

## SUBJECT TEACHING GUIDE

### M2157 - Failure Modes in Materials

#### Master's Degree in civil Engineering, Canal and Port Engineering

Academic year 2022-2023

1. IDENTIFYING DATA					
Degree	Master's Degree in civil Engineering, Canal and Port Engineering			Type and Year	Optional. Year 2
Faculty	School of civil Engineering				
Discipline	SPECIALITY IN STRUCTURES, MATERIALS AND GEOTECHNICS				
Course unit title and code	M2157 - Failure Modes in Materials				
Number of ECTS credits allocated	3	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. CIENCIA E INGENIERIA DEL TERRENO Y DE LOS MATERIALES				
Name of lecturer	SERGIO CICERO GONZALEZ				
E-mail	sergio.cicero@unican.es				
Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 0. DESPACHO (0006)				
Other lecturers					

### 3.1 LEARNING OUTCOMES

- To apply models, theories and criteria in the assessment the performance and safety of structures containing cracks
- To apply failure models to fatigue, creep and stress corrosion cracking problems.

#### 4. OBJECTIVES

- To understand the causes of failures in materials, structural components and structures
- To know the different tools used in failure analysis.
- To be able to manage a failure analysis process, coordinating the different types of assessments being performed.
- To understand the importance of failure analysis in people safety, in the economy, in the environment and in the proper development of engineering

#### 6. COURSE ORGANIZATION

##### CONTENTS

1	Introduction to materials failure analysis
2	Failure mechanisms in engineering materials: fracture, fatigue, creep and corrosion
3	Failure analysis tools: chemical, microstructural and stress analyses, microscopy, structural integrity.
4	Case studies in failure analysis.
5	Course work: solving a real case

#### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Final exam	Written exam	Yes	Yes	40,00
Course work	Work	No	Yes	40,00
Continuous assessment	Others	No	No	20,00
TOTAL				100,00
Observations				
Laboratory practice is mandatory				
Observations for part-time students				
Part-time students will be evaluated from the final exam and the course work results, without continuous assessment. In any case, laboratory sessions are mandatory.				

#### 8. BIBLIOGRAPHY AND TEACHING MATERIALS

##### BASIC

Transparencias de la asignatura (S.Cicero), proporcionadas en moodle.