

COURSE OUTLINE

GENERAL

SCHOOL	School of Science		
ACADEMIC UNIT	Department of Mathematics		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	MAE631	SEMESTER	6 ^o
COURSE TITLE	Linear Programming		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>	WEEKLY TEACHING HOURS	CREDITS	
lectures	3	6	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	special background		
PREREQUISITE COURSES:	No		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)			

LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The course learning outcomes are: the introduction of the students to linear programming formulation, the comprehension of the mathematical properties of linear programming problems, the understanding of the theory underlying the simplex algorithm, the understanding of the dual theory and its interpretation, the use of LINDO software package

to solve linear programming problems.
 Upon successful completion of the course the student will be able to:

1. to model linear programming problems.
2. to solve linear programming problems with the Simplex method.
4. to apply the appropriate modifications of Simplex method when it is necessary.
5. to validate and interpret the results obtained when linear programming problems are solved using LINDO software

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>
<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>
<i>Decision-making</i>	<i>Respect for the natural environment</i>
<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>
<i>Team work</i>	<i>Criticism and self-criticism</i>
<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>
<i>Working in an interdisciplinary environment</i>	<i>Others</i>
<i>Production of new research ideas</i>	

Working independently
 Decision-making
 Adapting to new situations
 Production of free, creative and inductive thinking
 Synthesis of data and information, with the use of the necessary technology

SYLLABUS

Formulating linear programming problems
 Graphical solution
 The Simplex Method
 The bib M method
 The Two-Phase Simplex Method
 Dual theory
 Sensitivity analysis
 Transportation problem
 Assignment problem

TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Lindo Software, Email, class web	
TEACHING METHODS <i>The manner and methods of teaching are described in detail. Lectures, seminars, laboratory</i>	Activity	Semester workload
	Lectures	39
	Independent study	78

<p><i>practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i></p> <p><i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i></p>	Fieldwork (3-4 set of homework)	33
	Course total	150
<p>STUDENT PERFORMANCE EVALUATION</p> <p><i>Description of the evaluation procedure</i></p> <p><i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>LANGUAGE OF EVALUATION: Greek</p> <p>METHODS OF EVALUATION: Final exam (100%)</p>	

ATTACHED BIBLIOGRAPHY

<p>- Suggested bibliography:</p> <ol style="list-style-type: none"> 1. ΒΑΣΙΛΕΙΟΥ Π. και ΤΣΑΝΤΑΣ Ν., Εισαγωγή στην επιχειρησιακή έρευνα, Εκδόσεις ΖΗΤΗ 2000. 2. ΦΑΚΙΝΟΥ Δ. και ΟΙΚΟΝΟΜΟΥ Α., Εισαγωγή στην επιχειρησιακή έρευνα- Θεωρία και Ασκήσεις, Αθήνα 2003. 3. ΚΟΥΝΙΑΣ Σ. και ΦΑΚΙΝΟΣ Δ., Γραμμικός Προγραμματισμός, Εκδόσεις ΖΗΤΗ, Θεσσαλονίκη 1999. 4. ΛΟΥΚΑΚΗΣ Μ. Επιχειρησιακή έρευνα γραμμικός προγραμματισμός, Εκδοτικό Κέντρο Βορείου Ελλάδας, 1994. 5. ΟΙΚΟΝΟΜΟΥ Γ. και ΓΕΩΡΓΙΟΥ Α., ΠΟΣΟΤΙΚΗ ΑΝΑΛΥΣΗ ΓΙΑ ΤΗ ΛΗΨΗ ΔΙΟΙΚΗΤΙΚΩΝ ΑΠΟΦΑΣΕΩΝ, Τόμοι Α και Β, Εκδόσεις Μπένου, Αθήνα 2000. 6. ΟΙΚΟΝΟΜΟΥ Γ. και ΤΣΟΤΡΑ Γ. ΠΟΣΟΤΙΚΗ ΑΝΑΛΥΣΗ ΠΕΡΙΠΤΩΣΕΩΝ, Εκδόσεις Μπένου, Αθήνα 1996

7. ΠΑΠΑΡΡΙΖΟΣ Κ., Γραμμικός Προγραμματισμός. Εκδόσεις Ζυγός, Θεσσαλονίκη 1999.
8. ΣΙΣΚΟΣ Γ., Γραμμικός Προγραμματισμός, Εκδόσεις Νέων Τεχνολογιών, Αθήνα 1998.
9. HAMDY ΤΑΗΑ, Επιχειρησιακή Έρευνα Εκδόσεις Α. Τζιολα & ΥΙΟΙ Α.Ε., 2011
10. HILLIER F. S. and G. J. Lieberman Introduction Operations research. The McGraw-Hill Companies, 2001
11. WINSTON W. L., Operations research (Applications and algorithms). Duxbury Press (International Thomson Publishing) 1994.
12. HADLEY G. Linear Programming, Addison-Wesley Publishing Company, INC, 1965
13. BERTSIMAS D. and J. N. TSITSIKLIS Introduction to Linear Optimization, Athena Scientific 1997
14. GASS S. Linear Programming Methods and Applications, McGraw-Hill 1985

- *Related academic journals:*

Mathematical Programming Journal, Series A and Series B
INFORMS Transactions on Education (ITE)