**COURSE LAYOUT**

1. **GENERAL**

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| **SCHOOL** | Applied Economics and Social Sciences |
| **DEPARTMENT** | AGRICULTURAL ECONOMICS AND RURAL DEVELOPMENT |
| **STUDY LEVEL** | *Undergraduate* |
| **COURSE CODE** | 3705  | **SEMESTER** | 9th  |
| **COURSE TITLE** | Operations research  |
| **INDEPENDENT TEACHING ACTIVITIES** | **WEEKLY TEACHING HOURS** | **CREDITS/ECTS** |
| LECTURES and PRACTICAL EXERCISES | 5 | 5 |
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| **COURSE TYPE** | Scientific area  |
| **PREREQUISITES** |  |
| **LANGUAGE** | Greek with English support in terminology |
| **IS THE COURSE OFFERED forERASMUS STUDENTS?** | NO (in English) |
| **COURSE WEB PAGE** | <https://mediasrv.aua.gr/eclass/modules/document/?course=AOA228> |

1. **LEARNING OUTCOMES**

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| **Learning Outcomes** |
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| This course initiates students to the elementary concepts and methodologies of Operations Research and applications to the agriculture and animal husbandry as well as to the agro-industry. The objective is to enhance the ability of decision making under uncertainty and of the risk management analysis With the completion of the course students are expected to know the basic techniques and mathematical models so that they support diligent and rational decisions and also to manage efficiently a large spectrum of managerial problems. They are also expected to investigate and quantitatively assess and estimate micro-economic models for decision making and understand the relationship of positive economic analysis with the normative rules for the firm to follow. |
| **General Competenses** |
| * Search, analysis and synthesis of data and information with the use of necessary technologies
* Adaptation to new conditions
* Decision making
* Production of innovative research ideas
* Planning and Managing projects
* Advance of free, creative and rational thinking
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1. **COURSE CONTENT**

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| 1. Introduction to OR and Decision Theory2. MATHEMATICAL PROGRAMMING * Basic concepts. Graphical and algebraic solution process
* Problem building for agriculture
* Problem building for energy and the environment
* Network and transport problems
* Project management

3. MULTICRITERIA ANALYSIS* Decision making process in a multiple criterion context
* Goal and multicriteria programming
* Discrete problems – Analytical Hierarchy Process
* Outranking methods– ELECTRE and PROMETHEE

4. DECISION MAKING UNDER UNCERTAINTY * concepts and decision structure
* Payoff matrix, decision trees
* Subjective probability distributions
* Expected value criterion
* Bayes theorem and the value of information
* Utility and the axiom of rational choice
* Utility functions
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1. **TEACHING and LEARNING METHODS - Evaluation**

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| **TEACHING METHOD** | In suitably equipped teaching rooms |
| **USE OF INFORMATICS and COMMUNICATION TECHNOLOGIES** | The course is completely computer-supported using e-board and computer lab infrastructure (Powerpoint, spreadsheet use, etc.)Relevant applications are taught and distributed to students, for the analysis of financial information. |
| **TEACHING ORGANISATION** |

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| *Activity* | *Work Load* |
| Lectures (direct) and practical excersises | 65 h  |
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| Autonomous study | 60 h |
| *Total contact hours and training* | ***125 h******(5 ECTS)*** |

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| **STUDENTS EVALUATION** | Written final examination to evaluate the assimilation of the lecture material, containing:- Questions of theoretical knowledge.- Quantitative problems.  |

1. **BIBILIOGRAPHY**

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| 1. Γ. Πραστάκος, Διοικητική Επιστήμη (Decision science), Λήψη Επιχειρησιακών Αποφάσεων στην Κοινωνία της Πληροφορίας, εκδ. Σταμούλης, 2003
2. Γ. Οικονόμου, Α. Γεωργίου, (Quantitative analysis for managerial decisions) Ποσοτική Ανάλυση για τη Λήψη Διοικητικών Αποφάσεων, Τόμοι Α, Β, Εκδ. Ε. Μπένου, 2006
3. Π. Υψηλάντης, Επιχειρησιακή Ερευνα (Operations research), εκδ. Προπομπός, 2008

*-Relevant journals:* *Journal of Operations Research Society, European Journal of Operational Research, Operations Research: An International Journal, International Journal of Multicriteria Decision Making*  |