COURSE OUTLINE

(1) GENERAL

SCHOOL	**of MEDICINE**		
DEPARTMENT			
LEVEL OF STUDY	**POSTGRADUATE**		
COURSE CODE	**TAO - 202**	**SEMESTER OF STUDY**	**2**
COURSE TITLE	**BIOSTATISTICS**		

INDEPENDENT TEACHING ACTIVITIES *in case the credits are awarded to distinct parts of the course e.g. lectures, laboratory exercises, etc. If the credits are awarded uniformly for the entire course, indicate the weekly teaching hours and the total credits*	**TEACHING WEEKS**	**CREDITS**
	2	6
Add rows if needed. The teaching organization and teaching methods used are described in detail in (d).		

COURSE TYPE *general background, specific background, specialization, general knowledge, skills development*	GENERAL BACKGROUND
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	ENGLISH
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	

(2) LEARNING OUTCOMES

Learning Outcomes

The learning outcomes of the course are described, the specific knowledge, skills and competences of an appropriate level that students will acquire after the successful completion of the course.

Consult Appendix A

- *Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors of Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B*
- *Learning Outcomes Writing Summary Guide*

- The acquisition of solid knowledge of statistical concepts and methods widely used in biomedical research and in the field of Vision Sciences.
- The ability to interpret the results of statistical analyses as well as the documented critical evaluation of the statistical methodology of biomedical publications.

- The acquisition of fluency in the use of the SPSS statistical package for the statistical processing of research data.

General Competencies

Taking into account the general competencies that the graduate must have acquired (as listed in the Diploma Supplement and listed below), which of them does the course aim at?.

Search, analyze and synthesize data and information, using the necessary technologies	*Project planning and management*
Adapting to new situations	*Respect for diversity and multiculturalism*
Decision-making	*Respect for the natural environment*
Autonomous work	*Demonstrate social, professional and ethical responsibility and sensitivity to gender issues*
Teamwork	*Criticism and self-criticism*
Working in an international environment	*Promoting free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Generation of new research ideas	*Other...*
	…….

What skills should the graduate have acquired at the end of the course:

- Briefly describe a dataset with appropriate numerical measures.
- To present data and research results with appropriate tables and diagrams.
- Prepare, organize and manage spreadsheets and data files in statistical packages.
- Use basic statistical inference tools (confidence intervals and p-values) as indicators of uncertainty of research results.
- To select and apply statistical significance tests appropriate to the data under study and in relation to the research questions of the study.
- Select and use appropriate correlation measures of two variables.
- Distinguish between statistical and clinical significance.
- Critically evaluate statistical methodology and the results of published research papers.

(3) COURSE CONTENT

Course content:

- Introduction - Why we need to know basic principles of Biostatistics
- Descriptive Statistics I: Tables of distributions, graphs, morphology of distributions, normal distribution.
- Descriptive Statistics II: Central trend indices, dispersion indices, reference ranges of normal values, Z-scores, tables of probability of typical normal distribution.
- Introduction to statistical inference and inferential statistics: Sample variability, Standard error, Confidence interval, Null hypothesis, p-values, Statistical significance, Clinical significance.
- Introduction to the SPSS statistical data processing and analysis package.
- Hypothesis Tests for Population Mean Values: Basic stages of hypothesis testing, types of errors, validity, t-test in dependent and independent samples, non-parametric Wilcoxonsignedtest, Mann-Whitney U test.
- Linear Correlation & Regression in Bivariate Data.
- Techniques for analyzing qualitative variables. Relative risk, oddsratio. Hi-squared controls and McNemar. Evaluation of diagnostic tests: sensitivity, specificity, positive and negative predictive value.

Published papers to be used as exercises in teaching the course:

- Numerous examples from published biomedical studies are used to highlight the statistical ideas, concepts and methods addressed by the course.

- Data files (or subsets thereof) from faculty research studies are used for the practical part of the course using the SPSS package software.

(4) TEACHING AND LEARNING METHODS - ASSESSMENT

<table>
<tr><td>DELIVERY
METHOD Face to face, Distance learning, etc.</td><td>FACE TO FACE</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES
Use of ICT in Teaching, Laboratory Training, Communication with students</td><td>SUPPORT OF THE LEARNING PROCESS THROUGH THE E-LEARN PLATFORM</td></tr>
<tr><td>TEACHING ORGANIZATION
The method and methods of teaching are described in detail.
Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliography Study & Analysis, Tutorial, Internship (Placement), Clinical Practicing, Art Workshop, Interactive Teaching, Educational visits, Project Writing, Writing a project / assignments, Artistic creation, etc.

The student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles are listed</td><td>
<table>
<tr><th>Activity</th><th>Semester Workload</th></tr>
<tr><td>Lectures and seminars</td><td>30</td></tr>
<tr><td>Non-guided study of teaching materials (slides, videos, applets), and recommended literature</td><td>90</td></tr>
<tr><td>Solving exercises, including self-assessment tests and basic statistical software use exercises.</td><td>50</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course Total:</td><td>170</td></tr>
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<tr><td>STUDENT EVALUATION
Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Summative, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other/Others</td><td>

Self-assessment online quizzes with feedback are available to students per module of the course on the elearn online asynchronous training platform of the University of Crete.
The final grade in the course results entirely from a written examination at the end of the semester. The written final exam includes multiple choice, correct error, and short answer questions, including short computational questions.
Students are assessed on their proven ability to understand the course content as a whole and adapt it to specific cases or scenarios of research studies to solve problems. Students must demonstrate their ability to use, apply and interpret, critically, the bio-statistical

</td></tr>
</table>

Explicitly defined evaluation criteria and whether and where they are accessible to students are mentioned.	concepts, techniques and methods addressed in the course.

(5) RECOMMENDED BIBLIOGRAPHY

1. *Practical Statistics for Medical Research* D.G. Altman, 1991 (links to buy: Public, Amazon) 2. *Medical Statistics A Textbook for the Health Sciences*5th ed. D. Machin, MJ Campbell & Walters, 2021 (link to buy:Amazon,Vasiliadis,Hypokratis) 3. Medical Statistics from Scratch, 4th ed., D. Bowers, 2020 (link to buy:Amazon,Vasiliadis) *Related scientific journals and articles:* Important scientific articles, reviews and book chapters posted on the course website in e-learn or given in the course.