

## 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>6023</b>	<b>SEMESTER</b>	<b>4<sup>th</sup></b>
<b>COURSE TITLE</b>	<b>LINEAR MODELS</b>		
<b>INDEPENDENT TEACHING ACTIVITIES</b>		<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>
		4	8
<b>COURSE TYPE</b>		Core - Scientific Field	
<b>PREREQUISITE COURSES:</b>		6012 ESTIMATION AND HYPOTHESIS TESTING	
<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/linear-models-8-ects">https://www.dept.aueb.gr/en/stat/content/linear-models-8-ects</a>	

### (2) LEARNING OUTCOMES

<b>Learning outcomes</b>
<p>Upon completion of the course, students will be able to handle issues related to: correlation coefficient, bivariate and multivariate normal distribution, simple and multiple linear regression, inference in linear regression, hypothesis testing &amp; diagnostics, transformations, general linear model, algorithmic methods of selecting "best" (sub) model multicollinearity and dummy variables.</p>
<b>General Competences</b>
<p>Search for, analysis and synthesis of data and information, with the use of the necessary technology            Adapting to new situations            Decision-making            Production of free, creative and inductive thinking</p>

### (3) SYLLABUS

<p>The purpose of this course is to introduce students to the theory of linear regression and especially to the "correct" implementation. The topics covered include: relationships between continuous variables - correlation coefficient. The bivariate normal distribution.</p>
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Simple linear regression: statistical inference, prediction, hypothesis testing and diagnostics. Transformations and general linear model. Analysis of variance for model selection. Multiple linear regression using matrices. Added variable plots. Selecting "best" (sub)model, generalized F-test. Algorithmic procedures for selecting "best" (sub)model, multicollinearity and dummie variables.

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

<b>DELIVERY</b>	Face to Face	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b>	YES	
<b>TEACHING METHODS</b>	<b>Activity</b>	<b>Semester workload</b>
	Lectures	120
	tutorials	40
	student's study	40
	Course total	<b>200</b>
<b>STUDENT PERFORMANCE EVALUATION</b>	WRITTEN EXAMINATION AT THE END OF THE SEMESTER	

**(5) ATTACHED BIBLIOGRAPHY**

- Κούτρας, Μ. Και Ευαγγελάρας, Χ. (2010). *Ανάλυση Παλινδρόμησης: Θεωρία και Εφαρμογές*, Σταμούλης
- Δ. Στογιάννης, Φ. Σιάννης (2024). *Ανάλυση Παλινδρόμησης*, Εκδόσεις Παπαζήση, ISBN: 978-960-02-4218-8
- Draper N.R. and Smith, H. (1997). *Εφαρμοσμένη Ανάλυση Παλινδρόμησης*, Παπαζήσης
- Montgomery, D.C., Peck, E.A. and Vining, G.G. (2012). *Introduction to Linear Regression Analysis*, Wiley.
- Weisberg, S. (2014). *Applied Linear Regression*, Wiley