

## SUBJECT TEACHING GUIDE

### G744 - Elasticity and Resistance of Materials I

#### Degree in Mechanical Engineering

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Mechanical Engineering			Type and Year	Compulsory. Year 3
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Elasticity and Strength of Materials Module in Common with the Industrial Branch				
Course unit title and code	G744 - Elasticity and Resistance of Materials I				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA ESTRUCTURAL Y MECANICA				
Name of lecturer	MIGUEL IGLESIAS SANTAMARIA				
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Other lecturers					

3.1 LEARNING OUTCOMES
- To recognize the strengths and weaknesses of the different methodologies studied

4. OBJECTIVES
To be familiar with the procedures used to determine the stress, strain and deformation in structural elements.
To be able to design structural elements
To be able to determine and evaluate deflections in the structural elements

6. SUBJECT PROGRAM	
CONTENTS	
1	Elasticity. Load and stresses. Cauchy stress tensor. Plane elasticity. Principal stresses. Mohr circle. Lamé elipsoid and equations. Problems.
2	Tensile stress. Yield point. Hooke's Law. Shear modulus. Poisson's ratio. Strain tensor. Laplace equation and problems.
3	Torsion stress. Torsion bending. Analogies.
4	Bending Stress. Navier. Shear stress, Collignon. Curvature radius. Bresse. Conjugated beams. Mohr theorems.
5	Shear stresses. Strength equation under shear. Bolts and rivets.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
First exam (part I)	Written exam	No	Yes	30,00
Second exam (parts II and III)	Written exam	No	Yes	30,00
Second exam (parts IV and V)	Written exam	Yes	Yes	30,00
	Work	No	Yes	10,00
TOTAL				100,00
Observations				
Observations for part-time students				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
<ul style="list-style-type: none"> <li>- Apuntes de clase</li> <li>- Ortiz Berrocal. Resistencia de Materiales. Litoprint Madrid</li> <li>- Ortiz Berrocal. Elasticidad. Mc Graw Hill</li> <li>- C. Hoppe Atienza – A. M. De Juan de Luna. Esfuerzos Axiales Teoría y problema. U.C.</li> <li>- Timoshenko. Resistencia de Materiales. Thomson España</li> </ul>