COURSE OUTLINE

1. GENERAL INFORMATION

SCHOOL	MARITIME AND INDUSTRIAL STUDIES
DEPARTMENT	INDUSTRIAL MANAGEMENT AND TECHNOLOGY
LEVEL OF STUDY	UNDERGRADUATE

COURSE UNIT CODE	TEMAΘ03	**SEMESTER OF STUDY**	8th

COURSE TITLE	SPECIAL TOPICS IN OPERATIONS RESEARCH

INDEPENDENT TEACHING ACTIVITIES *in case in which credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	4	5.5
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail at section 4.		

COURSE TYPE *general background, special background, specialized general knowledge, skills development*	General background
PREREQUISITE COURSES:	None
LANGUAGE OF INSTRUCTION and EXAMINATION/ASSESSMENT:	Greek
THE COURSE IS OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	https://eclass.unipi.gr/courses/BDT231/

2. LEARNING OUTCOMES

LEARNING OUTCOMES

The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:

APPENDIX A

- *Description of the level of learning outcomes for each qualifications' cycle, according to the European Higher Education Area's Qualification Framework.*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and APPENDIX B*
- *Guidelines 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 Competencies

Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aims

Search for, analysis and synthesis of data and information, by the use of technologies that are necessary according the case	*Project planning and management*
	Respect for difference and multiculturalism
	Environmental awareness
Adapting to new situations	*Social, professional and ethical responsibility and sensitivity to gender issues*
Decision-making	
Independent work	*Critical consciousness, criticism and self-criticism*
Team work	*Development of free, creative and inductive thinking*
Working in an international environment	
Working in an interdisciplinary environment	
Introduction of innovative research	

- Search for, analysis and synthesis of data and information, by the use of technologies that are necessary according the case
- Adapting to new situations
- Decision-making
- Independent work
- Social, professional and ethical responsibility and sensitivity to gender issues
- Critical consciousness, criticism and self-criticism
- Development of free, creative and inductive thinking

2. COURSE CONTENT

Analytics and decision modelling are two key components of business analytics. They provide decision makers with the fundamental rationality in evaluating performance, making decisions, designing strategies, and managing risk. The course is computer based. There will be software assignments where MS EXCEL and/or LINDO will be used to solve several OR problems. The course focuses on:

- popular decision models arising from real applications
- mathematical decision-making tools and concepts
- business themes, such as airlines, finance, healthcare, games etc.
- real-world applications

3. TEACHING METHODS - ASSESSMENT

TEACHING MODE *Face-to-face, in-class lecturing, on distance teaching and distance learning etc.*	In-class lecturing
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY *Use of ICT in Teaching, Laboratory Education, Communication with students*	**Teaching:** Lectures with audiovisual media, support of the learning process through the eclass platform **Laboratory Education**: Use of commercial software, i.e. MS Excel **Communication with students:** face-to-face at office hours, email, eclass

	COURSE DESIGN	Activity / Method	Semester Workload
Description of teaching techniques, practices and methods: *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, clinical practice, Art Workshop, Interactive teaching, Educational visits, project, Essay writing, Artistic creativity, etc.*		Lectures	52
		Case studies/Exercises	26
		Self-study of lecture material and exercises	57
		Counselling	0.5
		Exams (written)	2
The study hours for each learning activity as well as the hours of non- directed study are given according to the principles of the ECTS		Course Total	*137.5*

STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS	
Detailed description of the evaluation procedures: *Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice questionnaires, short- answer questions, open-ended questions, problem solving, written work, Essay/report, oral exam, public presentation, laboratory work, art interpretation, other……etc*	**Language of exams:** Greek **Assessment Methods:** After the last lecture, the exam material is posted at eclass. The final course grade is formed as follows: • By the laboratory reports (40%) • By the 2-hour written exams (60%) taken in the examination period of the fall semester and, in case of failure, in the September resits The written examination includes problem solving / exercises and/or short-answer questions. The exam is closed book. The evaluation of students with special learning difficulties in writing and reading (as certified and qualified by a competent institution) is performed according to the relevant procedure decided by the Department Assembly.
Evaluation criteria are specifically defined and given as well as if and where they are reported and accessible to students.	**Notification of the Assessment Criteria:** The evaluation criteria are made known during the first lecture and are clearly stated on the course website and e-class. The answers to the exam questions are posted at eclass after the exam date. Students have the opportunity to discuss their exam paper with the course instructor (at the posted office hours) after the announcement of the course grades.

4. SUGGESTED BIBLIOGRAPHY

-Suggested Bibliography :

- Οικονόμου Γ. και Γεωργίου, Α.Κ. (1999). *Ποσοτική Ανάλυση για τη Λήψη Διοικητικών Αποφάσεων*, Τόμοι Α και Β, Εκδόσεις Μπένου, Αθήνα.
- Καρκαζής Ι. (1998). *Ειδικά Θέματα Επιχειρησιακής Έρευνας*. Εκδόσεις Κ. και Π. Σμπίλιας: «Το Οικονομικό», Αθήνα.
- Hillier, F.S. Lieberman, G.J. (1985). *Εισαγωγή στην επιχειρησιακή έρευνα* (μετάφραση: Οικονόμου , Γεώργιος). Εκδόσεις Παπαζήσης, Αριθμός DEWEY: 658.4034, (ISBN αγγλόφωνου βιβλίου: 0-07-113989-3).
- Lawrence, J. and Pasternack, B.A. (2002) Applied Management Science: Modelling, Spreadsheet Analysis, and Communication for Decision Making, 2nd Edition

-Scientific Journals: not applicable
-Lecture Notes