

## COURSE OUTLINE

### (1) GENERAL

<b>SCHOOL</b>	SCHOOL OF INFORMATION SCIENCES & TECHNOLOGY		
<b>ACADEMIC UNIT</b>	DEPARTMENT OF STATISTICS		
<b>LEVEL OF STUDIES</b>	1st Cycle (UNDERGRADUATE)		
<b>COURSE CODE</b>	<b>6118</b>	<b>SEMESTER</b>	<b>7<sup>th</sup></b>
<b>COURSE TITLE</b>	<b>Biostatistics II</b>		
<b>INDEPENDENT TEACHING ACTIVITIES</b>		<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>
Lectures		4	7
Workshops		1	
Labs		1	
<b>COURSE TYPE</b>	Elective		
<b>PREREQUISITE COURSES:</b>			
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	GREEK		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	NO		
<b>COURSE WEBSITE (URL)</b>	<a href="https://www.dept.aueb.gr/en/stat/content/biostatistics-%CE%B9%CE%B9-7-ects">https://www.dept.aueb.gr/en/stat/content/biostatistics-%CE%B9%CE%B9-7-ects</a>		

### (2) LEARNING OUTCOMES

<b>Learning outcomes</b>
<p>Upon successful completion of the course, the students will: Know and understand Survival Analysis. Have acquired knowledge about theory and methods. Practical skills for survival data analysis. Basic and transferable skills for Medical Statistics and Biostatistics.</p>
<b>General Competences</b>
<ul style="list-style-type: none"> <li>• Search, analysis and synthesis of data and information, using the necessary technologies</li> <li>• Adaptation to new situations</li> <li>• Decision-making</li> <li>• Autonomous work</li> <li>• Teamwork</li> <li>• Working in an international environment</li> <li>• Working in an interdisciplinary environment</li> <li>• Generating new research ideas</li> <li>• Project design and management</li> </ul>

- Promoting free, creative and inductive thinking

### **(3) SYLLABUS**

Survival data and their properties. Survival time functions (survival function, risk function, average residual life) and their interrelationships. Survival time parametric models examples: Exponential, Weibull, Log-logistic etc). Nonparametric survival analysis, estimating functions methods: Product-Limit (Kaplan-Meier) and Nelson-Aalen estimators. Standard errors, types of confidence intervals (plain, log, cloglog) and inference. Methods of comparing survival function: Logrank test and generalizations. Extension to more than two samples. Parametric survival analysis: Distribution fitting with the maximum likelihood method. Hypothesis testing, asymptotic theory, types of confidence intervals and inference. Generalization for two samples. Survival analysis with instrumental variables: Cox's model of analog risks, partial likelihood and inference. Accelerated Failure Time model. Model interpretation through Bayesian examples. Survival analysis and frailty. Introduction to clinical trials. Designs (parallel, crossover, cross-sectional, etc.). Sample size and power. Treatment allocation randomization, adjustable designs. Meta-analysis.

#### (4) TEACHING and LEARNING METHODS - EVALUATION

<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	Face-to-face	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b>	YES	
<b>TEACHING METHODS</b>	<b>Activity</b>	<b>Semester workload</b>
	Lectures	80
	Lab Exercise	50
	Tutorial	40
	Self Study	30
	<b>Course Total</b>	<b>200</b>
<b>STUDENT PERFORMANCE EVALUATION</b>	Written examination at the end of the semester: 80% Written Assignment (Project): 20%  Information is available at eclass	

#### (5) ATTACHED BIBLIOGRAPHY

<ul style="list-style-type: none"><li>• Μπερσίμης Σ., Σαχλάς Α., Εφαρμοσμένη Στατιστική με έμφαση στις Επιστήμες Υγείας, Εκδόσεις Τζιόλα, 2016.</li><li>• Μπερσίμης Σ., Σαχλάς Α., Εφαρμοσμένη Στατιστική με χρήση του IBM SPSSStatistics 23, Εκδόσεις Τζιόλα, 2016.</li><li>• PetrieA., SabinC., Ιατρική Στατιστική με μια ματιά, Εκδόσεις Παρισιάνου Α.Ε., 2015.</li><li>• Paganom., GauvreauK., Αρχές Βιοστατιστικής, Εκδόσεις Έλλην, 2002.</li><li>• Ιωαννίδης Ι., Αρχές Αποδεικτικής Ιατρικής, Ιατρικές Εκδόσεις Λίτσας, 2000.</li><li>• Μπεσμπέας (2015) Ανάλυση Επιβίωσης. Σύγγραμμα (150 σελ.).</li><li>• Rosner, B. (2010). Fundamentals of Biostatistics. 7th International edition, Brooks/Cole – Νέα έκδοση θα βγει σύντομα.</li><li>• Armitage, P., Berry, G. and Mathews JNS (2002). Statistical Methods in Medical Research. 4th Edition. Blackwell Science.</li><li>• Hosmer, D. W., Lemeshow, S. and May S. (2008). Applied Survival Analysis: Regression Modeling of Time to Event Data, Second Edition, Wiley-Blackwell.</li><li>• Friedman L.M., Furberg C.D. and DeMets, D.L. (2010). Fundamentals of Clinical Trials. 4th edition, Springer.</li><li>• Collett D. (2003). Modelling survival data in medical research, Second edition. Chapman and Hall.</li><li>• J.F. Lawless (2002). Statistical Models and Methods for Lifetime Data, Second Edition. Wiley.</li><li>• D.R. Cox and D. Oakes (1984). Analysis of survival data. Chapman and Hall.</li><li>• S. Piantadosi (2005). Clinical Trials: A Methodological Perspective Second Edition. Wiley.</li></ul>	
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