COURSE DISCRIPTION

1. GENERAL

SCHOOL	ENVIRONMENT, GEOGRAPHY AND APPLIED ECONOMICS		
DEPARTMENT	GEOGRAPHY		
LEVEL OF COURSE	UNDERGRADUATE		
COURSE CODE	ΓΕ0901	**SEMESTER**	5th
COURSE TITLE	OCEANOGRAPHY		

STRUCTURE OF TEACHING ACTIVITIES	**TEACHING HOURS PER WEEK**	**NUMBER OF CREDITS ALLOCATED (ECTS)**
Lectures and Laboratory Classes	3	5

TYPE OF COURSE	Compulsory
PREREQUISITES	-
LANGUAGE OF INSTRUCTION	GREEK
COURSE OFFERED TO ERASMUS STUDENTS	YES (in English if required)
(URL)	https://eclass.hua.gr/courses/GEO169/

2. EXPECTED LEARNING OUTCOMES

Learning outcomes

Describe the objectives of the course as well as the expected learning outcomes

The course "Oceanography" aims to help students to understand the natural, chemical, geological and biological processes in the world ocean. Another objective is to understand the process of the evolution of the world's ocean over time, its characteristics and its importance in shaping the climate, the living parameters and the natural and man-made environment.

In this course the student:

- acquires knowledge that allows him/her to approach basic oceanographic issues,
- learns to choose the methods and techniques that will enable him/her to study the marine and oceanic physical systems as well as the human impact on them,
- develops skills regarding the drawing of bathymetric sections and the exploitation of relevant web applications,
- becomes familiar with processing and interpreting primary data and drawing conclusions on the physical and chemical properties of ocean waters.

3. COURSE CONTENTS

Classroom Lectures:

The course is structured in three sections:

1. Introduction of students in the scientific field of Oceanography and analysis of geographic and geomorphological characteristics of oceans and seas, as well as the physico-chemical properties of seawater. Particular emphasis is given to the surface and deep distribution of the physico-chemical properties of seawater, as well as to their time variations. A brief reference is made to the scientific resources available to scientists for monitoring the properties of seawater and mapping the seabed geomorphology.
2. Ocean circulation and natural mechanisms that cause it. Brief reference to the structure of the atmosphere and the hydrosphere and the circulation of the winds. Focus on the ocean circulation through sea currents, and analysis of sea waves and tides.
3. A reference to the living marine environment as well as to the pollution of the oceans due to human activities. Understanding the degree of interaction of ocean floor geomorphology with physicochemical conditions, with marine organisms, and humans through the food chain.

Laboratory Class:

1. Exercise related to the bathymetry and geomorphology of marine areas. In particular, construction of a bathymetric map in a selected marine area and design of bathymetric cross-sections. Construction of bathymetric cross-sections for selected marine areas of the Mediterranean and Greece, utilizing open source data found in the internet, and identification of the main subaqueous geomorphic features. Use of the sea and ocean floor topography, freely available from the European Marine Web Site http://portal.emodnet-bathymetry.eu/ created by the EU, to study the seas of Europe.
2. Reading, describing and commenting on global maps of distribution of surface temperature and salinity of the oceans. Construction of isothermal curves, based on temperature measurements at different depths and discussion of the depth distribution of the water temperature. Determination of the thickness of the surface mixed layer, the thermocline zone and the identification of current types. Construction of equal salinity curves based on temperature measurements in areas of interest, and identification of high salinity areas. Recovering data on temperature and salinity for selected Mediterranean and Greek marine areas, utilizing open internet sources, (http://portal.emodnet-bathymetry.eu/).
3. Study of sea waves in the coastal area. Calculation of the breaking height and the depth of wave breaking on a beach, for waves propagating perpendicularly to the isobaths and for waves propagating at an angle to the isobaths.
4. Searching for sea-level fluctuations (daily, weekly and monthly) from the relevant UNESCO Worldwide and Regional Networking Networks, which provides real-time information (http://www.ioc-sealevelmonitoring.org/map.php) . Observations from six different stations and correlating their measurements with the global distribution of tidal range. Study of a scientific article (in Greek) relevant to the rise of sea-level, in order for the students to understand and answer simple questions.

4. TEACHING AND ASSESSMENT METHODS

TYPE OF LECTURES	• In class lectures

<table>
<tr><td></td><td>• Laboratory Lectures and Practice</td></tr>
<tr><td>ICT USE</td><td>ICT use, Internet use and eclass</td></tr>
<tr><td>TEACHING STRUCTURE</td><td>
<table>
<tr><th>Activity</th><th>Hours per semester</th></tr>
<tr><td>Lectures</td><td>13</td></tr>
<tr><td>Laboratory</td><td>26</td></tr>
<tr><td>Weekly assignments</td><td>41</td></tr>
<tr><td>Studying – personal work</td><td>45</td></tr>
<tr><td>TOTAL</td><td>125</td></tr>
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<tr><td>ASSESSMENT METHODS</td><td>Assessment Language: Greek

Assessment Methods
Written examination at the end of the semester (3 hours multiple choice test) providing the 70% of the final grade.

Evaluation of the weekly submitted laboratory exercises provides the 30% of the final grade.

The evaluation criteria are announced at the beginning of the semester.</td></tr>
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5. RECOMMENDED READING

Books

Albanakis, K., 1999. Lessons of Oceanography. University Studio Press.

Garrison T., 2007. Oceanography: an invitation to marine science. Thomson Brooks/Cole, Belmont, USA.

Theodorou, A., 2004. Oceanography: Introduction to the Marine Environment. Stamoulis Publications.

Karymbalis, E., 2010. Coastal Geomorphology. ION publications.

Thurman, H.V., 2001. Introductory Oceanography. Prentice Hall.

Journals

Mediterranean Marine Science, Hellenic Centre for Marine Research

Regional Studies in Marine Science, Elsevier

Marine Geology, Elsevier

Journal of Oceanography, Springer