

## COURSE OUTLINE

### APPLICATIONS OF ARCHAEOGENETICS IN ARCHAEOLOGY, ANTHROPOLOGY AND HISTORY

#### 1. GENERAL

<b>SCHOOL</b>	CLASSICS AND HUMANITIES		
<b>DEPARTMENT/UPS</b>	HUMANITIES / PHILOLOGY, HISTORY AND ANTHROPOLOGY		
<b>LEVEL OF STUDIES</b>	UNDERGRADUATE – LEVEL 6		
<b>COURSE CODE</b>	XXXXX	<b>SEMESTER</b>	8 <sup>TH</sup>
<b>COURSE TITLE</b>	APPLICATIONS OF ARCHAEOGENETICS IN ARCHAEOLOGY, ANTHROPOLOG AND HISTORY		
<b>TEACHING ACTIVITIES</b> <i>If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.</i>	<b>TEACHING HOURS PER WEEK</b>	<b>ECTS CREDITS</b>	
	3	5	
<i>Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.</i>			
<b>COURSE TYPE</b> <i>Background, General Knowledge, Scientific Area, Skill Development</i>	SCIENTIFIC AREA		
<b>PREREQUISITES:</b>	NO		
<b>TEACHING &amp; EXAMINATION LANGUAGE:</b>	GREEK		
<b>COURSE OFFERED TO ERASMUS STUDENTS:</b>	YES		
<b>COURSE URL:</b>	<a href="https://eclass.duth.gr/courses/XXXXXX/">https://eclass.duth.gr/courses/XXXXXX/</a>		

#### 2. LEARNING OUTCOMES

<b>Learning Outcomes</b> <i>Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.</i>	
Upon successful completion of the course, participants will be able to:	
<ul style="list-style-type: none"> <li>• To clearly describe the concept of ancient DNA and its multiple applications within the humanities.</li> <li>• To synthesize information from the continually expanding literature in the field of paleogenetics on key topics in archaeology and human evolution.</li> <li>• To seamlessly integrate archaeogenetics with fields such as anthropology, archaeology, and history to address crucial scientific questions.</li> <li>• To highlight the numerous applications in modern archaeological and anthropological science and to link the close relationship with human evolution.</li> <li>• To describe how archaeogenetics has contributed to the current understanding of major transitions in human history, such as the Neolithic demographic transition.</li> <li>• To interpret archaeogenetic data within a historical, archaeological, and anthropological context.</li> <li>• To present a research paper in English.</li> <li>• Conduct comprehensive literature reviews in the field of archaeogenetics.</li> </ul>	
<b>General Skills</b> <i>Name the desirable general skills upon successful completion of the module</i>	
<i>Search, analysis and synthesis of data and information,</i>	<i>Project design and management</i>
<i>ICT Use</i>	<i>Equity and Inclusion</i>
<i>Adaptation to new situations</i>	<i>Respect for the natural environment</i>
<i>Decision making</i>	<i>Sustainability</i>
<i>Autonomous work</i>	<i>Demonstration of social, professional and moral responsibility and sensitivity to gender issues</i>
<i>Teamwork</i>	<i>Critical thinking</i>
<i>Working in an international environment</i>	<i>Promoting free, creative and inductive reasoning</i>
<i>Working in an interdisciplinary environment</i>	

*Production of new research ideas*

- Search, analysis and synthesis of data and information
- Autonomous work
- Working in an interdisciplinary environment
- Promoting free, creative and inductive reasoning

