COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF INFORMATION SCIENCES & TECHNOLOGY		
ACADEMIC UNIT	DEPARTMENT OF STATISTICS		
LEVEL OF STUDIES	1st Cycle (UNDERGRADUATE)		
COURSE CODE	**6153**	**SEMESTER**	**5th**
COURSE TITLE	**Introduction to Operational Research**		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	4	7
Workshops/Labs	2	

COURSE TYPE	Elective – General Knowledge
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	
COURSE WEBSITE (URL)	https://www.dept.aueb.gr/en/stat/content/introduction-operations-research-7-ects

(2) LEARNING OUTCOMES

Learning outcomes
After successfully attending the course, the students will be able to solve linear programming problems graphically, with algebraic methods, with the Simplex method and with Excel. They will also be able to find the optimal policy that minimizes the total expected cost for finite-time horizon problems using the method of dynamic programming. They will also be able to find optimal replenishment policies for inventory problems.
General Competences
• Search, analysis and synthesis of data and information, using the necessary technologies • Adaptation to new situations • Decision-making • Autonomous work • Work in an interdisciplinary environment • Respect for diversity and multiculturalism • Respect for the natural environment • Demonstration of social, professional and ethical responsibility and sensitivity to gender issues

- Exercise of criticism and self-criticism
- Promotion of free, creative and inductive thinking

(3) SYLLABUS

The linear programming problem, examples, solution by graphical method, canonical form, properties of solutions, The Simplex algorithm, the M-method, the dual problem of linear programming, sensitivity analysis, the transition problem, the integer programming problem, the dynamic programming problem, the machine maintenance problem, the replacement problem, the Secretary problem. Dynamic Programming, Introduction to Inventory Control.

Numerical solution of practical linear programming problems in the Laboratory using the tool Solver of Excel.

Tutorials that include practical applications of linear programming and dynamic programming.

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Face-to-face</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</td><td>YES</td></tr>
<tr><td>TEACHING METHODS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>130</td></tr>
<tr><td>Studying and Analyzing Bibiography</td><td>15</td></tr>
<tr><td>Assignment</td><td>30</td></tr>
<tr><td>Course Total</td><td>175</td></tr>
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<tr><td>STUDENT PERFORMANCE EVALUATION
.</td><td>Written examination at the end of the semester

Information is available at the Study Guide.</td></tr>
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(5) ATTACHED BIBLIOGRAPHY

- Δ. Φακίνος, Α. Οικονόμου, «Εισαγωγή στην Επιχειρησιακή Έρευνα», Εκδόσεις Συμμετρία, 2003.
- HillierF., S., LiebermanG.J., Εισαγωγή στην Επιχειρησιακή Έρευνα, Τόμος Α΄, Τεύχος Α΄, Εκδόσεις Παπαζήσης, 1985.
- F. S. Hillier, G. J. Lieberman, “Introduction to Operations Research”, McGraw-Hill, 2005.