

## ESS 130 - Study guide for mid term (Thursday Feb 5th, 3:30-4:50pm)

What you need to know:

- 1 Geometry and bottom topography of the oceans
- 2 Sound propagation, sound channel
- 3 Wave refraction (Snell's law)
- 4 Light transmission, absorption and scattering
- 5 Horizontal distribution of sea surface temperature and salinity
- 6 Vertical profiles of temperature and salinity. Mixed layer. Thermocline.
- 7 Potential temperature.
- 8 Density: dependence on temperature, salinity, pressure.
- 9 Stratification. Static stability.
- 10 Surface gravity waves. Propagation of shallow and deep water waves. Wave energy. Internal waves and Brunt Vaisala frequency.
- 11 Equations of motion:
  - concept of total derivative,
  - Coriolis force, Coriolis parameter
  - gravitational force,
  - friction force, molecular and eddy viscosity, wind stress.
- 12 Conservation of mass: continuity equation.
  - Divergence/convergence.
  - Upwelling/downwelling.
- 13 Ekman currents.
- 14 Inertia currents.

Also, make sure that you know how to do the homework!!!

Midterm is closed book, closed notes. However, I won't ask you to remember how to write complicated equations such as the equations of motion. I might provide them and ask you to manipulate them and to know their physical meaning.

You can use a calculator. Bring it if you want it. Good luck!