UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Operational Research

Academic Year 2024/2025

1. Organic Unit

Faculty of Business and Economic Sciences

2. Course

Business Management

3. Cycle

1st

4. Course Unit

Operational Research (24118)

5. Scientific Area

6. Curricular Year

2nd

7. Type of Curricular Unit / Semester

2nd Semester

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8. Class type and workload (work time)

Theoretical classes:	
Practical classes:	
Theoretical-Practical Classes	30,00
Tutorial Guidance:	20,00

9. ECTS Credits

6,00

10. Scientific Area Coordinator

11. Regent

Dr. JOSÉ MANUEL SILVA GUERREIRO LOUÇÃO DE MATOS

12. Assistants

13. Teaching Language

Portuguese

14. General Objectives

Develop the students' appetite for the methodology of problem formulation in the area of Management. To provide a set of specific techniques, of a quantitative nature, that allow to sustain the decisions.

15. Specific Objectives

Characterize objectives, controlled and uncontrolled variables and constraints in structured and semi-structured problems. Teach a set of techniques in the areas of linear programming, decision theory, networks and simulation that allow, by convenient handling, to draw solutions to the problems formulated.

16. Skills to be acquired

Ability to use in an adjusted way the methodology of approach to structured, semi-structured and unstructured problems in the area of Management. Ability to properly use a set of numerical techniques to support the resolution of complex problems in the area of Management.

17. Teaching Methodology

The teaching will have an eminently practical feature and will be amply illustrated through examples. The tutorial sessions will be used to support small academic papers and the development of small case studies.

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18. Course Unit Program

1. Introduction to Operational Research
2. Methodology in Operational Research
2.1. Linear Programming:
Formulation.
Resolution through the graphical method.
SIMPLEX
Simplex DUAL
Simplex Revised
Two-stage method
Big M Method
Sensitivity analysis.
Method of transport.
Allocation
2.2 Heuristics
Local search
Exhaustive research
Neighbourhood structures
Constructive heuristics
2.3. Networks:
Introduction.
Construction of a network calculation of time and time off.
Critical Path Method.
Método de PERT.
2.4. Decision Theory:
Structure and formulation of a decision problem.
Notion of utility.
Criteria in situations of uncertainty and risk.
Expected value of perfect information.
Decision trees.
Bayes' theorem (situations of "a priori", "posteriori" and "préposteriori").
2.5 Simulation Models

19. Assessment Methods

To be established in accordance with the general evaluation regulation. However, it should be noted that there will be elements of appreciation: small academic works, development of case studies, research and fieldwork of reduced scope, two tests carried out in the middle of the semester and at the end.

20. Didactic Resources

Bibliography indicated. Existing databases in the Mediatheque. SOLVER software.

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21. Sustainability Objectives

The UC aims to contribute to sustainability in the following areas:
- Ensure equal access to quality technical, professional and cultural education.
- Substantially increase the number of young people and adults with relevant qualifications, including technical and professional skills, for employment, decent work and entrepreneurship.
- Ensure equal opportunities in university education, including for people in situations of vulnerability.

22. Keywords

Model
Formulation
Linear Programming
Networks
Decision Theory

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23. Main Bibliography

Author(s):	Tavares, L. V; Themido, I. H.; Oliveira, R. C.; Correia, F. N.		
Title:	Investigação Operacional		
Edition:	1ª Edição	Year:	1996
Local:	Alfragide		
Publisher:	McGraw Hill		

Author(s):	Hillier, S. H.; Lieberman, G. J.		
Title:	Introduction to Operations Research		
Edition:	11ª Edição	Year:	2020
Local:	Singapore		
Publisher:	McGraw Hill		

Author(s):			
Title:			
Edition:		Year:	
Local:			
Publisher:			

24. Complementary Bibliography

Author(s):	Ravindran, A. R.		
Title:	Operations Research and Management Science Handbook		
Edition:	1ª Edição	Year:	2007
Local:			
Publisher:	CRC - Taylor & Francis Group		

Author(s):	Bonini, C. P.; Hausman, W. H.; Bierman, H.		
Title:	Quantitative Analysis for Management		
Edition:	9ª Edição	Year:	1997
Local:	USA		
Publisher:	Irwin/McGraw Hill		

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Ficha técnica MIP / MIP Datasheet	
Título / Title	Course Unit Program 'INVESTIGAÇÃO OPERACIONAL': Academic Year 2024/2025
Autor / Author	Dr. JOSÉ MANUEL SILVA GUERREIRO LOUÇÃO DE MATOS
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