COURSE OUTLINE

(1) GENERAL

SCHOOL	Faculty of Social, Political and Economic Sciences		
ACADEMIC UNIT	Department of Economics		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE		SEMESTER	6th
COURSE TITLE	Decision Theory		
INDEPENDENT TEACHING ACTIVITIES *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*		WEEKLY TEACHING HOURS	CREDITS
	Lectures and Class exercises	4	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General background		
PREREQUISITE COURSES:	Statistics, Mathematics, Management		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	http://www.econ.duth.gr/undergraduate/lessons/st3.shtml		

(2) 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 is an introduction to decision theory mainly by providing the analysis framework for probabilistic models, qualitative and quantitative methods to support decision making process and problem solving. Through a systemic approach and a large variety of case studies the appropriate methodological framework is analyzed. Key emphasis is given in modelling and determine the framework which leads to decisions. The uncertainty is analyzed promoting methodologies of determining optimum and/or satisficing solutions. By a series of real life applications, the decision making process is examined and appropriate methods to specific problems are developed.
The decision models presented in this course are using a wide range of mathematical, graphical and statistical analysis background in order to tackle both uni-criterion and multi-criteria decision making problems with quantitative and/or qualitative data.

Based on above quantitative and/or qualitative analysis framework, the course learning outcomes could be summarized:

- Ability to define the key parameters and variables of a decision-making process
- Ability to choose the appropriate methodology for a decision-making problem
- Ability to analyze and assess the decision-making outputs as well as to review the process results through sensitivity analysis
- Ability of modelling using the appropriate:
    - Decision process, variables, parameters, criteria, attributes
    - Measures for Uncertainty and Fuzziness
    - Alterative scenarios
    - Sensitivity analysis
    - Level of confidence in selected solutions

After a successful course, the students should be able to understand the main issues and techniques in decision making, develop a decision making process and propose solutions, based on:

- Statistical analysis: sampling, estimation, regression analysis
- Decision trees
- Decision making based on game theory
- Fuzzy sets
- Queuing theory
- Scheduling/Sequencing problems: GANT-CPM-PERT
- Utility theory
- Multi-criteria analysis

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?

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

Working in an interdisciplinary environment *Production of new research ideas*	*……* *Others…* *…….*

- Decision-making
- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Working in an interdisciplinary environment
- Production of free, creative and inductive thinking

(3) SYLLABUS

The course syllabus includes:

i. Methods of Statistical analysis used in decision making:
   - Sampling theory
   - Statistic distributions
   - Regression analysis

ii. Decision theory under uncertainty and risk:
   - Decision trees
   - Fuzzy sets

iii. Decision making based on game theory
iv. Decision making based on queuing theory
v. Decision making based on inventory models
vi. Multiple Criteria Decision Making
vii. Scheduling/Sequencing network decision techniques i.e. GANT-CPM-PERT
viii. Simulation models
ix. Introduction to Decision Support Systems

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	• Class lectures • Case studies • Notes, slides
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	• Presentations • e-class

TEACHING METHODS

The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

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

Activity	*Semester workload*
Lectures	60
Individual assignments and exercises	40
Individual Study	50
Course total	150

STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *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* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	• Individual assignments and numerical exercises during the course (20%) • Final written exams (80%)

(5) ATTACHED BIBLIOGRAPHY

- Bibliography:

- I. K. Μουρμούρης, «Εφαρμογές Θεωρίας Αποφάσεων Πολλαπλών Κριτηρίων: Μεταφορές, Χωροθέτηση και Ανάπτυξη», ISBN 9789603516880, Εκδόσεις: Α. Σταμούλης, 2007.

- Ν. Ματσατσίνης - Κ. Ζοπουνίδης, «Συστήματα αποφάσεων με πολλαπλά κριτήρια», ISBN 9604610686, Εκδόσεις: Κλειδάριθμος, 2007.

- Selected referred journals:

International Journal of Management and Decision Making
International Journal of Decision Support Systems
Decision-Making for Supply Chain Integration
International Journal of Multicriteria Decision Making
Multiple Criteria Decision Making
Journal of Multi-Criteria Decision Analysis
Decision Support Systems
Journal of Decision Systems
Journal of Soft Computing and Decision Support Systems
Omega
Operations Research
European Journal of Operations Research
Computers and Operations Research
Mathematics of Operations Research
Annals of Operations Research
American Journal of Operations Research
Mathematical Programming
Operations Research Letters