

Introduction to Environmental Oceanography 206-12031 – 3 credits

Dr. Orit Sivan

Syllabus

**Aim**

To understand the basic physical, chemical and biological processes in the oceans

**Topics:**

- 1. Introduction (SW ch 7)**
  - The history of the ocean
  - The ocean system in glacial and interglacial times
  - The ocean and global warming
- 2. Water – an primarily important and exceptional component of Earth (SW ch 1,5)**
  - Properties of water
  - The hydrological cycle
  - Light and sound
- 3. The atmosphere as a heat engine (SW ch 2, O.Cir ch 2-4)**
  - Temperature, heat budget of the ocean
  - ITCZ, Hadley cells, Coriolis force, global wind systems
  - Influence of wind systems on surface water circulation in the oceans
  - Eckman transport and geostrophic flow
  - Main surface water circulation
  - The physical profiles of the oceans
- 4. Thermohaline circulation (SW ch.4, O.Cir ch.5)**
  - Deep water masses
  - Deep water currents
- 5. Sea water composition (SW ch.3,6, O.Chem ch.2 )**
  - Salinity of sea water
  - Chemical composition of sea water
  - Classification of elements in sea water according to behavior
  - Nutrients and productivity of sea water
  - The carbon and oxygen systems
  - The chemical profiles of the oceans
- 6. Marginal basins**
  - Circulation and biogeochemistry of lagoons and estuaries
- 7. Controlling processes**
  - Dynamic equilibrium in the ocean
  - Flux
  - Residence time
  - Mass balance of selected elements

Bibliography

The Open University (1989) Seawater: Its Composition, Properties and Behavior (SW) (See chapters below)

The Open University (OU-b) (1989) Ocean Chemistry and Deep Sea Sediments (O.Chem) (See chapters below)

The Open University (1989) Ocean Circulation (O. Cir) (See chapters below)

Course Requirements

3 hr lecture / tutorial