

Syllabus: METR 5123 Spring 2010  
Prof Lance M. Leslie

Time: Tues and Thursday: 1pm – 2-15pm  
Room 5930

This course follows and complements Advanced Atmospheric Dynamics, by Prof Alan Shapiro.

The major sections, each of approximately 2 weeks' duration, are:

1. Fundamentals: Kinematics, Dynamics, Vorticity and related theorems and meteorological examples
2. Shallow Water Equations: Derivation, Types of flows (gravity waves up to planetary waves), phase and group velocity, meteorological and oceanographic examples
3. Instability Theory I: Barotropic and baroclinic instability, examples in the atmosphere and oceans, the Eady Model
4. Instability II: convective instability, inertial instability, double-diffusive instability, Kelvin-Helmholtz instability, instability of a stratified fluid.
5. Ageostrophic flow: Frontogenesis, equatorial waves, hurricanes and other vortices
6. Large scale atmospheric and oceanic flow