

## COURSE DESCRIPTION

### 1. GENERAL

<b>SCHOOL</b>	ENVIRONMENT, GEOGRAPHY AND APPLIED ECONOMICS		
<b>DEPARTMENT</b>	GEOGRAPHY		
<b>LEVEL OF COURSE</b>	Undergraduate		
<b>COURSE CODE</b>	ΓΕ3020	<b>SEMESTER</b>	6 <sup>th</sup> / 8 <sup>th</sup>
<b>COURSE TITLE</b>	QUATERNARY GEOLOGY - GEOARCHAEOLOGY		
<b>STRUCTURE OF TEACHING ACTIVITIES</b>		<b>TEACHING HOURS PER WEEK</b>	<b>NUMBER OF CREDITS ALLOCATED (ECTS)</b>
Lectures and Laboratory Classes		3	5
<b>TYPE OF COURSE</b>	Optional		
<b>PREREQUISITES</b>	-		
<b>LANGUAGE OF INSTRUCTION</b>	GREEK		
<b>COURSE OFFERED TO ERASMUS STUDENTS</b>	YES (in English if required)		
<b>(URL)</b>	<a href="https://www.geo.hua.gr/en/module/geomorphology/">https://www.geo.hua.gr/en/module/geomorphology/</a>		

### 2. EXPECTED LEARNING OUTCOMES

#### Learning outcomes

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

The course "Quaternary Geology" aims to help students understand the basic characteristics and depositional environments of the Quaternary period. Additionally, it focuses on understanding the climatic and geodynamic processes that took place during the Quaternary period at global, European, and local scales.

Through this course, the trainee:

- Will learn to identify, describe, and classify clastic sediments from different depositional environments.
- Will acquire skills in preparing sediment samples for grain size analysis and micropaleontological analysis.
- Will learn how to perform sampling for dating using the OSL (Optically Stimulated Luminescence) method.

The course aims to:

- Search, analyze, and synthesize data and information, using the necessary technologies.
- Foster autonomous work.
- Promote respect for the natural environment.
- Encourage free, creative, and inductive thinking.

### 3. COURSE CONTENTS

Theory: The course is divided into three sections:

- Introduction to the scientific field of Quaternary Geology and analysis of the sedimentological and stratigraphic characteristics of Quaternary formations. Special emphasis is placed on the sedimentary environments of these formations and their distribution in the terrestrial Greek region. Brief reference to dating methods, with a focus on radiocarbon and optically stimulated luminescence (OSL) dating techniques.
- Analysis of the causes of long-term climatic changes on Earth and description of the periodicity of glacial periods during the Quaternary. Analysis of sea-level fluctuations during glacial and interglacial periods. Description of recent tectonic processes, seismicity, and volcanism in Greece during the Quaternary.
- Evolution of the human species during the Pleistocene and Holocene, and its interaction with physical-geographical and climatic changes.

Laboratory Exercises: Identification, description, and classification of clastic sediments from different depositional environments (channel deposits, river terraces, floodplains, deltaic, and coastal deposits). Sample preparation for grain size and micropaleontological analysis, and sampling for OSL dating. Specifically:

- Drilling core extraction presented in plastic tubes. Microscopic examination of sediments in cores retrieved from different depositional environments, and construction (description) of the sedimentological characteristics of each core section.
- Sediment sampling for the measurement of natural moisture, grain size analysis, paleontological analysis, and dating.
- Measurement of the natural moisture content of samples (weighing, drying, and recording the results).
- Grain size analysis of samples using sieves for the >2mm fraction and grain size analysis using a Laser Scan (Malvern's Laser Mastersizer 3000) of ultra-high resolution for the <2mm fraction. Construction of grain size distributions, processing, and evaluation of the statistical parameters of the grain size curves, and classification of sediments using triangular diagrams.
- Laboratory processing of samples for micropaleontological analysis and observation of processed samples under a stereoscopic microscope for micropaleontological identification.
- Physical and chemical processing of samples to prepare them for dating using the OSL method.

### 4. TEACHING AND ASSESSMENT METHODS

TYPE OF LECTURES	
	● In class lectures

	<ul style="list-style-type: none"> <li>Laboratory Lectures and Practice</li> <li>Teaching in the field (Field trip)</li> </ul>		
<b>ICT USE</b>	ICT use, Internet use and eclass		
<b>TEACHING STRUCTURE</b>	<b>Activity</b>	<b>Hours per semester</b>	
	Lectures	12	
	Laboratory	24	
	Field work	15	
	Weekly assignments	30	
	Studying – personal work	45	
	<b>TOTAL</b>	<b>127</b>	
<b>ASSESSMENT METHODS</b>	<p>Assessment Language: Greek</p> <p>Assessment Methods</p> <p>The final rate of the course is computed by two parts as follows:</p> <p>The basic assessment type of the course is the written examination at the end of the semester (3 hours) providing the 50% of the final grade.</p> <p>Evaluation of the weekly submitted laboratory exercises (50%).</p> <p>The evaluation criteria are announced at the beginning of the semester.</p>		

## 5. RECOMMENDED READING

- Καρκάνας, Π., 2010. Εισαγωγή στη Γεωαρχαιολογία. Εκδόσεις Νεφέλη.
- Brandley, R.S., 1999. Paleoclimatology: reconstructing climates of the quaternary. Academic Press.
- Siegert, M.J., 2001. Ice sheets and Late Quaternary environmental change. Wiley & Sons.
- Walker, M., 2005. Quaternary dating methods. Wiley & Sons.
- Mediterranean Archaeology and Archaeometry, Πανεπιστήμιο Αιγαίου.
- Palaeogeography-Palaeoclimatology-Palaeoecology, Elsevier.
- Geoarchaeology, Wiley.