### 3. COURSE CONTENT

<b>1</b>	Introduction to Archaeogenetics	<ul style="list-style-type: none"><li>• Familiarization with the students and presentation of the course objectives, expected learning outcomes, and requirements</li><li>• Historical overview of paleogenetic research</li><li>• Importance for anthropology, archaeology, and history</li></ul>
<b>2</b>	Structure, Function, and Heredity of DNA	<ul style="list-style-type: none"><li>• Basic introductory concepts</li><li>• Heredity</li></ul>
<b>3</b>	Genes and Their Evolution: Basic Principles of Population Genetics	<ul style="list-style-type: none"><li>• Main mechanisms of evolution</li><li>• Allele frequencies over time</li></ul>
<b>4</b>	Extraction and Preservation of Ancient Genetic Material – Analysis Methods and Laboratory Practices I	<ul style="list-style-type: none"><li>• Ancient DNA (aDNA) characteristics</li><li>• Sampling methodology</li><li>• Next Generation Sequencing (NGS) and applications in ancient DNA</li></ul>
<b>5</b>	Extraction and Preservation of Ancient Genetic Material – Analysis Methods and Laboratory Practices II	<ul style="list-style-type: none"><li>• Quality control of ancient genetic data</li><li>• Statistical analysis and interpretation</li></ul>
<b>6</b>	Human migrations through the lens of genetics – paleoanthropology	<ul style="list-style-type: none"><li>• Early species of the genus Homo</li><li>• Interbreeding with anatomically modern humans</li><li>• Genetic legacy of early species in the present day</li></ul>
<b>7</b>	Human migrations through the lens of genetics – prehistoric period	<ul style="list-style-type: none"><li>• The European hunter-gatherers</li><li>• The Neolithic revolution through the perspective of ancient genetics</li><li>• Transition to the Bronze Age</li></ul>
<b>8</b>	Human migrations through the lens of genetics – historical times	<ul style="list-style-type: none"><li>• Genetic data and migrations (Ancient Greek colonization, Roman Empire, Medieval history and archaeology, migrations from the 5th to the 7th century, etc.)</li><li>• The impact of urbanization on the biological history of populations</li></ul>
<b>9</b>	Social structure and kinship systems in (pre)historic populations through the study of ancient DNA	<ul style="list-style-type: none"><li>• Kinship inference through ancient DNA</li><li>• Social organization of early societies and consanguinity</li><li>• Burial practices and interpretations through the reconstruction of biological kinship</li></ul>
<b>10</b>	Applications of ancient DNA in archaeozoology, paleobotany, and the history of medicine	<ul style="list-style-type: none"><li>• Reconstruction of extinct species</li><li>• Domestication of animals and ancient genetics, synthesis with archaeological data</li><li>• Reconstruction of ancient ecosystems through environmental DNA (eDNA)</li></ul>
<b>11</b>	Reconstruction of the history of pandemics through paleogenetic data	<ul style="list-style-type: none"><li>• Ancient pandemics in antiquity</li><li>• Identification and evolution of ancient pathogens</li><li>• Connecting historical and genetic evidence</li></ul>
<b>12</b>	Project presentations	<ul style="list-style-type: none"><li>• Presentation of student's projects</li><li>• Discussion of results based on contemporary methods and theories</li><li>• Development of presentation and communication skills for research findings</li></ul>
<b>13</b>	Recap	<ul style="list-style-type: none"><li>• Recap and resolving questions</li></ul>

