UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Structural Concepts

Academic Year 2026/2027

1. Organic Unit

Faculty of Architecture and Arts

2. Course

Architecture

3. Cycle

2nd

4. Course Unit

Structural Concepts (01337)

5. Scientific Area

6. Curricular Year

4th

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 with the skills to understand the structural functioning of the various elements that make up a structure and the building as a whole.
Empower students with the basic concepts necessary for the structural design of buildings.

15. Specific Objectives

To develop students' skills for the correct definition of the location of the vertical elements of a structure compatible with the architecture.
Transmit the necessary knowledge to enable the definition of the structural solution appropriate to the proposed architecture.
Transmit the necessary knowledge to perform the pre-dimensioning of the various elements of a reinforced concrete structure.

16. Skills to be acquired

Ability to define the structural solution.
Ability to define a structural mesh.
Ability to pre-design various elements of a reinforced concrete structure.

17. Teaching Methodology

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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.

18. Course Unit Program

1. - Introduction to structural design
1.1 - Structures and architecture - objectives
1.2 - Structural requirements
1.3 - Types of Buildings' structural solutions
1.4 - Design of building structures

2. - Structural elements and systems
2.1 - Behaviors of structural elements (beam, column, wall, slab)
2.2 - Structural systems
2.3 - Traditional and non-traditional floors
2.4 - Foundations
2.5 - Design and safety verification

3. - Structures of reinforced concrete buildings
3.1 - Constituent materials
3.2 - Mechanical characteristics of reinforced concrete (characteristics and tests)
3.3 - Pre-dimensioning

4. - Composite structures
4.1 - Constituent materials
4.2 - Steel-concrete composite structures (characteristics and tests)
4.3 - Preliminary design

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

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.

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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.

Specific
1 - Ensure acc

22. Keywords

Structure, Building, Design, Dimensioning

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23. Main Bibliography

Author(s):
Title: NP EN 1990:2009 - Eurocódigo 0 - Bases para projeto de estruturas
Edition: Year: 2009
Local:
Publisher: Instituto Português da Qualidade
ISBN Code:

Author(s):
Title: NP EN 1991-1-1:2009 - Eurocódigo 1 - Ações em estruturas. Parte 1-1: Acções gerais. Pesos volúmicos,
Edition: Year: 2009
Local:
Publisher: Instituto Português da Qualidade
ISBN Code:

Author(s): Garrison, Philip
Title: Basic Structures for Engineers and Architects
Edition: 1.ª Year: 2005
Local: Oxford
Publisher: Blackwell Publishing Ltd
ISBN Code:

24. Complementary Bibliography

Author(s): Francis, A. J.
Title: Introducing structures : textbook for students of civil and structural engineering building and arch
Edition: 1.ª Year: 1980
Local: Nova York
Publisher: Pergamon Press
ISBN Code:

Author(s): Seward, Derek
Title: Understanding Structures - Analysis, materials, design
Edition: 4.ª Year: 2009
Local: Hampshire (UK)
Publisher: Palgrave Macmillan Limited

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