

| a) General | | | |
|---|---|-----------------|-------------|
| <i>School</i> | ENGINEERING | | |
| <i>Academic unit</i> | MECHANICAL ENGINEERING | | |
| <i>Level of studies</i> | Undergraduate | | |
| <i>Course code</i> | MM006Y02 | <i>Semester</i> | 3 |
| <i>Course title</i> | Operations research | | |
| <i>Independent teaching activities</i> | <i>Weekly teaching hours</i> | | <i>ECTS</i> |
| Lectures | 3 | | 4.0 |
| Laboratory exercises | | | |
| <i>Course type</i> | Special background | | |
| <i>Course category</i> | Compulsory | | |
| <i>Prerequisite courses</i> | - | | |
| <i>Language of instruction and examinations</i> | Greek /English | | |
| <i>Is the course offered to Erasmus students</i> | Yes | | |
| <i>Course website (url)</i> | https://ops.mech.uniwa.gr/ | | |
| b) Learning outcomes and general competences | | | |
| b1. Learning outcomes | | | |
| <p>Upon successful completion of this course, the student will be able to:</p> <ul style="list-style-type: none"> - Familiarise with operational research (OR) methods and tools - Understand the characteristics of different types of decision-making environments and select the appropriate OR methods and tools to be used in each type - Design new simple mathematical models - Build and solve linear and integer programming problems via the use of appropriate software (i.e. EXCEL, LINDO) | | | |
| b2. General competences | | | |
| <ul style="list-style-type: none"> - 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 interdisciplinary environment - Production of new research ideas - Production of free, creative and inductive thinking | | | |
| c) Syllabus | | | |
| <p>The aim of the course is to provide the state of the art of operational research (OR) methods and tools in the optimal design and implementation of a wide range of synchronous problems. The usefulness of OR applies on the modelling of many managerial and/or technological decisions requiring an optimal decision (max or min). For this purpose, the fundamental decision-making tools (LP, MILP, IP) are analysed, employed and solved with appropriate software applications (i.e. office EXCEL SOLVER, LINDO etc). Specific operations in business research i.e. network analysis, shortest route problem, maximum flow, minimum cost flow, minimum cover tree, transportation problems, transshipment and allocation problems are also in detail studied. Various case studies and applications conclude the course curriculum.</p> | | | |
| d) Teaching and learning methods - Evaluation | | | |

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| Delivery | Face-to-face, Distance learning | |
| Use of information and communications technology | <ul style="list-style-type: none"> - Commercial/free/open source software - MS Teams/Moodle | |
| Teaching methods | <i>Activity</i> | <i>Semester workload</i> |
| | Lectures | 26 |
| | Tutorials | |
| | Laboratory exercises | 13 |
| | Computational exercises | 13 |
| | Individual work | 13 |
| | Course total | 104 |
| Student performance evaluation | Written examinations, assignments (based also on software applications) | |
| e) Suggested bibliography | | |
| <ol style="list-style-type: none"> 1. Hillier S. Frederick and Lieberman J. Gerald, 2000, "INTRODUCTION TO OPERATIONS RESEARCH", ISBN: 0071267670, Ed. McGraw-Hill Education, Europe 2. Taha A. Hamdy, 2011, "INTRODUCTION TO OPERATIONS RESEARCH [Εισαγωγή στην ΕΠΙΧΕΙΡΗΣΙΑΚΗ ΕΡΕΥΝΑ]", 9th Edition/ 9^η Έκδοση, ISBN: 978960418327, Ed. Tziola, Greece 3. Kostoglou Vasileios, 2002, "OPERATIONS RESEARCH [ΕΠΙΧΕΙΡΗΣΙΑΚΗ ΕΡΕΥΝΑ]" ISBN: 9608050847, Ed. Tziola, Greece 4. Fragkos Christos, 2006, "INTRODUCTION TO OPERATIONS RESEARCH [ΕΙΣΑΓΩΓΗ ΣΤΗΝ ΕΠΙΧΕΙΡΗΣΙΑΚΗ ΕΡΕΥΝΑ]", ISBN: 9789603516552, Ed. Stamoulis, Greece | | |