

## COURSE OUTLINE

### 1. GENERAL

<b>SCHOOL</b>	Of Engineering		
<b>DEPARTMENT</b>	of Environmental Engineering		
<b>LEVEL OF STUDIES</b>	First cycle		
<b>COURSE CODE</b>	TMC186	<b>SEMESTER</b>	9th
<b>COURSE TITLE</b>	Operational Research		
<b>TEACHING ACTIVITIES</b>		<b>TEACHING HOURS PER WEEK</b>	<b>ECTS CREDITS</b>
		4	5
<b>COURSE TYPE</b>	Compulsory		
<b>PREREQUISITES:</b>			
<b>TEACHING &amp; EXAMINATION LANGUAGE:</b>	Greek		
<b>COURSE OFFERED TO ERASMUS STUDENTS:</b>	No		
<b>COURSE URL:</b>	<a href="https://eclass.duth.gr/courses/TMC186/">https://eclass.duth.gr/courses/TMC186/</a>		

### 2. LEARNING OUTCOMES

#### Learning Outcomes

The aim of the course is to introduce students to the basic concepts of OR and to give them the ability to apply this knowledge and understanding to problem solving that they are likely to encounter as engineers.

#### General Skills

Search, analysis and synthesis of data and information,  
 ICT Use  
 Decision making  
 Autonomous work  
 Teamwork  
 Production of new research ideas  
 Project design and management

### 3. COURSE CONTENT

1. Introduction to operational research.
2. The basics of linear programming (LP). The general LP problem. Interpretation & mathematical modeling.
3. Graphical LP solution.
4. LP solution with Excel Solver.
5. Sensitivity Analysis.
6. The Simplex Method.
7. Transportation Models
8. The Assignment Model (The Hungarian Method)
9. Critical path (CPM) Computations
10. Pert Calculations

#### 4. LEARNING & TEACHING METHODS - EVALUATION

<b>TEACHING METHOD</b>	Face to face
<b>USE OF INFORMATION &amp; COMMUNICATIONS TECHNOLOGY (ICT)</b>	The lectures are uploaded on the e-class platform in the form of pdf files. Use of ICT in Teaching (power point, Geogebra, Excel etch.) . Communication with students through the platform e-class.
<b>TEACHING ORGANIZATION</b>	Lectures
<b>STUDENT EVALUATION</b>	Written examination at the end of the semester

#### 5. SUGGESTED BIBLIOGRAPHY

- Elements Of Operational Research for engineers, B. Tsihrintzis, National Technical University of Athens
- Operations Research: An Introduction Book, Hamdy A. Taha, Translation S. Katsabounis, Tziolas, ISBN 978-960-418-691-4
- Introduction to Operational Research, I. Koletsos and D. Stogiannis , Symeon, ISBN 978-960-9400-62-6

## ANNEX OF THE COURSE OUTLINE

### Alternative ways of examining a course in emergency situations

<b>Teacher :</b>	Garyfallos Papaschinopoulos / Gesthimani Stefanidou
<b>Contact details:</b>	<a href="mailto:gstefani@env.duth.gr">gstefani@env.duth.gr</a>
<b>Supervisors:</b>	No
<b>Evaluation methods:</b>	Written examination at the end of the semester
<b>Implementation Instructions:</b>	<ul style="list-style-type: none"> <li>➤ The student ought <ul style="list-style-type: none"> <li>• to enroll in platform eclass in the course " Operational Research ",</li> <li>• to use exclusively his/her institutional account for his/her participation in the video conferencing platform and for his entry in eclass,</li> <li>• to shows his / her student ID before the start of the examination or whenever requested.</li> </ul> </li> <li>➤ Digital platforms to be used: <ul style="list-style-type: none"> <li>• simultaneous use of Microsoft Teams and platform eclass</li> </ul> </li> <li>➤ Required technological equipment: <ul style="list-style-type: none"> <li>• Ability to connect to the internet,</li> <li>• use of camera, speakers, microphone,</li> <li>• ability to scan / photograph the manuscript and create a PDF file,</li> <li>• ability to read a GIF (photo) file.</li> </ul> </li> <li>➤ Throughout the exam, the students are connected to Microsoft Teams with an open camera and microphone so that there is seamless visual and audio contact between examiner and examinee. At the same time, they must be able to connect to the eclass to read the exam questions and upload the answers.</li> <li>➤ For the written examination the examinees have <ul style="list-style-type: none"> <li>• To read the examination test that will be posted in eclass in the "Tasks" or in the "Exercises" of the course,</li> <li>• To write their answers on an A4 paper, to digitize it (scan / photograph), to create a PDF file and to upload it to eclass</li> </ul> </li> </ul>