UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Statics

Academic Year 2026/2027

1. Organic Unit

Faculty of Architecture and Arts

2. Course

Architecture

3. Cycle

1st

4. Course Unit

Statics (01324)

5. Scientific Area

6. Curricular Year

3rd

7. Type of Curricular Unit / Semester

1st Semester

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8. Class type and workload (work time)

Theoretical classes:	
Practical classes:	
Theoretical-Practical Classes	60,00
Tutorial Guidance:	

9. ECTS Credits

3,50

10. Scientific Area Coordinator

Prof. Doutor ANTÓNIO JOSÉ DÂMASO SANTOS MATOS VILHENA

11. Regent

12. Assistants

Prof. Doutora ANA ISABEL MERA MARQUES

13. Teaching Language

Portuguese

14. General Objectives

Provide students the ability to understand the importance of the general concepts of statics and equilibrium as they relate to architectural design.
Provide students with the basic concepts of equilibrium and the transmission of forces between structural elements.

15. Specific Objectives

To develop the student's ability to analise the external and internal equilibrium of structures.
Motivate the student to analise the load-bearing structure as an integral element of an architectural project.

16. Skills to be acquired

Ability to determine the degree of connections in a structure.
Ability to calculate support reactions in isostatic structures.
Ability to calculate force diagrams in isostatic lattice structures.
Ability to calculate forces in isostatic triangulated structures.

17. Teaching Methodology

The classes given throughout the year consist of Theoretical Classes and Practical Classes, which constitute the theoretical and practical path.
It is also intended a full involvement of the student with the discipline, in a proactive attitude, which will be obtained by the need for research and investigation during the semester.

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18. Course Unit Program

Chapter 1 - Introduction
- Fundamental Objectives of the Course;
- Assessment Methods;
- Proposed Bibliography.

Chapter 2 - Abstract Statics
- Forces in Plane and Space;
- Resultant of several concurrent forces;
- Cartesian components of a force;
- Torques and moments.

Chapter 3 - Calculating Support Reactions using the General Statics Method
- Equilibrium and free body diagram;
- Introductory notions on the various types of structures;
- Concentrated loads and uniformly distributed loads;
- Straight beams, inclined beams and frames.

Chapter 4 - Stresses in Isostatic Reticulated Structures
- Concept of Axial Force, Transverse Force and Bending Moment;
- Stress diagrams.

Chapter 5 - Calculation of Stresses in Triangulated Structures
- Types of Articulated Structures (Trusses);
- Calculation of Stresses in Trusses;
- Node method;
- Section method.

Chapter 6 - External Links and Degrees of Freedom
- Definition of links, supports and connections;
- Degrees of freedom of a structure;
- Classification of a body's links;
- Stable and unstable equilibrium;
- Isostatic, hypostatic and hyperstatic structures.

19. Assessment Methods

It seeks to motivate the presence and participation of students in class, as well as the critical spirit, factors that will contribute to the final evaluation of each student.
The attendance of students in classes will be controlled in order to enforce the Evaluation Regulation in force at Lusíada University.
Two tests will be carried out that will contribute to the continuous evaluation, within the provisions of the Evaluation Regulation in force at Universidade Lusíada.
A final written exam

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20. Didactic Resources

Various audiovisual media are used, such as multimedia presentations and film screenings.
Where possible, real-life cases will be presented for analysis and discussion.

21. Sustainability Objectives

General
1 - Ensure equal access to quality technical, vocational, and cultural education.
2 - Substantially increase the number of young people and adults with relevant qualifications, including technical and professional skills, for employment, decent work, and entrepreneurship.
3 - Ensure equal opportunities in university education, including for people in vulnerable situations.
4 - Promote the dematerialization of the teaching/learning process in a gradual way.

22. Keywords

Forces
Balance
Effort
Deformation
Diagrams
Structures

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23. Main Bibliography

Author(s):	Beer, F.; Johnston, E. R.		
Title:	Mecânica vetorial para engenheiros. Estática		
Edition:	junho de 2011	Year:	2009
Local:	Lisboa		
Publisher:	Mc-Graw Hill		
ISBN Code:			

Author(s):	Beer, F.; Johnston, E. R.		
Title:	Vector mechanics for engineers. Statics		
Edition:	april 2009	Year:	2009
Local:			
Publisher:	Mc-Graw Hill Education Europe		
ISBN Code:			

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

24. Complementary Bibliography

Author(s):	Apontamentos sobre equilíbrio de estruturas (Mestrado em Engenharia Civil. Mecânica I)		
Title:	Apontamentos sobre equilíbrio de estruturas (Mestrado em Engenharia Civil. Mecânica I)		
Edition:	2009/2010	Year:	2009
Local:	Lisboa		
Publisher:	IST		
ISBN Code:			

Author(s):	Cabrita Neves, I.		
Title:	Estatia e equilíbrio		
Edition:		Year:	2002
Local:	Lisboa		
Publisher:	IST		

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ISBN Code:

Ficha técnica MIP / MIP Datasheet	
Título / Title	Course Unit Program 'ESTÁTICA': Academic Year 2026/2027
Autor / Author	Prof. Doutor ANTÓNIO JOSÉ DÂMASO SANTOS MATOS VILHENA
Classificação / Classification	-
Descritores / Descriptors	-
Colaborador(es) / Colaborator(s	-
Data Hora / Date Time	
Formato de dados / Data Format	Texto / Text, PDF
Estatuto de utilização / Usage	Acesso público / Public Access
Relação / Relation	Version 1,0

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