

COURSE OUTLINE: MANAGEMENT SCIENCE

GENERAL

SCHOOL	ECONOMICS AND BUSINESS		
ACADEMIC UNIT	ECONOMICS		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	OE701	SEMESTER	7th (Major B)
COURSE TITLE	MANAGEMENT SCIENCE		
INSTRUCTOR	Professor I. S. KEVORK		
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
		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, specialized general knowledge, skills development</i>	SPECIAL BACKGROUND – COMPULSORY, MAJOR: BUSINESS ECONOMICS		
PREREQUISITE COURSES:	YES, MICROECONOMIC ANALYSIS II		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://econ.uth.gr/		

LEARNING OUTCOMES

Learning outcomes <i>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.</i> <i>Consult Appendix A</i> <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> <i>Guidelines for writing Learning Outcomes</i>
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By the end of this course, students will be able to:

- (a) Apply the maximum expected payoff and minimum expected regret criteria to decision-making problems under conditions of risk.
- (b) Use Bayes' theorem to estimate posterior conditional probabilities of events in problems requiring posterior decision analysis; construct revised payoff tables when additional information is acquired; and calculate the expected value of additional information.
- (c) Formulate linear and integer programming models, solve the resulting problems using Microsoft Excel Solver, and perform the required sensitivity analysis.
- (d) Determine the optimal inventory policy for Newsvendor models and for continuous-review and periodic-review inventory models.
- (e) Select the appropriate queueing model based on the characteristics of a service system; calculate the required steady-state performance measures; and estimate the direct and indirect operating costs of the system

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</i>
<i>Team work</i>	<i>sensitivity to gender issues</i>
<i>Working in an international environment</i>	<i>Criticism and self-criticism</i>
<i>Working in an interdisciplinary environment</i>	<i>Production of free, creative and inductive thinking</i>
<i>Production of new research ideas</i>	<i>.....</i>
	<i>Others...</i>
	<i>.....</i>

The course aims at the following general competencies:

- Search for, analysis and synthesis of data and information with the use of the necessary technology,
- Decision making,
- Promotion of free, creative and inductive thinking,

and the following specific objectives:

- (a) Understand the usefulness of management science techniques in decision-making problems in businesses and organizations,
- (b) Become familiar with procedures for developing and/or using appropriate models, methodologies, techniques, etc. which will help them in the systematic development and application of the analytical ability required for decision making,

(c) Understand the conditions and limitations in the use and application of each technique depending on the nature of the business problem and the decision to be taken.

SYLLABUS

1. PRIOR AND POSTERIOR ANALYSIS IN DECISION MAKING: Construction of Payoff tables, Maximin and Maximax payoff criteria, Minimax regret criterion, Payoff tables with and without additional information, Decision trees with additional information.
2. LINEAR AND INTEGER PROGRAMMING: Problem formulation, Interpreting the solution – sensitivity analysis, Linear and Integer programming applications to business problems, Solving problems using computer software.
3. QUEUING MODELS: Elements of a queuing model and its dynamic evolution, Evaluation criteria of a queuing model in steady-state conditions, Cost models, Capacity determination of a queuing system.
4. INVENTORY MODELS: Inventory systems with stochastic demand, Single period inventory models – The newsvendor problem, Continuous review inventory systems (Q,R), Periodic review inventory systems.

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>	The learning process is supported through the use of (a) the electronic platform e-class and the institutional email, (b) Microsoft EXCEL
TEACHING METHODS <i>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</i>	The lectures are delivered in the classrooms of the Department of Economics through the use of Microsoft Office 365 tools (Word, EXCEL, Power-Point). Before each lecture, slides and supporting material have already been posted on the course electronic platform "e-class", so that students can have access to them during the lecture. The existing technological equipment of the above rooms also enables the use of an electronic whiteboard through a WACOM device, which allows writing in presentations and texts with storage capabilities of rich texts and presentations. The enriched texts containing comments on the lectures and solutions to exercises and problems are also posted in the e-

	class after the end of each lecture. This uploaded material on e-class includes also files containing additional problems and exercises that students are invited to solve in order to practice and understand the taught material. Solutions and comments on these problems are given either during lectures or during office hours announced by the teacher responsible (in special cases even via e-mail using students’ institutional accounts)	
	More specifically, the workload of the module is analyzed as follows:	

	course syllabus. The written examination grade accounts for 100% of the final grade for the September examination period.
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ATTACHED BIBLIOGRAPHY

SPREADSHEET MODELING & DECISION ANALYSIS: A PRACTICAL INTRODUCTION TO BUSINESS ANALYTICS

Edition: 9th

Author: Ragsdale C.T.

Publisher: Cengage Learning

OPERATIONS RESEARCH: AN INTRODUCTION

Edition: 11th

Author: Hamdy A. Taha

Publisher: [Pearson](#)

AN INTRODUCTION TO MANAGEMENT SCIENCE: QUANTITATIVE APPROACHES TO DECISION MAKING

Edition: 16th

Authors: Camm Jeffrey D., Cochran James J., Fry Michael J., Ohlmann Jeffrey W., Anderson David R., Sweeney Dennis J., Williams Thomas A.

Publisher: Cengage Learning

Kevork, I. S. (2010). Estimating the optimal order quantity and the maximum expected profit for single period inventory decisions. *OMEGA, The International Journal of Management Science*, Vol. 38, pp. 218-227.

Halkos, G.E., Kevork, I.S., Tziourzioumis, C.N. (2018). On the existence of unique minimum for the cost function in a (Q,R) inventory model with backorders. *IMA Journal of Management Mathematics*, Vol. 29, pp. 1-21. (ISI-Web of Science, AJG, SCOPUS)

Lee, H.L., SO, K.C., Tang, C.S., (2000). The value of information sharing in a two-level supply chain. *Management Science* 46(2), 626-643

Related Academic Journals: European Journal of Operational Research, OMEGA-The International journal of Management Science, Management Science, IMA-Journal of Management Mathematics, International Journal of Forecasting, International Journal of Production Economics, Decision Sciences, Applied Economics, The Journal of Operational Research Society.