Operations Research I

Code: 102391 Credits ECTS: 6

Degree	Academic degree	Туре	Year	Semester
2501572 Bachelor in Business Administration	950 Degree in Business Administration	CS	3	1

Use of languages

Coordinator

Name: Dr. David Pujolar Morales	Main language: Spanish (spa)
E-mail: David.Pujolar@uab.cat	Some group entirely in English: No
	Some group entirely in Catalan: No
	Some group entirely in Spanish: No

Prerequisites

Those established by the current public regulations for university degree studies.

Objectives

This course is an introduction to Operations Research for students in Business Administration. The course provides basic tools for modeling and to make scientifically based economic decisions. Throughout this course, students are expected to know how to formulate problems as quantitative models that can be solved using algorithmic procedures. Also, students will be able to understand and interpret the results of these procedures.

Competences

- Apply theoretical knowledge to improve relations with customers and suppliers, and identify advantages and disadvantages of the relations on both sides: firms and customers/suppliers.
- Apply mathematical tools to synthesize complex systems.
- Ability to continue learning independently in the future, deepening the knowledge acquired or started in new areas of knowledge.
- Identify, justify and reason the right decisions based on the parameters of a business problem.
- Ability to make decisions under uncertainty and show entrepreneurial and innovative spirit.
- Select and generate the necessary information for each problem, analyze it and make decisions based on this information.

Learning outcomes

- 1. Apply the basic principles of modeling in making business decisions.
- 2. Apply algorithmic problem solving techniques in optimization problems.
- 3. Ability to continue learning independently in the future, deepening the knowledge acquired or started in new areas of knowledge.
- 4. Discern between alternative methods of analysis, and apply appropriate quantitative tools to solve business-administration problems
- 5. Ability to make decisions under uncertainty and show an entrepreneurial and innovative spirit.
- 6. Ability to solve optimization problems and obtain forecasts using mathematical software.
- 7. Select and generate the necessary information for each problem, analyze it and make decisions based on this information.
- 8. Use forecasting techniques in business.

2013/2014

Operations Research I 2013 - 2014

Covered topics

PART I: Introduction to Linear Programming

PART II: Introduction to Graph Theory and Network Flows

PART III: Computer tools for Operations Research

Methodology

1. Theoretical lectures.

2. Practice classes: modeling and solving problems and learn algorithmic techniques using specialized software.

3. Individual study based on the material developed in the lectures and in the complementary references.

Learning activities

Title	Hours	ECTS	Learning Outcomes	
Type: guided				
Practice classes	15	0,6	1, 2, 3, 4, 5, 6, 7, 8	
Lectures	30	1,2	1, 2, 3, 4, 6, 7	
Type: Supervised				
Office hours	5	0,2	1, 2, 3, 4, 5, 6, 7	
Type: Autonomous				
Individual study	95	3,8	1, 2, 3, 4, 5, 6, 7, 8	

Evaluation¹

- 1. Final exam: 90% of the final course grade.
- 2. Participation and problem solving in practice classes: 10% of the final course grade.

Re-evaluation and "not presented"²:

Those students who achieved a final grade between 4 and 5 have the right to a re-evaluation. The teachers will decide the format of the re-evaluation. The date of the re-evaluation will be scheduled in the examination calendar of the Faculty. The grade of the re-evaluation will be qualitative, with only two options: "apt" or "not apt". If the student gets the grade from "apt" then the student passes the course with a grade equal to 5. If the student receives a "not apt" qualification, then the course is not approved and the final grade will be equal to the grade obtained before the re-evaluation.

¹ It should be noted the following agreement of the Board of Teaching and Research in the plenary session on May 2, 2012 *"It can not be imposed the same evaluation criteria to the teaching staff of a same subject who have full research and teaching capacity. It must be preserved the academic freedom of teachers and the choice of methodology of assessment is one element of their academic freedom"*

² According to the Dean's Team agreement of June 22, 2010.

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A student can only get a "not presented" as long as he/she was not involved in any evaluation activity. Therefore, a student who participates in any component of the "continuous evaluation" he/she will not be eligible to get a "not presented".

Assessment activities

Title	Weight	Hours	ECTS	Learning Outcomes
Participation and problem solving in practice classes	10	1	0,04	1, 2, 3, 4, 5, 6, 7, 8
Final exam	90	4	0,16	1, 2, 3, 4, 6, 7

Bibliography:³

Ahuja, R.; Magnanti, T. and Orlin, J. (1993): <u>Network Flows: Theory, Algorithms, and Applications</u>, Prentice-Hall.

Hillier, F. and Lieberman, G. (2012): Introduction to Operations Research, 9th ed. McGraw-Hill.

Winston, W. (2003): Operations Research: Applications and Algorithms 4th ed., Duxbury Press

³ Lecturers can recommend different bibliography in their own groups, in exercise of their academic freedom. The changes will be communicated to students in the first lecture.