

COURSE DISCRIPTION

1. GENERAL

SCHOOL	ENVIRONMENT, GEOGRAPHY AND APPLIED ECONOMICS		
DEPARTMENT	GEOGRAPHY		
LEVEL OF COURSE	Undergraduate		
COURSE CODE	ΓΕ0901	SEMESTER	5 th
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://www.geo.hua.gr/en/module/oceanography/		

2. EXPECTED LEARNING OUTCOMES

Learning outcomes <i>Describe the objectives of the course as well as the expected learning outcomes</i>
<p>The course "Oceanography" aims to help students understand the physical, chemical, geological, and biological processes in the global ocean. Additionally, it seeks to provide an understanding of the evolution of the global ocean over time, its characteristics, and its significance in shaping the climate, biotic parameters, and the natural and human-made environment.</p> <p>In the context of this course, the student:</p> <ul style="list-style-type: none"> ● Acquires knowledge that enables them to approach fundamental oceanographic issues, ● Learns to choose the methods and techniques that will allow them to study marine and oceanic physical systems as well as human impacts on them, ● Develops skills in designing bathymetric sections and utilizing relevant online applications, ● Familiarizes themselves with the processing and interpretation of primary data, and ● Draws conclusions regarding the physical and chemical properties of ocean waters. <p>The course aims to:</p> <ul style="list-style-type: none"> ● Search, analyze, and synthesize data and information, using the necessary technologies ● Independent work ● Respect for the natural environment

3. COURSE CONTENTS

Theory: The course is structured into three sections:

1. Introduction of students to the scientific field of Oceanography. Analysis of the geographic and geomorphological features of oceans and seas, as well as the physicochemical properties of seawater. Special emphasis is placed on the surface and deep distribution of the physicochemical properties of seawater and their temporal variations. A brief reference is made to the technological tools available to scientists for monitoring seawater properties and mapping the geomorphology of the seabed.
2. Ocean circulation and the natural mechanisms that drive it. A brief overview of the structure of the atmosphere and hydrosphere and wind circulation. Focus on ocean circulation through marine currents, and analysis of ocean waves and tides.
3. Discussion of the marine living environment and pollution from human activities. Understanding the degree of interaction between the geomorphology of the ocean floor, physicochemical conditions, marine organisms, and consequently, humans through the food chain.

Laboratory Exercises:

1. Exercise related to bathymetry and the geomorphology of marine areas. Specifically, the creation of a bathymetric map for a selected marine area and the design of bathymetric sections. Design of bathymetric sections, utilizing open web sources, in selected areas of the Mediterranean and Greek seas and identifying the main geomorphological characteristics of the underwater terrain. Use of freely available seabed and ocean floor topography from the European marine areas website <http://portal.emodnet-bathymetry.eu/>, created by the EU for the study of Europe's seas.
2. Reading, description, and commentary on global distribution maps of sea surface temperatures and salinity. Construction of isotherm curves based on temperature measurement data at various depths and commentary on its depth distribution. Determination of the thickness of the surface mixed layer, the thermocline zone, and identification of current types. Construction of equal salinity curves based on temperature measurement data in areas of interest, and identification of areas with high salinity. Retrieval of temperature and salinity data using open web sources in selected areas of the Mediterranean and Greek seas <http://portal.emodnet-bathymetry.eu/>.
3. Study of wave activity in coastal areas. Calculation of wave breaking height and depth for waves propagating perpendicularly to the isobaths, as well as for waves propagating at an angle to the isobaths.
4. Searching for sea-level fluctuations (daily, weekly, and monthly) from the UNESCO global and regional sea-level monitoring website, which provides real-time information <http://www.ioc-sealevelmonitoring.org/map.php>. Observations from six different stations and correlation of measurements with the global distribution of tidal range. Study of a scientific article (in Greek) related to sea-level rise, which students can understand and answer simple questions.

4. TEACHING AND ASSESSMENT METHODS

TYPE OF LECTURES	<ul style="list-style-type: none">• In class lectures• Laboratory Lectures and Practice		
ICT USE	Use of electronic tools in the teaching of both the theory and laboratory training (utilization of the internet). Utilization of the (eclass) platform both for education and communication with students.		
TEACHING STRUCTURE	<i>Activity</i>	<i>Hours per semester</i>	
	Lectures	13	
	Laboratory	26	
	Weekly assignments	41	
	Studying – personal work	45	
	TOTAL	127	
ASSESSMENT METHODS	Evaluation methods: <ol style="list-style-type: none">1. Successful written final exam on the theory of the course, which includes a multiple-choice test (70%)2. Evaluation of laboratory exercises (30%) <p>The evaluation criteria are subject to change and will be announced at the beginning of the semester.</p>		

5. RECOMMENDED READING

- Αλμπανάκης, Κ., 1999. Μαθήματα Ωκεανογραφίας. University Studio Press.
 - Garrison T., 2007. Oceanography: an invitation to marine science. Thomson Brooks/Cole, Belmont, USA.
 - Θεοδώρου, Α., 2004. Ωκεανογραφία: Εισαγωγή στο Θαλάσσιο Περιβάλλον. Εκδόσεις Αθ. Σταμούλης.
 - Καρύμπαλης, Ε., 2010. Παράκτια Γεωμορφολογία. Εκδόσεις Ιων.
 - Thurman, H.V., 2001. Introductory Oceanography. Prentice Hall.
- Relevant Scientific Journals:
- Mediterranean Marine Science, Hellenic Centre for Marine Research
 - Regional Studies in Marine Science, Elsevier
 - Marine Geology, Elsevier
 - Journal of Oceanography, Springer