Operations Research I	2014/2015

Code: 102391
ECTS Credits: 6

Degree	Type	Year	Semester
2501572 Administració i Direcció d'Empreses	OB	3	1

Contact

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Use of languages

Principal working language: espanyol (spa)

Some groups entirely in English: No

Some groups entirely in Catalan: No

Some groups entirely in Spanish: No

Prerequisites

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

Objectives and Contextualisation

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.

Skills

- Apply mathematical instruments to synthesise complex economic-business situations.
- Apply theoretical knowledge to improve relations with clients and suppliers, identifying the advantages and disadvantages of those relations for both sides: company and client or supplier.
- Capacity for independent learning in the future, gaining more profound knowledge of previous areas or learning new topics.
- Identify, justify and reason the appropriate decisions according to the basic parameters of a business problem.
- Select and generate the information necessary for each problem, analyse it and take decisions based on that information.
- Take decisions in situations of uncertainty, demonstrating an entrepreneurial and innovative attitude.

Learning outcomes

1. Apply algorithmic resolution techniques to optimisation problems.
2. Apply the basic principles of modelling in business decision-making.
3. Capacity to continue future learning independently, acquiring further knowledge and exploring new areas of knowledge.
4. Differentiate between alternative methods of analysis, and apply the appropriate quantitative tools to resolve business management problems.
5. Make decisions in situations of uncertainty and show an enterprising and innovative spirit.

6. Select and generate the information needed for each problem, analyse it and make decisions based on this information.
7. Solve problems optimising and obtaining forecasts through information technology applications.
8. Use forecasting techniques in business contexts.

Content

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.

Activities

Title	Hours	ECTS	Learning outcomes
Type: Directed			
Lectures	30	1.2	2, 1, 3, 4, 7, 6
Practice classes	15	0.6	2, 1, 3, 4, 5, 7, 6, 8
Type: Supervised			
Supervised	5	0.2	2, 1, 3, 4, 5, 7, 6
Type: Autonomous			
Autonomous	95	3.8	2, 1, 3, 4, 5, 7, 6, 8

Evaluation

Evaluation [1]

1. Final exam: 90% of the final course grade.

2. Participation and problem solving in practice classes: 10% of the final course grade.

[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"*

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 andthe final grade will be equal to the grade obtained before the re-evaluation.

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

Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Final exam	90	1	0.04	2, 1, 3, 4, 5, 7, 6, 8
Participation and problem solving in practice classes	10	4	0.16	2, 1, 3, 4, 7, 6

Bibliography

Bibliography [3]

Ahuja, R.; Magnanti, T. and Orlin, J. (1993): Network Flows: Theory, Algorithms, and Applications, 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.