

COURSE OUTLINE “FORENSIC GENETICS”

1. GENERAL

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| SCHOOL | HEALTH SCIENCES | | |
| DEPARTMENT | MOLECULAR BIOLOGY AND GENETICS | | |
| LEVEL OF STUDIES | ISCED LEVEL 6 | | |
| COURSE CODE | MBG619 | SEMESTER | 6 th and 8 th |
| COURSE TITLE | FORENSIC GENETICS | | |
| TEACHING ACTIVITIES <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> | | HOURS/WEEK | ECTS CREDITS |
| | | 2 | 3 |
| COURSE TYPE <i>Background, General Knowledge, Scientific Area, Skill Development</i> | SCIENTIFIC AREA | | |
| PREREQUISITES: | NO (but it is desirable that the students have successfully completed previous courses in the subject of Genetics) | | |
| TEACHING & EXAMINATION LANGUAGE: | GREEK ENGLISH FOR ERASMUS STUDENTS | | |
| COURSE OFFERED TO ERASMUS STUDENTS: | YES | | |
| COURSE URL: | https://eclass.duth.gr/courses/ALEX01164/ | | |

2. LEARNING OUTCOMES

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| <p>Learning Outcomes <i>Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.</i></p> | | | | | | | | | | | | |
| <p>The objective of this course is to familiarize students with the applications of Genetics in criminology and forensics, but also to show them the links between Genetics and anthropology, archaeology, history. It is also an introduction to the field of forensic science.</p> <p>The course provides theoretical, practical and professional knowledge in the field of genetics, diagnostic and laboratory genetics. It interacts with other undergraduate courses mainly in the subjects of Genetics and Genomics, but also Biology, Biotechnology and Bioethics.</p> <p>Upon successful completion of the course, participants will be able to:</p> <ul style="list-style-type: none"> -recognize the applications of Genetics in criminology and forensics, but also its interaction with other fields such as law, social sciences, anthropology, bioethics -comprehend in depth the principles of Human Genetics and Genomics, heredity, human genetic diversity and physical anthropology -apply the above to specialized questions and the law -recognize, collect and utilize biological material, particularly of forensic origins -be familiar, use and analyze genetic markers -have skills to work in the field and in the laboratory -analyze and present the genetic evidence | | | | | | | | | | | | |
| <p>General Skills <i>Name the desirable general skills upon successful completion of the module</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><i>Search, analysis and synthesis of data and information,</i></td> <td style="width: 50%; border: none;"><i>Project design and management</i></td> </tr> <tr> <td style="border: none;"><i>ICT Use</i></td> <td style="border: none;"><i>Equity and Inclusion</i></td> </tr> <tr> <td style="border: none;"><i>Adaptation to new situations</i></td> <td style="border: none;"><i>Respect for the natural environment</i></td> </tr> <tr> <td style="border: none;"><i>Decision making</i></td> <td style="border: none;"><i>Sustainability</i></td> </tr> <tr> <td style="border: none;"><i>Autonomous work</i></td> <td style="border: none;"><i>Demonstration of social, professional and moral responsibility and sensitivity to gender issues</i></td> </tr> <tr> <td style="border: none;"><i>Teamwork</i></td> <td style="border: none;"></td> </tr> </table> | <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>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> | | | | | | | | | | | | |

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| <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Production of new research ideas</i> | <i>Critical thinking</i> <i>Promoting free, creative and inductive reasoning</i> |
| Search, analysis and synthesis of data and information Adaptation to new situations Decision making Autonomous work Teamwork Working in an international environment Working in an interdisciplinary environment Production of new research ideas Project design and management Equity and Inclusion Respect for the natural environment Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning | |

