

COURSE OUTLINE

(1) GENERAL

SCHOOL	FACULTY OF ECONOMICS AND POLITICAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	UNDERGRADUATE PROGRAM OF STUDIES IN ECONOMICS		
COURSE CODE	QNT401	SEMESTER	8th
COURSE TITLE	APPLIED OPERATIONAL RESEARCH		
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		4	7
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Qualified Skills development		
PREREQUISITE COURSES:	No		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://eclass.uoa.gr/courses/ECON907/		

(2) LEARNING OUTCOMES

<p>Learning outcomes</p> <p><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></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <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>
<p>The purpose of the course is to familiarize students with various scientific methods and analysis techniques from the field of Management Science/Operational Research, which can be used in the solution and decision-making process of complex business problems. It is a continuation of the course Mathematical Programming Techniques (QNT303), and covers project management, planning and inventory control of a business (identifying standards) and the introduction to the development and application of simulation models.</p> <p>Upon successful completion of the course, students will be able:</p> <ul style="list-style-type: none"> • To understand, after acquiring substantial knowledge of this subject, the problems of administration as problems of optimization. • Understand definitions and key concepts related to the field of Management Science/Operations Research. • To model with the appropriate mathematical or non-mathematical formulation various problems related to administrative and operational research. • To plan, monitor and control in an optimal way the implementation of a project. • To calculate the cost, duration and resources required for the implementation of a project. • To understand the concepts of modern methods of managing a business's inventory. • To analyze problems related to inventory management. • To understand the theoretical and conceptual framework of the simulation.

<ul style="list-style-type: none"> • To generate, in the context of the simulation, values of a random variable and synthesize various distributions. • To apply the Monte Carlo simulation process. • To recognize in practice those problems that can be addressed with Simulation methods. 																		
<p>General Competences</p> <p><i>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></p> <table border="0"> <tr> <td><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></td> <td><i>Project planning and management</i></td> </tr> <tr> <td><i>Adapting to new situations</i></td> <td><i>Respect for difference and multiculturalism</i></td> </tr> <tr> <td><i>Decision-making</i></td> <td><i>Respect for the natural environment</i></td> </tr> <tr> <td><i>Working independently</i></td> <td><i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i></td> </tr> <tr> <td><i>Team work</i></td> <td><i>Criticism and self-criticism</i></td> </tr> <tr> <td><i>Working in an international environment</i></td> <td><i>Production of free, creative and inductive thinking</i></td> </tr> <tr> <td><i>Working in an interdisciplinary environment</i></td> <td><i>.....</i></td> </tr> <tr> <td><i>Production of new research ideas</i></td> <td><i>Others...</i></td> </tr> <tr> <td></td> <td><i>.....</i></td> </tr> </table>	<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>.....</i>	<i>Production of new research ideas</i>	<i>Others...</i>		<i>.....</i>
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<p>The general skills that the student should have acquired and which the course aims at are:</p> <ul style="list-style-type: none"> • Search, analyze and synthesize data and information, using the necessary technologies. • Adapting to new situations • Decision-making • Teamwork • Working in an interdisciplinary environment • Project planning and management • Scientific thinking and notation 																		

(3) SYLLABUS

<p>Content:</p> <p><u>I. – Project Management – Time Planning</u></p> <p>1. Configuration and solution of network models. 2. PERT technique – Time uncertainty. 3. C.P.M. Technique - Labor Cost. 4. Allocation of resources</p> <p><u>II. Introduction to Simulation</u></p> <p>1. Objectives of the simulation. 2. Random numbers. 3. Creation of random variable values (with the known probability function, from an empirical distribution). 4. Simulation process - Composition of distributions</p> <p><u>III. Introduction to Planning and Inventory Control</u></p> <p>1. Introduction to stock theory. 2. Characteristics of stock standards. 3. Costs in planning and inventory control. 4. Inventory management standards (Economic Order Quantity (EOQ) in the basic form, EOQ when shortages are allowed, EOQ when demand is met by production, EOQ with discounts on the entire quantity). 4. Multi-product inventory systems.</p>

(4) TEACHING and LEARNING METHODS - EVALUATION

<p>DELIVERY</p> <p><i>Face-to-face, Distance learning, etc.</i></p>	<p>Face-to-face</p>
<p>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</p> <p><i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<p>Teaching:</p> <ul style="list-style-type: none"> -Lectures in the classroom, using a projector for PowerPoint-style presentations in teaching. -Lectures in the computer lab in which appropriate software is used to solve problems in the context of the course. <p>Communication with students:</p> <ul style="list-style-type: none"> -Face-to-face during office hours. -Use of an electronic e-class platform for posting learning material and announcements. -Use of e-mail to communicate with students.

	All students enrolled in the course have access to the course materials available on the university's e-class platform.										
<p>TEACHING METHODS</p> <p><i>The manner and methods of teaching are described in detail.</i></p> <p><i>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.</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>	<table border="1"> <thead> <tr> <th>Activity</th> <th>Semester workload</th> </tr> </thead> <tbody> <tr> <td>Lectures in a classroom and computer lab</td> <td>52</td> </tr> <tr> <td>Study of notes and bibliography</td> <td>60</td> </tr> <tr> <td>Solving exercises at home</td> <td>63</td> </tr> <tr> <td>Course total</td> <td>175 hours</td> </tr> </tbody> </table>	Activity	Semester workload	Lectures in a classroom and computer lab	52	Study of notes and bibliography	60	Solving exercises at home	63	Course total	175 hours
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<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>Review language: Greek</p> <p>Assessment Methods: The final grade of the course is 100% determined by the written examinations in the examination period of the spring semester. The written exam involves solving problems and exercises. The examination is conducted with closed books. However, the use of a typology of a sheet created by the students themselves is allowed. The syllabus, the procedures and the criteria of the evaluation are communicated to the students during the lectures and by posting relevant announcements and material on the electronic platform e-class. Students have the opportunity to see their examination script after the grading of the course (during the office hours of the course supervisor) and to receive explanations about the grade they received.</p>										

(5) ATTACHED BIBLIOGRAPHY

<p><i>- Suggested bibliography:</i></p> <ul style="list-style-type: none"> ● G. Economou, A. Georgiou. Operational Research for Administrative Decision-Making, Second Edition, E. Benou Publications, Athens, 2016. ● G. Prastakou, Administrative Science-Business Decision Making in the Information Society, Stamoulis Publications, 2006. ● P. Ypsilantis, Operational Research. Decision-making methods and techniques, 5th edition, Propompos Publications, Athens, 2015 ● Anderson, D.R., Sweeney, D.J., Williams, T.A., Martin, K., Management Science. Quantitative Methods for Business Decision Making, Kritiki Publications, 2014. ● Taha, H.A., Introduction to Operational Research, TZIOLA Publications, 10th edition, 2018 ● Hillier, F.S., Lieberman, G.J., Introduction to Operational Research, TZIOLA Publications, 10th edition, 2018 ● Instructor's Notes