		<ul style="list-style-type: none"> <li>• Student feedback</li> </ul>
--	--	--

#### 4. LEARNING & TEACHING METHODS - EVALUATION

<p align="center"><b>TEACHING METHOD</b></p> <p align="center"><i>Face to face, Distance learning, etc.</i></p>	<ul style="list-style-type: none"> <li>• Face to face</li> </ul>												
<p align="center"><b>USE OF INFORMATION &amp; COMMUNICATIONS TECHNOLOGY (ICT)</b></p> <p align="center"><i>Use of ICT in Teaching, in Laboratory Education, in Communication with students</i></p>	<ul style="list-style-type: none"> <li>• PowerPoint presentations</li> <li>• Interactive platforms for hands-on applications</li> <li>• Student study of supplementary material related to course content</li> <li>• Teaching material, announcements and communication through the eClass platform</li> <li>• Communication with students via email</li> </ul>												
<p align="center"><b>TEACHING ORGANIZATION</b></p> <p><i>The ways and methods of teaching are described in detail.</i></p> <p><i>Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research &amp; analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.</i></p> <p><i>The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.</i></p>	<table border="1"> <thead> <tr> <th align="center"><i>Activity</i></th> <th align="center"><i>Workload/semester</i></th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td align="center">39</td> </tr> <tr> <td>Essay</td> <td align="center">65</td> </tr> <tr> <td>Study and analysis of bibliography</td> <td align="center">41</td> </tr> <tr> <td>Written examination</td> <td align="center">5</td> </tr> <tr> <td>Total</td> <td align="center">150</td> </tr> </tbody> </table>	<i>Activity</i>	<i>Workload/semester</i>	Lectures	39	Essay	65	Study and analysis of bibliography	41	Written examination	5	Total	150
<i>Activity</i>	<i>Workload/semester</i>												
Lectures	39												
Essay	65												
Study and analysis of bibliography	41												
Written examination	5												
Total	150												
<p align="center"><b>STUDENT EVALUATION</b></p> <p><i>Description of the evaluation process</i></p> <p><i>Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others</i></p> <p><i>Please indicate all relevant information about the course assessment and how students are informed</i></p>	<p>Formative</p> <p>Essay (mandatory): 20%</p> <p>Final written examination (Multiple Choice Test): 80%</p> <p>Oral examination upon student's request.</p>												

#### 5. SUGGESTED BIBLIOGRAPHY

<p>Teaching Aids</p> <ul style="list-style-type: none"> <li>• Larsen, CS (2020) Βιολογική Ανθρωπολογία: Ανακαλύπτοντας τις Ρίζες μας.</li> <li>• Βαλάκος , Ε., Γιουλάτος, Δ., Γοργούλης, Β., Παπαγεωργοπούλου, Χ., Φίσκα, Α.,(επιμ). Broken Hill Publishers Ltd, σελ.:776.</li> <li>• Additionally, scientific articles from high-impact journals from the last decade will be used.</li> </ul>
---

## ANNEX OF THE COURSE OUTLINE

### Alternative ways of examining a course in emergency situations

<b>Teacher (full name):</b>	C. PAPAGEORGOPOULOU
<b>Contact details:</b>	<a href="mailto:cpapage@he.duth.gr">cpapage@he.duth.gr</a>
<b>Supervisors: (1)</b>	YES
<b>Evaluation methods: (2)</b>	Laboratory Report: 10% Essay (mandatory): 20% Presentation in audience: 10% Final written examination: 60%
<b>Implementation Instructions: (3)</b>	<p><b>Laboratory Report (10%):</b> This assignment involves students' reports on their laboratory visits and practical training in accordance with laboratory protocols. The assessment focuses on the students' practical skills, such as their ability to adhere to laboratory procedures, as well as the clarity and completeness of the report they submit.</p> <p><b>Essay (compulsory) (20%):</b> This assignment prepares students for writing scientific research papers aimed at publication, and the writing of their thesis. It includes a literature review and original data analysis. The assessment focuses on students' ability to review relevant literature, analyse data, and evaluate the quality, relevance, and originality of their work.</p> <p>The choice of the assignment topic will be made in collaboration with the instructor during the second lecture to ensure adequate time for preparation of the assignment and presentation. The final paper will be submitted via the eClass platform to the instructor.</p> <p><b>Presentation in audience (10%):</b> The public presentation pertains to the presentation of the mandatory assignment through the creation of a PowerPoint presentation by the student. The assessment focuses on the students' ability to present their work clearly, respond to questions, and manage discussions.</p> <p><b>Final written examination (60%):</b> The final written examination evaluates the understanding of the fundamental theories, concepts, and principles of the course. The examination will be conducted in person on a date and time that will be announced in advance, along with the duration and content of the exam.</p>