

<b>POLI</b> ESCOLA SUPERIOR TECNOLOGIA GESTÃO <b>TÉCNICO</b> <b>GUARDA</b>	<b>SUBJECT DESCRIPTION</b>	<b>MODELO</b> PED.013.03
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<i>Course</i>	Industrial Mechanics and Informatics					
<i>Subject</i>	Strength of Materials					
<i>Academic year</i>	2023/2024	<i>Curricular year</i>	2nd	<i>Study period</i>	1st semester	
<i>Type of subject</i>	Compulsory	<i>Student workload (H)</i>	Total: 162	Contact: 60	<i>ECTS</i>	6
<i>Professor(s)</i>	Paula Amaro					
<input checked="" type="checkbox"/> <i>Area/Group Coordinator</i> <input type="checkbox"/> <i>Head of Department</i>		José Reinas dos Santos André				

## PLANNED SUBJECT DESCRIPTION

### 1. LEARNING OBJECTIVES

The course aims to instruct and develop students' ability to solve mechanical problems in material point systems and rigid bodies at rest, to determine tensions and deformations at any point of elements subjected to axial, bending, shear and torsion stresses, and their combinations, and study the stress and strain states at one point as well as the instability of compressed bars. The students should be able to: Identify the different types of efforts that can act on a structure; Calculate the different stresses that are generated by the various requests/situations; Calculate the deformations associated with each type of request/situation; Identify complex requests/situations resulting from simple overlapping efforts; Calculate the stress state of a body on any plane; Identify the critical points of the sections.

### 2. PROGRAMME

Mass geometry;  
 Rigid body balance;  
 Internal efforts and effort diagrams;  
 Traction and compression;  
 Bending;  
 Shear;  
 Torsion;  
 Stress and strain states;  
 Instability;  
 Design of simple structures.

### 3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

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The syllabus allows students to develop skills in understanding the behavior of components subjected to different kinds of strengths. The chapters allow the student to acquire the basis for the design and understanding of the functioning of structures.

#### 4. MAIN BIBLIOGRAPHY

Beer & Jonhston, Resistência dos materiais, Makron Books, McGraw Hill, São Paulo, 2013  
 ISBN: 8534603448

Gomes, P.F., Resistência dos Materiais, Edição Autor, 2015. ISBN: 9789899869707

Hibbeler R. C. Mecânica para a Engenharia-Estática 10.ª Ed., Pearson Prentice Hall,São Paulo, 2005.  
 ISBN: 85-87918-97-4

Hibbeler R. C. Resistência dos materiais, Pearson, 2010. ISBN:9788576053736

Mott, R. L., Untener, J.A., Applied Strength Of Materials, Taylor & Feancis Lda, 2021. ISBN: 9781003173205

Silva, L., Gomes, J., Introdução à Resistência dos Materiais, Publindústria, 2010, ISBN: 9789728953553

#### 5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

Carrying out two tests for continuous assessment; exam and resource exam with the whole matter.

#### 6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

The teaching methodology has a special focus on the concept of learning by doing so that the students apply the theory via eminently practical exercises. The practical work allows students to apply what is taught step by step.

#### 7. ATTENDANCE

There are no minimum requirements, however attendance is strongly recommended.

#### 8. CONTACTS AND OFFICE HOURS

e-mail: paula.amaro@ipg.pt

office # 1

office hours: Wednesday: 16:00 – 17:00h ;Thursday: 10:00 – 11:30h

#### DATE

**31 de outubro de 2023**

#### SIGNATURES

*Professor(s), Area/Group Coordinator or Head of Department signatures*

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Professor

(signature)

Area/Group Coordinator

(signature)