

COURSE OUTLINE

(1) OVERVIEW

SCHOOL	MARITIME & INDUSTRY		
DEPARTMENT	INDUSTRIAL MANAGEMENT & TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	TEMA003	SEMESTER	6
COURSE TITLE	SPECIAL TOPICS IN OPERATIONS RESEARCH		
DISCRETE TEACHING ACTIVITIES <i>In cases where ECTS credits are awarded to distinct components of the course (e.g., Lectures, Laboratory Exercises, etc.), please indicate them separately. If the credits are awarded as a whole for the entire course, please state the weekly teaching hours and the total number of credits</i>		WEEKLY TEACHING HOURS	ECTS
Lectures		4	5.5
<i>Please add additional rows if needed. A detailed description of the teaching organization and instructional methods is provided in Section (4).</i>			
COURSE TYPE <i>core (C), core elective (CE), elective (E) - background, specialization, skill development</i>	E - Specialization		
PREREQUISITE COURSES:	None.		
LANGUAGE OF TEACHING AND EXAMINATIONS:	Greek (English for ERASMUS students)		
THIS COURSE IS AVAILABLE TO ERASMUS STUDENTS	Yes		
COURSE WEBPAGE (URL)			

(2) LEARNING OUTCOMES

Learning Outcomes <i>The learning outcomes of the course are described, specifying the particular knowledge, skills, and competencies at the appropriate level that students will acquire upon successful completion of the course.</i> <i>Please refer to Appendix A</i> • Description of the Level of Learning Outcomes for each study cycle according to the Qualifications Framework of the European Higher Education Area. • Descriptive Indicators of Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B. • Concise Guide for Writing Learning Outcomes	
The aim of the course is to familiarize students with the concepts of decision-making using Operations Research. Upon successful completion of the course, the students will be able to: • Describe real decision making problems and determine the steps that they are going to use in order to solve these problems using mainly commercial software packages (problem modeling, methodological approaches and algorithms, interpretation of results, decision implementation). • Describe how they will use the results of the problem data processing. • Identify previous cases that are relevant and can help solve the problem. • Analyze decision making problems and construct mathematical models describing them, taking into account all the parameters and constraints governing the problem of decision. • Choose and apply methodologies appropriate to each case to solve decision problems. • Use the right mathematical software and develop applications on the specific software tools to solve the problems. • Analyze the results of the solution of the mathematical model and propose the solution or solutions to the problem. • Argue for the choice of solution or decision. • Work on Operations Research problems with intensive computer practice.	
General Competences <i>Taking into account the general competences that a graduate should have acquired (as listed in the Diploma Supplement and outlined below), which of these competences does the course aim to develop?</i> <i>Searching, analyzing, and synthesizing data and information, using the necessary technologies</i> <i>Project design and management</i> <i>Respect for diversity and multiculturalism</i>	

<i>Adaptation to new situations</i> <i>Decision making</i> <i>Autonomous work</i> <i>Teamwork</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generation of new research ideas</i>	<i>Respect for the natural environment</i> <i>Demonstration of social, professional, and ethical responsibility and sensitivity to gender issues</i> <i>Exercising critical and self-critical thinking</i> <i>Promotion of free, creative, and inductive thinking</i> ... <i>Other competences: ...</i>
• Searching, analyzing, and synthesizing data and information, using the necessary technologies • Adaptation to new situations • Decision making • Autonomous work • Demonstration of social, professional, and ethical responsibility and sensitivity to gender issues • Exercising critical and self-critical thinking • Promotion of free, creative, and inductive thinking	

(3) COURSE CONTENT

The course covers the following topics:

Week	Topic
1	Introduction to Operations Research
2	Introduction to Linear Programming
3	Special Cases in Linear Programming
4	Sensitivity Analysis
5	Linear Programming Using Computers
6	Transportation and Assignment Problems
7	Dynamic Programming
8	Transportation, Assignment, and Dynamic Programming Problems Using Computers
9	Introduction to Network Models
10	Game Theory Using Computers
11	Queueing Theory
12	Solving Game Theory and Queueing Problems Using Computers
13	Solving Special Problems Using Computers

Students are provided with open-access software. Also, case studies from international bibliography are presented to the students. Furthermore, articles, audiovisual lecture material, web links to useful resources, exercises, and software are uploaded in electronic format on the eClass platform.

(4) TEACHING and LEARNING METHODS - ASSESSMENT

TEACHING MODE <i>Face-to-face, in-class lecturing, distance teaching and distance learning etc.</i>	• Face-to-face in a classroom • Distance teaching & learning (if required)		
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY <i>Use of ICT in Teaching, Laboratory Education, Communication with students</i>	Teaching: Lectures using modern audiovisual equipment, learning support through the eClass electronic platform, synchronous distance teaching via MS Teams. Software: open access software Communication with students: face-to-face during office hours, email, eClass platform, MS Teams tools		
Organization of Teaching <i>A detailed description of the teaching methods and approach is provided.</i>		Activity	Semester Workload
		Lectures	52
		Case studies /exercises	16

Lectures, seminars, laboratory exercises, fieldwork, study and analysis of literature, tutorials, internships (placements), clinical practice, artistic workshops, interactive teaching, educational visits, project work, writing assignments, artistic creation, etc. The student's study hours for each learning activity, as well as the hours of independent study, are specified in accordance with the principles of ECTS	Project	26
	Self-study of lecture material and case studies	41
	Consultation Support	0.5
	Exams (written)	2
	Course Total	137.5
STUDENT ASSESSMENT Description of the assessment process Language of assessment, assessment methods, formative or summative evaluation, multiple-choice tests, short-answer questions, essay questions, problem-solving, written assignments, reports, oral examinations, public presentations, laboratory work, clinical patient examination, artistic interpretation, other(s) Explicitly state assessment criteria and information on whether and where these criteria are accessible to students are included.	Language of Assessment: Greek (English for ERASMUS students) Assessment Mode: Face-to-face and/or distance learning (if required) Assessment Methods: The final grade of the course is determined as follows: • 40% from the project • 60% by the written exams during the spring semester examination period and, in case of failure, during the September resits The written exam includes problem-solving / exercises and/or short-answer questions. It is conducted with closed books. Students with Learning Difficulties: Students with certified learning difficulties in reading and writing (as recognized by the competent authority) are assessed according to the procedures established by the Department. Disclosure of Assessment Criteria: The assessment criteria are communicated during the first class and are clearly stated on the course website and the eClass platform. The exam syllabus is announced on eClass following the final lecture of the semester. The exam answers are posted on eClass after the examinations take place. Students have the right to review their graded exams and receive explanations regarding their grades. In cases of further requests, the procedures outlined in the current Study Regulations apply.	

(5) SUGGESTED BIBLIOGRAPHY

- Books: • Ipsilantis, P. (2015). Operations Research, Propombos Publications, ISBN: 9786185036201 [50659326] – in Greek - Journals: - Other educational material: • Lecture Notes and Supporting Material provided by the Instructor
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