# SUBJECT TEACHING GUIDE

## G1080 - Mechanics and Resistance of Materials

## Degree in Marine Engineering

### Academic year 2023-2024

| 1. IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| Degree | Degree in Marine Engineering | | Type and Year | Compulsory. Year 2 |
| Faculty | School of Maritime Engineering | | | |
| Discipline | Subject Area: Mechanics and Strength of Materials | | | |
| Course unit title and code | G1080 - Mechanics and Resistance of Materials | | | |
| 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 | LUIS MIGUEL MUÑIZ GONZALEZ |
| E-mail | luismiguel.muniz@unican.es |
| Office | E.T.S. de Náutica. Planta: + 2. DESPACHO PROFESORES (242) |
| Other lecturers | |

## 3.1 LEARNING OUTCOMES

- Capacity for organization and planning.
  Solving exercises.
  Autonomous learning.
  Ability to apply knowledge in practical situations.
  Capacity for analysis and synthesis.
  Ability to manage information.
  Oral and written communication in the language.
  Decision making.
  Ability to communicate with experts in other areas.
  Critical thinking.
  Working on an interdisciplinary team.
  Adapting to new situations.
  Creativity.
  Ability to work autonomously.

## 4. OBJECTIVES

Develop in students the ability to analyze any problem of mechanics and strength of materials simply and logically and the ability to apply in solving the basic principles of the behavior of materials for the design of structural elements

## 6. COURSE ORGANIZATION

| | CONTENTS |
|---|---|
| 1 | Static point<br>Equilibrium of rigid bodies<br>inner strength<br>Shear and bending functions<br>Relations between charges<br>Determination and stability of structure<br>plane trusses<br>3D Applications<br>friction<br>dynamic<br>Field of velocities and accelerations |
| 2 | Stress<br>balance<br>Average normal stress<br>Average shear<br><br>axial load<br>Normal strain<br>Hooke's Law<br>elastic deformation<br>Hyperstatic axial load<br>thermal stress<br><br>torsion<br>Deformation of a circular shaft<br>Preliminary analysis of the efforts of a shaft<br>Torsion formula<br>Torsion angle<br>flexion<br>centroids<br>Parallel axis theorem<br>Deformation of straight members<br>Flexure formula<br>cutting<br>Shear in straight members<br>Formula shear<br>Shear beams<br><br>combined loads |

## 7. ASSESSMENT METHODS AND CRITERIA

| Description | Type | Final Eval. | Reassessn | % |
|---|---|---|---|---|
| Solving problems and theoretical questions | Written exam | Yes | Yes | 25,00 |
| Solving exercises | Work | Yes | Yes | 15,00 |
| Lab practices | Laboratory evaluation | Yes | Yes | 10,00 |
| Solving problems and theoretical questions | Written exam | Yes | Yes | 25,00 |
| Solving exercises | Work | Yes | Yes | 15,00 |
| Lab practices | Laboratory evaluation | Yes | Yes | 10,00 |
| TOTAL | | | | 100,00 |
| Observations | | | | |
| Overcoming these three blocks serve to pass the course. The final exam is the way to recovery. | | | | |
| Observations for part-time students | | | | |
| A personal study, from teacher demand, will have 30% of note, and final exam 70%. | | | | |

## 8. BIBLIOGRAPHY AND TEACHING MATERIALS

| BASIC |
|---|
| "Mecánica vectorial para ingenieros" Beer and Johnston.Ed. Mc Graw Hill. ISBN 0-07-079926-6<br>"Estática" Riley and Sturges.ISBN-84-291-4255-x<br>Apuntes de la asignatura |