

# **Corso di Studi: “Biology and Ecology of Marine Environment and Sustainable Use of its Resources”**

## **Titolo dell’insegnamento:**

**“Oceanografia fisica e chimica (e biologica) con laboratorio pratico”**

**“Physical and Chemical (and some Biological) Oceanography with laboratory practice”**

**Anno accademico 2017/18**

## **Programma**

Storia

Vocabolario

Promemoria di calcolo elementare

Fisica oceanica

Masse d'acqua

Interazioni aria-mare e bilanci idrici

Dinamiche oceaniche

Ottica marina

Rilevamento remoto

Chimica oceanica

Composizione dell'acqua di mare

Acqua di mare come soluzione elettrolitica

Il ciclo del carbonio oceanico

Macro e micro-nutrienti

Introduzione agli isotopi stabili

Accoppiamento fisico-biologico

Movimento fluido e plancton a diverse scale

Fotosintesi acquatica

Risposta biotica alla dinamica verticale nello strato superiore

L'impatto dei processi fisici sulla biogeografia dell'oceano

## **Contents**

History

Vocabulary

Elementary calculus reminder

Ocean Physics

Water masses

Air-sea interactions and water budgets  
 Ocean dynamics  
 Marine optics  
 Remote sensing  
 Ocean Chemistry  
 Composition of sea water  
 Sea water as an electrolytic solution  
 The ocean carbon cycle  
 Macro- and micro-nutrients  
 Introduction to stable isotopes  
 Physical-Biological Coupling  
 Fluid motion and plankton at different scales  
 Aquatic photosynthesis  
 Biotic response to the vertical dynamics in the upper layer  
 The impact of physical processes on the biogeography of the ocean

## Supplementary materials and books

- Anderson, L. A. and Sarmiento, J. L.: Redfield ratios of remineralization determined by nutrient data analysis, *Global biogeochemical cycles*, 8, 65–80, 1994.
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