

Department of Atmospheric Sciences

COURSE ANNOUNCEMENT – SEMESTER II – 2005-06

ATMS 521: Advanced Atmospheric Dynamics

Call number: 43763

Instructor: Professor W. Robinson, 2110 Atmos. Sci. Bldg., 333-2292

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Room and Time: 109 Atmospheric Science Bldg., 9:00 a.m. MWF

Credit: 4 hours

Prerequisites: ATMS 402 or consent of instructor

This course is intended as a continuation of ATMS 402, with a focus on atmospheric waves, wave-mean flow interactions, and stability.

Course Content:

Course topics will be selected from the following, based upon the interests of the students.

- 1) Baroclinic instability: critical level instability; realistic basic states; life cycles.
- 2) Gravity waves, inertial gravity waves, and tides; gravity wave breaking and gravity-wave drag parameterization.
- 3) Planetary waves: Their vertical propagation and its relevance to the stratosphere; their horizontal propagation and its relevance to teleconnection patterns.
- 4) Wave-mean flow interaction theory: The transformed Eulerian mean circulation and its relevance to tracer transport; stratospheric sudden warmings; "downward control".
- 5) Equatorial waves and their role in large-scale tropical dynamics; the equatorial quasi-biennial oscillation.

The course will emphasize problem solving. Readings will be from a number of standard texts and the research literature.

Recommended text: James R. Holton, "An Introduction to Dynamic Meteorology", Fourth Edition. Elsevier, 2004, 535 pp.

