather Forecasting
11. Air Pollution
12. Global Climate and Climate Change

Plus, real-time weather discussions at beginning of each lecture.

Grading:

1st Mid-term exam (closed-book): 20%
2nd Midterm exam (close-book): 30%
Final exam (close-book): 50%