

COURSE OUTLINE

1. GENERAL

SCHOOL	ECONOMIC SCIENCES				
DEPARTMENT	ECONOMICS				
LEVEL OF STUDY	Postgraduate				
COURSE UNIT CODE		SEMESTER	1 st		
COURSE TITLE	Quantitative and Computational Methods				
COURSEWORK BREAKDOWN	TEACHING WEEKLY HOURS	ECTS Credits			
Lectures	2	5			
COURSE UNIT TYPE	Compulsory				
PREREQUISITES	NO				
LANGUAGE OF INSTRUCTION/EXAMS:	English				
COURSE DELIVERED TO ERASMUS STUDENTS	NO				
MODULE WEB PAGE (URL)					

2. LEARNING OUTCOMES

Learning Outcomes
<p>Upon successful completion of this module, the student will be able to apply mathematical methods to:</p> <ul style="list-style-type: none"> • Collect, classify, and present data • Describe and combine data • Retrieve, analyze, and synthesize data and information • Draw conclusions based on data • Solve probability problems • Optimize networks, Manage projects <p>Computational techniques for problem solving. Appropriate software will be used for all of the above.</p>
General Skills
<ul style="list-style-type: none"> • - Search, analysis, and synthesis of data and information, using the necessary technologies • - Decision-making • - Independent work • - Working in an interdisciplinary environment • - Generation of new research ideas • - Promotion of free, creative, and inductive thinking

3. COURSE CONTENTS

<p>Introduction – Basic Concepts in Statistics. Descriptive Statistics. Introduction to Probability Theory. Random Variables, distribution functions, discrete and continuous random variables, expectation, variance. Statistical Inference. Statistical software: SPSS.</p> <p>Project Management. Network optimization. Graphs, diagrams, and trees. Critical activities and paths. CPM, PERT. Dynamic Programming.</p> <p>Algorithmic problem solving and programming with MATLAB and Python. Emphasis is given to basic</p>
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programming techniques. Variables, operators/expressions, assignment, input/output. Loops and conditional statements. Matrices: creation and manipulation, searching, sorting. Computer graphics.

4. TEACHING METHODS - ASSESSMENT

MODE OF DELIVERY	online	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Dynamic powerpoint presentations e-class support Communication via e-mail and course discussion group	
TEACHING METHODS	<i>Method description</i>	<i>Semester Workload</i>
	lectures	26
	Individual Assignments	34
	Self-study	65
	<i>Course total (25 hours of workload per ECTs credit)</i>	125
ASSESSMENT METHODS	I. Final examination (50%) I. Individual Assignments (50%)	

5. RESOURCES

- Βασιλειάδης Γ., Καλογηράτου Ζ., Μονοβασίλης Θ., Εισαγωγή στη Στατιστική με Εφαρμογές σε SPSS και EXCEL, (2019), ΕΥΓΕΝΙΑ ΑΣΤ.ΜΠΕΝΟΥ.
- Καραγεώργος Δ., Στατιστική: Περιγραφική & Επαγωγική, Εκδόσεις Σαββάλας, Αθήνα (2010).
- Stephen Bernstein, Element of Statistics I: Descriptive Statistics and probability, Schum's outlines (1998).
- Ψωινός Δ., Ποσοτική Ανάλυση, Εκδόσεις Ζήτη (1996).
- Βασιλείου Π., Εφαρμοσμένος Μαθηματικός Προγραμματισμός, Εκδόσεις Ζήτη (2001).
- Ballou R.H., Business Logistics /Supply Chain Management. 5th Edition, (2004) Prentice Hall.
- Chopra, S., Meindl, P. Supply Chain Management: Strategy, Planning, and Operation. 5th Edition, (2012), Prentice Hall.
- Κολέτσος Ι., Στογιάννης Ζ., Επιχειρησιακή Έρευνα: Θεωρία, Αλγόριθμοι & Εφαρμογές, (2021) Εκδόσεις Συμεών, Αθήνα.
- Κολέτσος Ι., Στογιάννης Ζ., Εισαγωγή στην Επιχειρησιακή Έρευνα, (2021) Εκδόσεις Συμεών, Αθήνα.
- Κώστογλου Β, «Επιχειρησιακή Έρευνα & Οργάνωση Συστημάτων Παραγωγής», Εκδόσεις Τζιόλας (2015).
- Υψηλάντης Π, Επιχειρησιακή Έρευνα, Μέθοδοι και τεχνικές λήψεις αποφάσεων, Εκδόσεις Προπομπός (2015).