



UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Operational Research

Academic Year 2025/2026

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

Prof. Doutora SÍLVIA ALEXANDRA CARRAPATO CHÁ

12. Assistants

13. Teaching Language

Portuguese

14. General Objectives

The main objective of this Curricular Unit is to provide students with skills to solve optimization problems and predict future behavior in the field of Management.

15. Specific Objectives

Formulate and solve problems, using Linear Programming techniques; analyze and optimize costs in order to manage resources; extract information from Forecasting Models.

16. Skills to be acquired

Solve concrete problems that help the decision-making process; identify and approach decision problems in a skillful and structured way; build models of decision problems; use quantitative methods to obtain solutions to constructed problems, as support for informed decisions; use the information extracted from the models to induce and motivate organizational changes; use the information extracted from models to predict future behavior.

17. Teaching Methodology

The Curricular Unit is structured into theoretical/practical sessions, supported by a weekly tutorial session.

In theoretical/practical sessions, there will be an exposition of the subject, included in the Curricular Unit's program, with emphasis on examples.

In tutorial sessions, exercises provided to students will be solved, within the scope of the topics taught in theoretical/practical sessions with supervision from the teacher.



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18. Course Unit Program

1.Linear Programming

The Linear Programming Model.

Linear Programming Applications.

Problems formalization.

Graphic method of Linear Programming problems.

Primal Simplex Algorithm.

Duality.

Dual Simplex Algorithm.

Economic interpretation of Primal and Dual solutions.

Post-optimization.

Sensitivity analysis.

Particular cases of Linear Programming: Transportation and Assignment Problems and resolution algorithms.

2.Project Management: CPM/PERT

Fundamental concepts. CPM (Critical Path Method). PERT (Project Evaluation and Review Technique).

Duration of activities estimation.

Critical path determination.

Cost analysis.

Optimal project duration.

3.Forecasting Models

Forecasting model choice.

Qualitative and quantitative forecasting methods.

Analysis and Classical Decomposition of Chronological Sequences.

Forecasting with Straightening Models.

Forecasting with Regression Models.

Forecasts error measures.

Forecast intervals.

19. Assessment Methods

The assessment is based on two written midterm tests.

20. Didactic Resources

Bibliography indicated. Theoretical/practical sessions notes. Software Solver.

21. Sustainability Objectives



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SDG 9: Industry, Innovation and Infrastructure. Linear Programming allows you to optimize industrial processes, promoting innovation and efficiency.

SDG 12: Sustainable Production and Consumption. Linear Programming helps to minimize waste and manage resources.

SDG 8: Decent Work and Economic Growth. CPM/PERT Project Management improves project execution, increasing productivity.

SDG 3: Quality Health. Forecast Models support outbreak forecasting and resource planning.

22. Keywords

Model

Formulation

Linear Programming

Project Management

Forecasting Models



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23. Main Bibliography

Author(s): F. S. Hillier & G. J. Lieberman
Title: Introduction to Operations Research
Edition: 9th ed. Year: 2005
Local: New York
Publisher: McGraw-Hill
ISBN Code:

Author(s): M. C. Mourão, M. V. Pato, L. S. Pinto, O. A. Simões & J. Valente
Title: Investigação Operacional-Exercícios e Aplicações
Edition: 2ª Ed. Year: 2019
Local: Lisboa
Publisher: Escolar Editora
ISBN Code:

Author(s): J. Caiado
Title: Métodos de Previsão em Gestão
Edition: 3rd ed. Year: 2022
Local: Lisboa
Publisher: Edições Sílabo
ISBN Code:

24. Complementary Bibliography

Author(s): M. M. Hill & M. M. Santos
Title: Investigação Operacional-Programação Linear, Vol.1
Edition: 4ª Ed. Year: 1999
Local: Lisboa
Publisher: Edições Sílabo
ISBN Code:

Author(s): M. S. Bazaraa, J. J. Jarvis & H. D. Sherali
Title: Linear Programming and Network Flows
Edition: 4th ed. Year: 2010
Local: Hoboken, New Jersey
Publisher: John Wiley & Sons, Inc.
ISBN Code:



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Ficha técnica MIP / MIP Datasheet	
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