3. COURSE CONTENT

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| <p>The course content (syllabus) includes the following topics:</p> <ul style="list-style-type: none"> • Introduction and description of course objectives. The use of genetics in criminology and forensics. Interaction with other sciences (law, sociology, anthropology, bioethics). Job prospects in the field. • Heredity, DNA, chromosomes, genome – overview of the principles of Genetics • Human genetic diversity and concepts of physical anthropology • Biological sources of evidence • Biological material at the scene of the crime - collection, labeling, handling and storage • Biological material in violent or sexual crime cases • Biological material in cases of natural disasters or accidents • Isolation, quantification and use of genetic material • STR markers, detection, analysis and use of polymorphisms • SNP markers, identification, analysis and use of polymorphisms • Testing of paternity or other relationship • Markers in the study of kinship, mitochondrial DNA, Y chromosome • Sex identification • Analysis and presentation of genetic evidence, explaining it to the general public. Legal and ethical issues • Animal, microbial and other non-human genetic material in forensics • Certification of testing laboratories • Trends and expected future developments in the field |
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4. LEARNING & TEACHING METHODS - EVALUATION

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| TEACHING METHOD <i>Face to face, Distance learning, etc.</i> | Face to face | |
| USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) <i>Use of ICT in Teaching, in Laboratory Education, in Communication with students</i> | Use of ICT in Teaching, in communicating with students and in practical training. Use of the eClass platform for communication, for organising student essays and homework, for sharing lecture notes, literature. Use of MS Teams for video calls | |
| TEACHING ORGANIZATION <i>The ways and methods of teaching are described in detail.</i> <i>Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research & analysis, Tutoring, Internship (Placement), Clinical</i> | Activity | Workload/semester |
| | Lectures | 60 |
| | Interactive teaching | 5 |

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| <p><i>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> | Bibliographic research & analysis | 10 |
| | Essay preparation and presentation | 15 |
| | Course Total | 90 |
| <p>STUDENT EVALUATION</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>Examinations take place typically in Greek, but can be in English if there is an international audience (e.g. Erasmus+ students).</p> <p>Concluding evaluation in the form of a written examination</p> <p>The examination may contain a mixture of multiple choice questions, true or false questions, short answer questions, longer (essay) questions, problems solving, etc.</p> <p>Students can choose to undertake an optional essay for a bonus on their exam grade.</p> <p>Students are informed about the course requirements, evaluation, assessment, and examination style during the first week; this info is repeated at the last lecture.</p> <p>All relevant information can be found on eClass.</p> | |

5. SUGGESTED BIBLIOGRAPHY

The following bibliography was used in the planning and preparing this course:

- Forensic DNA Typing: Biology, Technology, and Genetics of STR Markers, John M. Butler Ph.D., Academic Press 2 edition (2005)
- An Introduction to Forensic Genetics (Essential Forensic Science), William Goodwin, Adrian Linacre, Sibte Hadi, Wiley-Blackwell; 2nd Edition (2010)
- Practical Skills in Forensic Science, Dr Alan M Langford, Prof John Dean, Prof Rob Reed, Dr David A Holmes, Dr Jonathan Weyers, Dr Allan Jones, Prentice Hall 2 edition (2010)
- Essential Forensic Biology, Alan Gunn, Wiley-Blackwell 2nd Edition (2009)
- Forensic Biology: Identification and DNA Analysis of Biological Evidence, Richard Li, CRC Press 1 edition (2008)
- Blood Evidence: How DNA is Revolutionizing the Way We Solve Crimes, Henry C. Lee, Frank Tirnady, Perseus Books (2003)
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Recommended textbooks through the "Eudoxus" platform (textbooks available in Greek)

1. «Γενετική Ιατροδικαστική», της Μαρίας Γεωργίου (εκδόσεις Παρισιάνου ΑΕ, 1η έκδοση, 2008). Κωδικός Βιβλίου στον Εύδοξο: 41240
2. «Εισαγωγή στη Δικαστική Ανθρωπολογία», του Steven N. Byers (εκδόσεις Παρισιάνου ΑΕ, 3η έκδοση 2010). Κωδικός βιβλίου στον Εύδοξο: 12534156