

## DEREE COLLEGE SYLLABUS FOR:

**OC 1001 LIFE IN THE OCEANS**  
(Updated Spring 2012)

3/1½/4

**PREREQUISITES:** None

### **CATALOG DESCRIPTION:**

Principles of chemical and biological oceanography with emphasis on chemical and biological processes, the properties and origin of water and salts, major constituents, dissolved gases and nutrients, the carbon dioxide system, coastal processes, the biological productivity of the oceans, ecology, distribution and classification of marine organisms, ocean resources and ocean pollution.

### **RATIONALE:**

Life in the Oceans is a science course with laboratories that fulfills the general education requirement in science. It is designed for students with little background in the natural or physical sciences and aims at giving them an understanding of the scientific study of seas and oceans. Recent developments in the field of chemical and biological oceanography are discussed, such the origin of water and salts on earth, the chemical constituents of seawater, phyto and zoo-plankton, the richness, diversity and classification of marine life, marine pollution and coastal management and management of marine ecosystems.

**LEARNING OUTCOMES:** As a result of taking this course, the student should be able to:

1. Acquire a foundation in the science of Oceanography. **(Knowledge)**
2. Demonstrate knowledge of the scientific method, core oceanography concepts and principles. **(Knowledge)**
3. Acquire knowledge on water chemistry and biological chemistry, biological productivity, ocean resources and pollution.  
**(Knowledge, Analysis, Evaluation)**
4. Understand scientific issues and concerns as they apply to students, their environment, society and health, and to understand how to use their knowledge responsibly. **(Knowledge, Analysis, Evaluation, Application)**
5. Demonstrate detailed understanding of the various life forms of the seas and the oceans and of the distribution and classification of major marine phyla and classes **(Knowledge, Analysis, Evaluation, Key transferable skills)**
6. Develop the necessary analytical tools to understand the nature of scientific inquiry by practicing inquiry in the laboratory and in the field and by addressing the right questions and applying the appropriate methodology. **(Key transferable skills, Practical skills)**

**METHOD OF TEACHING AND LEARNING:**

In congruence with the learning and teaching strategy of the college, the following tools are used:

- Class lectures, interactive learning (class discussions, group work) film and video presentations
- Exercises and primary source documents are assigned as homework, the solutions of which are reviewed in class
- Class discussion of selected topics.
- Research through the Internet
- CD-ROMs and physical models.
- Laboratory experiments and/or demonstrations, reports.
- Field trips and/or visits.
- Information Course Center-Course Link: <http://highered.mcgraw-hill.com/sites/0073376701/>
- Office hours: students are encouraged to make full use of the office hours of their instructor, where they can ask questions, see their exam paper, and/or go over lecture/lab material.
- Use of a blackboard site, where instructors post lecture notes, assignment instructions, timely announcements, as well as additional resources.

**ASSESSMENT:**

Multiple "diagnostic" tests – <b>formative (on-line)</b>	0	Multiple choice/short answers/ /essay questions combination
In-class midterm examination (2-hour) - <b>summative</b>	30	Multiple choice/short answers/ /essay questions combination/ problem solving
Final examination (2-hour) - <b>summative</b>	45	Multiple choice/short answers/ /essay questions combination/ problem solving
Lab Reports	25	Data analysis and evaluation of all lab activities
<b>Total of all Exams</b>	<b>100</b>	

The formative on-line tests aim to prepare students for the examinations. Students are expected to submit feedback on their performance.

The lab reports assess the practical component of the course Learning Outcome 6.

The midterm examination tests Learning Outcomes 1, 2, 3

The final examination tests Learning Outcomes 4, and 5

**READING LIST:**

Textbook:Sverdrup, Keith A., An introduction to the worlds Oceans 10/E or latest edition. McGraw Hills, ISBN: 139780073376707

Instructor’s Lab Manual for OC 1001 posted on blackboard

**SOFTWARE REQUIREMENTS:**

Microsoft Word, Microsoft PowerPoint, Blackboard CMS.

**COMMUNICATION  
REQUIREMENTS:**

Word, Excel, PowerPoint, Internet

**WWW RESOURCES:**

[www.sciamcom](http://www.sciamcom)  
[www.nature.com](http://www.nature.com)  
[www.ncmr.gr](http://www.ncmr.gr)  
[www.imbc.gr](http://www.imbc.gr)  
[www.whoi.edu/oceanus](http://www.whoi.edu/oceanus)  
[www.jbpub.com/oceanlink](http://www.jbpub.com/oceanlink)  
[www.scibib.ucsd.edu](http://www.scibib.ucsd.edu)  
[www.aquanet.com](http://www.aquanet.com)  
[www.nodc.noaa.gov](http://www.nodc.noaa.gov)

- INDICATIVE CONTENT:**
1. Beaches, Seas and Estuaries
    - 1.1. Beach processes
    - 1.2. Long shore transport
    - 1.3. The Mediterranean and the Black Sea
    - 1.4. Estuaries
  2. The Physical and Chemical Properties of Seawater
    - 2.1. Structure and properties of water
    - 2.2. Changes of State, Heat Capacity
    - 2.3. Density and Dissolving Ability
    - 2.4. Energy Transmission
    - 2.5. Ice
    - 2.6. Sources of salts
    - 2.7. Major constituents and salinity
    - 2.8. Dissolved gases
    - 2.9. Nutrients and trace elements
  3. Productivity and Life in the Oceans
    - 3.1. Nutrients and productivity
    - 3.2. Geographical and seasonal variations of productivity
    - 3.3. Marine food chains
    - 3.4. The classification of marine organisms
    - 3.5. Plankton
    - 3.6. Nekton
    - 3.7. Benthos
  4. Marine Pollution
    - 4.1. Population growth and coastal development
    - 4.2. Pollution sources and mechanisms
    - 4.3. Eutrophication

**LAB OUTLINE:**

1. Laboratory Safety. Rules and Regulations. Use of the Microscope
2. General Ocean Chemistry
3. Salinity Variations
4. Sea Water Nutrients, Water Hardness, pH, Dissolved Oxygen
5. The Kingdoms of Life
6. Phytoplankton Identification
7. Zooplankton Identification
8. Case Study of a Marine Organism
9. Field Activities:
  - Seawater Sampling & Measurements (determination of dissolved Oxygen, nutrients N, P, salinity, pH) with the use of portable chemical analysis kits
  - Environmental State of the Sea (Macroscopic pollution factors, seaweeds sampling & recognition, eutrophication)
  - Sediment Collection, Description & Classification
  - Shell Recognition & Classification
  - Plankton Sampling and Seawater Transparency with Seiki Disk Index
  - Position Finding, Use of Compass & GPS
10. Field Data Processing and Interpretation
11. Analysis and Evaluation of Field Trip Activities
12. Video-Documentary Presentation
13. Students use this lab session to prepare their lab reports