COURSE OUTLINE

1. GENERAL

SCHOOL	BUSINESS AND ECONOMICS		
DEPARTMENT	BUSINESS ADMINISTRATION		
DIVISION	BUSINESS ADMINISTRATION		
LEVEL OF STUDY	UNDERGRADUATE		
COURSE UNIT CODE	**1108541**	**SEMESTER OF STUDY**	5
COURSE TITLE	Optimisation Methods		

COURSEWORK BREAKDOWN	**TEACHING WEEKLY HOURS**	**ECTS Credits**
Lectures, Workshops and Laboratory Exercises	5	6

COURSE UNIT TYPE	SPECIALIZATION COURSE
PREREQUISITES :	OPERATIONAL RESEARCH
LANGUAGE OF INSTRUCTION/EXAMS:	GREEK
COURSE DELIVERED TO ERASMUS STUDENTS	YES
MODULE WEB PAGE (URL)	http://moodle.teipir.gr/course/info.php?id=64

2. LEARNING OUTCOMES

Learning Outcomes

The management in many cases requires the optimization of parameters related to the operation, production and performance of businesses (maximize or minimize) such as revenue, profit, cost, resource utilisation etc. The Operational Research provides methodological tools which can support business managers in decisions making covering all the aspects (internal and external). The course aims to teach specialized methods of Operations Research and applications for optimisation problems. Students are required to have successfully completed the course "Operations Research " where the basic methods and techniques of Operations Research are taught in order to be able to understand the methods of the course "Optimization Methods".

Upon successful completion of this course, students will be able to:

- Describe administrative decision problems and identify those parameters that affect the case study of optimisation.
- Select the methodology or combination of methodologies to be used to solve the optimisation problems.
- Identify previous cases that constitute good practice and are related to the examined case.
- Analyze decision problems and design analytical models describing them.
- Apply fluently and effectively the appropriate to the case examined methodological frames and techniques.
- Develop applications using the familiar software tools (EXCEL / SOLVER, ENVI, MATLAB) to solve problems.
- Analyze and argue on the results and propose the solution or solutions to the underlying decision problem.
- Evaluate the results and use the appropriate feedbacks of the methodology used for refining of the results.

- Argue for the choice of the proposed decision.

General Skills

- Individual work
- Teamwork
- Decision Making
- Improvement of free, creative and inference thinking
- Search, analysis and aggregation of data and information with the utilisation of the required technology

3. COURSE CONTENTS

- Network Optimisation
  - The Assignment Problem
  - The Transportation problem
  - Optimisation of networks
  - Maximisation of Network Flows
  - The Shortest Path Root problem

- MultiOpbjective Linear Programming
  - Problem Formulation
  - Pay Off table construction
  - Method of satisfactory goals
  - Method of desired goals

- Stochastic Methods
  - Stochastic Modelling
  - Monte Carlo Models
  - Stochastic Linear Programming
  - Stochastic Dynamic Programming
  - Quay Theory
  - Simulation

- Non Linear Programming
  Langrange Method
  Heuristics
  Non Linear Optimisation
    - Optimisation of one variable
    - Multi variables optimasation

The practical part of the course includes the teaching of real world application and the development of applications with specific software (MS EXCEL/SOLVER, LINDO, MATLAB, ENVI)

4. TEACHING METHODS - ASSESSMENT

MODE OF DELIVERY	In-Class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Support of the learning process through the LMS platform of PUAS.# Use of the MS EXCEL, LINDO and ENVI/IDL software Use of software developed by the Teaching Team.

TEACHING METHODS	***Method description***	***Semester Workload***
	Lectures	39
	Class work/Workshop	20
	Preparation of Group Project	25
	Lab Exercises	26
	Independent and Directed Learning	40
	TOTAL	**150**
ASSESSMENT METHODS	**I. Final Examination** (60%) (Summative Evaluation) includes: - Multiple choice questions - Short answer questions - Problems solutions with the taught methods **II. Group Project** (30%) (Summative Evaluation): Course Work in groups of 2 or 3 students. Evaluation Criteria: • Completeness - 35% • Clearness - 25% • Documentation - 30% • Critical Evaluation- 10% **IV. Individual Oral Presentation** (10%) Laboratory Case Study Evaluation Criteria: • Completeness - 35% • Clearness - 25% • Documentation - 30% • Critical Evaluation- 10%	

5. RESOURCES

- Recommended Book and Journal Article Resources:

- Branson Richard, Operational Research, Kleidarithmos Publishers, (in Greek)
- Georgiou A (2008), Non Linear Optimisation Methods, ZHTH Publishers
- Gupta C.B. (2008) Optimisation Methods of Operation Research, I.K. International publishers
- Bertsekas D. (2003) Convex Analysis and Optimisation, Athena Scientific.
- Rardin, Ronald L. (1997). Optimization in operations research, Prentice Hall.

-Recommended Journals:

- European Journal of Operational Research, Elsevier
- Optimisation Methods and Software, Taylor and Francis
- Journal of Optimization Theory and Applications, Springer.