

## SUBJECT TEACHING GUIDE

### G777 - Mechanical Design

#### Degree in Chemical Engineering First Degree in Chemical Engineering

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Chemical Engineering First Degree in Chemical Engineering			Type and Year	Compulsory. Year 3 Compulsory. Year 3
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Strength of Materials, Machines and Mechanisms Module: Compulsory Training in Common with the Industrial Branch				
Course unit title and code	G777 - Mechanical Design				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA ESTRUCTURAL Y MECANICA				
Name of lecturer	ALBERTO DIEZ IBARBIA				
E-mail	alberto.diez@unican.es				
Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 2. DESPACHO (S2046)				
Other lecturers					

### 3.1 LEARNING OUTCOMES

- The student will be able to solve problems regarding Strength of Materials, Material Fatigue, Tribology and Corrosion as well as their application to chemical engineering.
- The student must be capable of solving problems with regard to Noise and Vibrations as well as their influence on materials , mechanism and machine behaviour.
- The student will be able to perform a mechanical desing of component which are generally used in the chemical engineering field: pipes, pressure vessels, etc.

#### 4. OBJECTIVES

- Learning to solve problems regarding Strength of Materials, Material Fatigue, Tribology and Corrosion as well as their application to chemical engineering.
- Learning how to solve problems with regard to Noise and Vibrations as well as their influence on materials, mechanism and machine behaviour.
- Acquiring a knowledge of performing a mechanical desing of components which are generally used in the chemical engineering field: pipes, pressure vessels, etc.

#### 6. SUBJECT PROGRAM

CONTENTS	
1	Introduction to Mechanical Design and Strength of Materials
2	Dynamic analysis. Noise and Vibrations
3	Mechanical Design Fundamentals

#### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Midterm exam	Written exam	No	Yes	60,00
Final exam	Written exam	Yes	Yes	40,00
TOTAL				100,00
Observations				
<p>The used evaluation system agrees with Universidad de Cantabria legislation. The final grade of the course will be the result of the weighting of the different grades obtained in each of the blocks . When the result is less than 5.00 points or in any of the course blocks the student does not reach the minimum qualification, the remedial examn will consist of an examination of the corresponding blocks in the extraordinary call. No mark will be saved for successive courses.</p> <p>Given the current uncertain health situation, in case that the competent health and educational authorities do not allow a face-to-face evaluation, a distance evaluation modality will be adopted using telematic means.</p>				
Observations for part-time students				
Part-time students will jointly take the assessment tests with the other students.				

**8. BIBLIOGRAPHY AND TEACHING MATERIALS**

## BASIC

- "Ingeniería Mecánica. Estática y Dinámica". Riley Sturges Ed. Reverte
- "Mecánica vectorial para ingenieros, estática y dinámica", Beer, F. P.; Johnston, E. R., Ed. McGraw Hill
- "Apuntes de Mecánica. Estática. Teoría y Problemas". Niembro de la Bárcena, J.L. e Iglesias Santamaría, M
- "Apuntes de Mecánica. Dinámica. Teoría y Problemas". Niembro de la Bárcena, J.L. y De Juan de Luna, A.M.
- "Resistencia de materiales". L. Ortiz Berrocal
- "Vibraciones mecánicas en ingeniería". SPUPV, 1998. Santamarina P.,
- "Curso de medida y control del ruido y vibraciones". C. Hoppe Atienza
- "Esfuerzos Axiales. Teoría y Problemas". C. Hoppe Atienza - A. M. de Juan de Luna.
- "Torsión. Teoría y Problemas". C. Hoppe Atienza - A. M. de Juan de Luna.
- "Teoría de Máquinas". Cardona Foix, S. Ediciones UPC.
- "Diseño de Maquinaria". Norton, R. L., McGraw-Hill, 2005
- "Análisis de Fatiga en Máquinas". R. Aviles Ed. Thomson 2005.
- "Working Model3D. Tutorial Guide"
- "Working Model3D. User's Manual"