



AN INTRODUCTION TO METEOROLOGY AND OCEANOGRAPHY

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| Lecturers : 18.0 | TC : 0.0 | PW : 0.0 | Autonomy : 0.0 | Study : 14.0 | Project : 0.0 | Language : AN

Objectives

The aim of this course is to provide a physical understanding of large-scale oceanic and atmospheric circulations, and the practical consequences of such systems. Large-scale movements are the result of the interaction between thermodynamic imbalances - driven by solar radiation - and the Earth's rotation. Therefore, these two processes are first studied before being combined to explain the functioning of large-scale meteorological and oceanic systems. The problem of climate change will also be discussed.

Keywords : Oceanography, meteorology, currents, waves, tides, solar radiation, Coriolis, Ekman, Froude, Rossby, Sverdrup, Taylor

Programme

1. Introduction

The composition and the physico-chemical properties of the atmosphere and the ocean. The distribution of water over the surface of the earth.

2. Heat transfer in the atmosphere and the ocean

Solar radiation, radiative exchanges between earth and atmosphere; sensible heat transfer, stratification and stability

3. The effects of rotation

Learning outcomes

- Understand the different physical processes which drive motion in the atmosphere and ocean
- Be able to identify the different processes involved in the exchange of mass, momentum and heat between the ocean and the atmosphere
- Be able to estimate the importance of different physical processes through order-of-magnitude calculations
- Be able to explain the phenomena represented on a meteorological chart

Independent study

Objectifs :

Méthodes :

Core texts

Gill, Adrian, *ATMOSPHERE AND OCEAN DYNAMICS*, Academic Press, 1982

Pedlosky, Joseph *GEOPHYSICAL FLUID DYNAMICS.*, Springer Verlag, 1987

Pond, Stephen. & Pickard, George L. *INTRODUCTORY DYNAMICAL OCEANOGRAPHY*, Butterworth-Heinemann, 1983

Assessment

Knowledge 50% + Know-how 50%

Knowledge = 40% Final exam + 60% Continuous assessment

Know-how = 40% Final exam + 60% Continuous assessment