**COURSE OUTLINE**

1. **GENERAL**

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| **SCHOOL** | HEALTH SCIENCES | | | | |
| **ACADEMIC UNIT** | BIOLOGICAL APPLICATIONS & TECHNOLOGIES | | | | |
| **LEVEL OF STUDIES** | UDERGRADUATE | | | | |
| **COURSE CODE** | **BEY 202** | **SEMESTER** | | **II** | |
| **COURSE TITLE** | BIOSTATISTICS | | | | |
| **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 and tutorials | | | 3+2 | | 6 |
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| *Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).* | | |  | |  |
| **COURSE TYPE**  *general background,  special background, specialised general knowledge, skills development* | General background. | | | | |
| **PREREQUISITE COURSES:** | None. | | | | |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | Greek. | | | | |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | Yes. | | | | |
| **COURSE WEBSITE (URL)** |  | | | | |

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* | |
| This is a typical introductory course in Statistics, with applications form the biosciences, that aims to develop the statistical way of thinking in tackling problems that arise in the various scientific fields as well as in everyday life. The syllabus is divided into three parts, according to the evolution of Statistics in time: (i) Descriptive Statistics, (ii) Probability Theory (classical and modern) and (iii) Statistical Inference. The objective of part i is to summarize the characteristics of a data set and present them appropriately, so that the data set becomes more comprehensible and meaningful. The material of part ii aims to understanding the concept of probability as a measure of the uncertainty associated with the occurrence a future event and the development of probability models (or probability distributions) for describing everyday situations; so that the probability of an event of interest can be computed quickly, without resorting to the basic principles of probability. Finally, in part iii, various statistical methods are presented illustrating the inductive approach of Statistics in a problem; i.e. the use of the information in a sample to draw conclusions about the unknown population with probabilistic reasoning. Thus, unknown quantities that represent certain important characteristics of the population are estimated and various hypotheses of interest are tested using the sample, so that decisions can be made for the entire population using the sample, with predetermined certainty. The examples-applications and exercises in the three parts are from the biological sciences. | |
| **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. Decision making. Working in an international and interdisciplinary environment. Production of new research ideas. Production of free, creative and inductive thinking. | |

1. **SYLLABUS**

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| 1. **Descriptive Statistics:** the concepts of population, sample and variable in Statistics, tabulation and graphical representation of quantitative and qualitative data, a procedure and the purpose for grouping quantitative data into classes (Sturges’ empirical formula, types of classes or intervals and class boundaries or exact limits), measures of central tendency and variability. 2. **Probability & Probability Distributions:** the notion of probability, sample space and events, definitions and axioms of probability, theorems for the calculations of probabilities, conditional probability and independence, the law of total probability and Bayes’ theorem, random variables and probability distributions, the binomial, Poisson and normal distributions. 3. **Statistical Inference:** the approach for the generalization from a sample to the population using sample statistics and sampling distributions, point estimation (the method of maximum likelihood and the criteria for selecting among possible estimators), The Central Limit Theorem, interval estimation and hypothesis testing, estimations and tests for the parameters of a binomial, normal and Poisson population, estimation and test for the difference between two proportions from independent binomial populations, a test for the equality of variances from two normal populations, estimations and tests for the difference between the means of two independent normal populations, paired-observations comparisons, tests for independence and homogeneity in contingency tables, McNemar’s test for the comparison between two proportions from related binomial populations. |

1. **TEACHING and LEARNING METHODS - EVALUATION**

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| **DELIVERY** *Face-to-face, Distance learning, etc.* | Face-to-face. |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY** *Use of ICT in teaching, laboratory education, communication with students* | **Delivery of extra exercises and solutions using the department’s web page. Immediate communication using e-mail.** |
| **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* | |  |  | | --- | --- | | ***Activity*** | ***Semester workload*** | | Lectures | 40 | | Tutorials | 30 | | Extra exercises (4 sets) | 50 | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | | Course total | ***120*** | |
| **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.* | The evaluation is based on a three hour written examination on solving problems at the end of semester, in the Greek language. |

1. **ATTACHED BIBLIOGRAPHY**

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| *- Suggested bibliography:*  *- Related academic journals:*   1. Pagano, M. and Gauvreau, K., *Principles of Biostatistics*, “Hellin” Publications G. Parikos, Athens 2002 (translation from the original: Ourania Dafni). 2. Papaioannou, T and ferentinos, K., *Medical Statistics and Elements of Biomathematics*, Stamoulis Publications, Athens 2004. 3. Trohopoulos, D., Tzonou, A. and Katsougiani, K., *Biostatistics*, Parisianou A.E. Scientific Publications, Athens 2002. |