

Introduction to Dynamical Oceanography

Office: OCE202

Office Hour: Mon. 2:00-4:00 pm

Purpose of the course:

The course will introduce you to the physical processes influencing the world's oceans. We will study the physical properties of seawater; the dynamics of currents, waves, and tides; numerical models of circulation; and the circulation of the oceans.

Grading:

20% Homework & Participation; 40% Mid-term exam; and 40% Final exam.

Textbooks:

1. Introductory dynamical oceanography, S. Pond and G.L. Picard, 2nd edition, 1991, Pergamon Press.
2. Descriptive physical oceanography: An introduction, G.L. Picard and W.J. Emery, 5th edition, 1990, Pergamon Press.
3. Introduction to Physical Oceanography, R.H. Stewart, 2004, Department of Oceanography, Texas A&M University.
http://oceanworld.tamu.edu/home/course_book.htm

Outline of the course:

Chapter 1. Introduction

Chapter 2. Properties of sea water relevant to physical oceanography

Chapter 3. The basic physical laws used in oceanography and classifications of forces and motions in the sea

Chapter 4. The equation of continuity of volume

Chapter 5. Stability and double diffusion

Chapter 6. The equation of motion in equation

Chapter 7. The role of the non-linear terms and the magnitudes of terms in the equations of motion

Chapter 8. Currents without friction; geostrophic flow

Chapter 9. Currents with friction; wind-driven circulation

Chapter 10. Thermohaline effects

Chapter 11. Numerical models

Chapter 12. Waves