COURSE OUTLINE

(1) GENERAL

SCHOOL	BUSINESS		
ACADEMIC UNIT	DEPARTMENT OF BUSINESS ADMINASTRATION		
LEVEL OF STUDIES	POSTGRADUATE		
COURSE CODE	**ΔΙΕΠ5**	**SEMESTER**	**3ο**
COURSE TITLE	**OPERATIONS RESEARCH**		
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**
Tutorials		3	5
Lab-Exercise		1	
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*	Empowering knowledge		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

Learning outcomes

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.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Operations research (OR) has many applications in science, engineering, economics, and industry Being able to solve the real life problems and obtaining the right solution requires understanding and the problem. Operations research provides tools and techniques to solve real problems, and find the optimal solution subject to constraints of time, resources, material, and business rules. This is an introductory course in operations research (OR). The main emphasis is the Linear Programming

After completing this course, students should demonstrate competency in the following skills:

- Understand the background of Operations Research and its role in your business
- Understand the link between resources and requirements
- Receive further insight into operational process and using optimization techniques

- Calculate alternative solutions by changing inputs
- Link the results of an optimal solution to business benefit
- Learn to use OR software (Solver application)

All above are aligned to Level 7 of European Qualification Framework

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?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Decision-making
- Project planning and management
- Team work
- Working in an interdisciplinary environment
- Project planning and management
- Production of free, creative and inductive thinking

(3) SYLLABUS

- Introduction to Operations Research
- Mathematical Formulation
  - Elements & Properties of an LP model
  - Mathematical Formulation of a Linear Programming (LP) Problem
- Solving Linear Programming problems with Graphical Method
  - Graphical Solution
  - Special Cases in Graphical Solution
  - Sensitivity Analysis in Graphical Solution
- Solving Linear Programming problems with Simplex Method
  - Types of a Linear Programming Model
    - Normal & Typical Type
  - The Simplex Method
  - Sensitivity Analysis with Simplex Method
    - Sensitivity Analysis to Right Hand Side Constraints
    - Sensitivity Analysis to Objective Coefficients
- Dual Problem
  - Definition of Dual Problem
  - Simplex Algorithm in Duality
  - Sensitivity Analyisis
- Transportation Problem
  - Vogel Method

- Northwest Corner Method
- MODI Method

- Assignment Problem
  - Huggarian Method

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>• Face to face lectures
• Online lectures via zoom</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>• Use of ICT in teaching (PPT presentations)
• Communication with students via e-mail and moodle platform
• Uploading course material on moodle platform.</td></tr>
<tr><td>TEACHING METHODS
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</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>30</td></tr>
<tr><td>Practice Exercises</td><td>70</td></tr>
<tr><td>Written Essays</td><td>100</td></tr>
<tr><td>Independent study</td><td>50</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>250</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

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

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>• Evaluation of students takes place via written exams.
• In special cases, for students with disabilities, evaluation takes place via oral exams
• Multiple choice questions and questions of problem solving are used for evaluating learning outcomes
• Language of evaluation: Greek</td></tr>
</table>

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Anderson D.R., D.J. Sweeny and T.A. Williams, Quantitative Methods for Business, 6th edition, West Publishing Company, 1995.
2. Dantzig G.B. and M. Thapa, Linear Programming 1, Introduction, Spinger – Verlag, New York, 1997.
3. Georgiou A.K., Oikonomou, Tsiotras, G.D, Case Studies Operations Research, Benou Publications, 2006.
4. Hillier F.S. and G.J. Lieberman, Introduction to Operations Research, 6th edition, International Editions, McGraw-Hill, 1995.
5. Kounias, S., Fakinos, D., Linear Programming, Ziti Publications, 1989.
6. Oikonomou, G., Georgiou, A., 2008. Quantitative methods for Decision Making" Benou Publications
7. Prastakos, G., Managemnet Science, Decision Making in Information Society, Stamoulis Publications, 2000

8. Hamdy Taha (2011/9η Εκδοση). Operations Research, Tziola's Publications
9. Tsantas, N.D., Vassileiou, P., Introduction to Operations Research, Ziti Publications, 2000
10. Ypsilantis, P., Operations Research: Application in industry, Propobos Publications, 2006.
11. Fragkos, C., Introduction in Operations Research: Decision Making, Stamoulis Publications, 2006.
12. Winston L.W. Operations Research, Applications and Algorithms, 3rd ed., Duxbury Press, 1994