Syllabus for G&G 322a/522a, Fall 2004

Chapters for reading refer to Wallace and Hobbs.

1. Introduction  Ch. 1, 7.2.2-7.2.4; Ch. 1 of Ahrens (9/02, 9/07)
   Introduction to course; hydrostatic balance; Basic structure of Earth's atmosphere; composition, temperature, winds.

2. Radiation  Ch. 6 (9/09, 9/14, 9/16)
   Radiative transfer: gaseous absorption, blackbody radiation, introduction to scattering. Radar and satellite remote sensing and image interpretation.

3. Thermodynamics  Ch. 2 (9/21, 9/23, 9/28)
   Thermodynamics of gases and mixtures; latent heat; energy; water vapor. Instruments.

4. Cloud macrophysics  Ch. 5 (5.1, 5.4 only for 322a.) (9/30, 10/5)
   Cloud and storm formation; cloud types; convective instability; hurricanes.
   MIDTERM exam I: Thursday, October 7

5. Cloud microphysics  Ch. 4 (4.1-4.4; the rest optional) (10/12, 10/14)
   Aerosols; cloud droplet nucleation; precipitation formation; lightning; cloud seeding.

6. Extratropical weather  Ch. 3, and peruse Ch. 5.5 (10/19, 10/21)
   Extratropical fronts and cyclones, their associated weather and flow patterns.

7. Climate  Ch. 7 (7.1,7.3, 7.5) (10/26, 10/28, 11/02)
   Global energy balance; climatology and statistics; climate modeling; dynamical systems and chaos; Earth's climate history.
   MIDTERM exam II: Thursday, November 4

8. Fluid mechanics  Ch. 8 (11/9, 11/11, 11/16,11/18)
   The equations of momentum, mass, and energy conservation in a fluid, and applications to weather.

   FALL RECESS (11/18-11/28)

9. General circulation/review  Ch. 9 (9.1-9.4, 9.6, 9.8; the rest optional) (11/18, 11/30, 12/02)
   The general circulation. Review of course.

   FINAL Exam: Tuesday, December 18