COURSE OUTLINE

1. GENERAL

SCHOOL	ENGINEERING
DEPARTMENT	PRODUCT AND SYSTEMS DESIGN ENGINEERING
LEVEL OF STUDIES	Undergraduate
COURSE CODE	4310 **SEMESTER** 9th
COURSE TITLE	**Decision support systems**

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	**3**	**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*	Scientific area
PREREQUISITE COURSES:	NONE
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK/ENGLISH
COURSE DELIVERED TO ERASMUS STUDENTS	YES
MODULE WEB PAGE (URL)	https://eclass.uowm.gr/

2. LEARNING OUTCOMES

Learning outcomes

The aim of the course is to understand the basic concepts of decisions and to consolidate the main principles of Decision Support Systems. The categories, the basic procedures and the decision-making phases in the company are presented and cases of decisions in structured and semi-structured or unstructured problems are distinguished. Decision-making methods such as decision trees and tables, structuring and analyzing problems in conditions of certainty and uncertainty, evaluating alternative actions, multi-criteria decision analysis methodologies and group decision-making are studied. Also, the categories, architectures and methodologies of decision support systems are studied using modeling, simulation, artificial intelligence, data warehouses and data mining techniques to support decision making.

On successful completion of this module the learner will be able to:

1. Understands the importance of decision-making processes in the modern economy, and in particular in the areas of application of Product, Systems and Services Design processes
2. Knows the historical development of Decision Support Systems (DSS) in relation to business research, management and Design Theories and Methodologies
3. Understands in depth the existing models and theories used in decision making and support.
4. Uses basic decision support methods and tools
5. Has become familiar with the Multi-Criteria DSS.
6. Familiar with Team and Operational DSS.

General Skills

Upon successful completion of the program students will:

- have the theoretical and practical background on the field of product and systems design engineering and the corresponding profession.
- utilize scientific knowledge to understand, analyze and solve problems.
- apply a wide range of scientific and technical knowledge concerning the design and development of products and systems.

3. COURSE CONTENTS

- The role of Decision Analysis,
- Cognitive Functions in Decision Making,
- Value and Usefulness,
- Methods of Analysis and Decision Making,
- Decisions under Certainty and Uncertainty,
- The role of DSS in the decision-making process,
- Degree of Building and Decision Making,
- Characteristics and capabilities of DSS,
- Principles and basic concepts of Multi-Criteria Decision Support,
- Modeling of Preferences and Criteria, Preference Structures, Types of Criteria,
- Interactive Methods,
- Phases of the Decision Making Process,
- Structure of DSS,
- Group Decision Support Systems,
- Operational, Knowledge Based, Intelligent DSS,
- Design and Development of DSS.

4. TEACHING METHODS - ASSESSMENT

MODE OFDELIVERY	In class, face to face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	• Video and slide presentations via projector • Support of teaching process via the electronic platform e-class • Communication with students.

TEACHING METHODS	*Activity*	*Semester workload*
	Lectures	90
	Non-directed study	60
	Course total	**150**

ASSESSMENT METHODS	Final written exam which includes: i. Short-answer questions ii. Multiple choice questions iii. Problem solving

5. ATTACHED

- Suggested bibliography:

– Νικόλαος Ματσατσίνης, Συστήματα υποστήριξης αποφάσεων, Εκδόσεις Νέων Τεχνολογιών, 2010, ISBN 978-960-6759-44-4
– Bouyssou, D. et al. (2000), *Evaluation and Desision Models : A Critical Perspective,* Kluwer Academic Publishers, Boston

- Goodwin, P., and G. Wrigth, (1998), *Decision Analysis for Management Judgment,* Wiley.
- Holsapple, C.W., A.B. Whinston (1996), *Decision support systems: A knowledge-based approach,* West Publishing Company, Minneapolis
- Keen, P, G. W. and Michael S. Scott Morton (1978), *Decision Support Systems: An Organizational Perspective*. Reading, MA: Addison-Wesley, Inc
- Keeney R. and H. Raiffa (1976), *Decision with Multiple Objectives : Preferences and Value Tradeoffs.* John Wiley & Sons
- Klein, M. R. and L. B. Methlie (1995), *Knowledge-based Decision Support Systems with Applications in Business.* Chichester, UK: John Wiley & Sons
- Power, D. (2002), *Decision Support Systems: Concepts and Resources for Managers*, Greenwood Publishing Group
- Roy, B. (1996), *Multicriteria Methodology for Decision Aiding,* KLUWER
- Saaty, T. L. (1990), *The Analytic Hierarchy Process,* RWS Publications, Pittsburgh
- Sprague, R. H., Jr. and H. J. Watson (1996*), Decision Support for management,* Upper Saddle River*,* NJ: Prentice Hall
- Turban, E. and E. J. Aronson (2001), *Decision Support Systems and Intelligent Systems,* Prentice Hall International, Inc