

**SIO 217B (Winter 2008)**

Atmospheric and Climate Sciences II

*Instructor:* Joel Norris      440 NH      822-4420      [jnorris@ucsd.edu](mailto:jnorris@ucsd.edu)

*Instructor Absence:* I will be gone February 6-16 and March 1-8

*Textbook:* Holton's "An Introduction to Dynamic Meteorology", 4th Edition.

*Website:* You should frequently check the website for updates:  
<http://meteora.ucsd.edu/~jnorris/sio217B/sio217B.html>.

*Grading:* 30% final, 20% two midterms, 50% homework exercises

*Reading:* Students are expected to read the assigned material *before* class time.

*Homework Exercises:* Students will use a software package of their choice to carry out calculations and plot meteorological data. Homework exercises must be completed on time and extensions will be granted only in exceptional circumstances.

*Collaboration:* Students are encouraged to collaborate on homework exercises as long as each student does his or her own work. No collaboration is allowed on exams.

*Examinations:* There will be two midterms and a final.

Topics:

*Basic Principles:* fundamental forces, non-inertial reference frames, basic equations, scale analysis (Holton 1, 2)

*Elementary Applications:* momentum equations, balanced flow, thermal wind (Holton 3)

*Vorticity:* circulation theorem, potential vorticity, vorticity equations (Holton 4)

*Quasi-Geostrophy:* quasi-geostrophic approximation, diagnosis of vertical motion, model of a baroclinic disturbance (Holton 6)

*Baroclinic Instability:* linear perturbation theory, Rossby waves, two-layer model, energetics, (Holton 7.1-2, 7.7, 8.1-3)

*General Circulation:* general circulation and atmospheric energetics, relationship between circulation and distribution of clouds, precipitation, and other climate phenomena (Holton 10.1-7 and supplementary material)

*Tropical Dynamics:* tropical mean circulation, monsoons, ENSO, MJO, condensational heating and vertical motion, equatorial waves (Holton 11 and supplementary material)

*Prediction:* weather and climate predictability, numerical models (Holton 10.8, 13 and supplementary material)