**COURSE OUTLINE**

1. **GENERAL**

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| **SCHOOL** | School of Health Sciences |
| **ACADEMIC UNIT** | Faculty of Medicine |
| **LEVEL OF STUDIES** | Undergraduate |
| **COURSE CODE** | ΙΑΥ205 | **SEMESTER** | **Α** |
| **COURSE TITLE** | Medical Mathematics |
| **INDEPENDENT TEACHING ACTIVITIES** *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits* | **WEEKLY TEACHING HOURS** | **CREDITS** |
| Lectures | 3 | 3 |
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| *Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).* |  |  |
| **COURSE TYPE***general background, special background, specialised general knowledge, skills development* | General background |
| **PREREQUISITE COURSES:** | No |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | Greek / Greek |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** |  |
| **COURSE WEBSITE (URL)** | http://ecourse.uoi.gr/course/view.php?id=581 |

1. **LEARNING OUTCOMES**

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| **Learning outcomes** |
| *The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.**Consult Appendix A* * *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
* *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
* *Guidelines for writing Learning Outcomes*
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| Doctors and users of healthcare services have roles and responsibilities in decision-making, such as selecting a medication for the treatment of a disease from a wide range of options. Medical decision-making regarding diagnosis, prognosis, and treatment should be evidence-based. The scientific literature provides useful evidence that can aid in the selection of a treatment, taking into account the benefits and side effects with objectivity and transparency. A fundamental aspect in medical decision-making lies in the studies published in scientific journals. It is important for such highly influential publications, such as medical studies, to rely on reliable methodology, and the statistical analysis of their data to be methodologically sound. Therefore, it is crucial for doctors to be able to evaluate the statistical analysis of a study, assess the reliability of the evidence it provides, and decide whether and to what extent decisions can be made based on the conclusions of the study.Upon successful completion of the course, students will: * Become familiar with the statistical terminology and methodology of modern medical literature (books, journals, internet, etc.), aiming at its critical reading.
* Learn how to evaluate the statistical analysis of a study, check the reliability of its results, and make valid decisions based on its conclusions.
* Be able to calculate probabilities.
* Be able to describe a variable using appropriate measures of central tendency and dispersion.
* Be able to recognize the distribution of a physical quantity.
* Understand the concept of hypothesis testing.
* Be able to select the appropriate statistical test for each type of data and understand the conditions for their application.
* Be able to interpret statistical significance (p-value).
* Understand what statistical power is and what it depends on.
* Be able to calculate and interpret a 95% confidence interval for means, differences of means, and ratios of proportions.
* Be able to interpret a correlation coefficient.
* Be able to interpret the results of a linear regression.
* Be able to interpret the results of a logistic regression.
* Be able to interpret survival curves.
* Be able to interpret the results of Cox regression (survival analysis).
* Be able to interpret the characteristics and outcomes of a diagnostic test (sensitivity, specificity, positive/negative predictive value, etc.).
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| **General Competences**  |
| *Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?* |
| *Search for, analysis and synthesis of data and information, with the use of the necessary technology* *Adapting to new situations* *Decision-making* *Working independently* *Team work**Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas* | *Project planning and management* *Respect for difference and multiculturalism* *Respect for the natural environment* *Showing social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism* *Production of free, creative and inductive thinking**……**Others…* |
| * Search for, analysis and synthesis of data and information, with the use of the necessary technology
* Working in an international environment
* Production of new research ideas
* Decision making
* Working in an interdisciplinary environment
* Planning and management of research protocols
* Working independently
* Team work
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1. **SYLLABUS**

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| 1. Variable classification
2. Combinatorics and probability theory
3. Descriptive statistics (measures of central tendency – measures of dispersion – confidence intervals)
4. Distributions (continuous / categorical)
5. Simple comparisons for continuous variables
6. Simple comparisons for discrete / qualitative variables
7. Correlation and linear regression
8. Logistic regression
9. Survival analysis
10. Statistical analysis of diagnostic tests
11. Special topics in data analysis
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1. **TEACHING and LEARNING METHODS - EVALUATION**

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| **DELIVERY***Face-to-face, Distance learning, etc.* | Face-to-face, Distance learning |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY** *Use of ICT in teaching, laboratory education, communication with students* | Digital lectures Slidesecourse |
| **TEACHING METHODS***The manner and methods of teaching are described in detail.**Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.**The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS* |

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| ***Activity*** | ***Workload of each students group (two groups per semester)*** |
| Lectures | 110 |
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| **Total** | **110** |

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| **STUDENT PERFORMANCE EVALUATION***Description of the evaluation procedure**Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other**Specifically-defined evaluation criteria are given, and if and where they are accessible to students.* | * Assessment Language: Greek/English
* Assessment Methods: Midterm and Final Written Exam, consisting of:
	+ Multiple-choice questions
	+ Problem-solving
* Specifically-defined evaluation criteria: Yes (Explanatory note in the summative evaluation document)
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1. **ATTACHED BIBLIOGRAPHY**

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| --- |
| * Principles of Biostatistics: Pagano Marcello, Gauvreau Kimberlee. 1st edition, 2002.
* Αρχές Αποδεικτικής Ιατρικής: Επιδημιολογία, Δημόσια Υγιεινή, Μέθοδοι Έρευνας, Ι. Ιωαννίδης. Εκδόσεις Λίτσας, Αθήνα 2000.
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