SUBJECT TEACHING GUIDE

M1436 - Failure Analysis

Master's Degree in Integrity and Durability of Materials, Components and Structures

Academic year 2021-2022

1. IDENTIFYING DATA					
Degree	Master's Degree in Integrity and Durability of Materials, Components and Structures			Type and Year	Compulsory. Year 1
Faculty	School of civil Engineering				
Discipline					
Course unit title and code	M1436 - Failure Analysis				
Number of ECTS credits allocated	4	Term		Semester based (2)	
Web					
Language of instruction	Spanish	English Friendly	Yes	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	ROBERTO LACALLE CALDERON BORJA ARROYO MARTINEZ

3.1 LEARNING OUTCOMES

- Knoledge
  Habilities
  Aptitudes
  Additional competences

4. OBJECTIVES

6. COURSE ORGANIZATION

CONTENTS	
1	Introduction to Failure Analysis
2	Fracture, Fatigue, Creep, and SCC in Failure Analysis
3	Failure Analysis tools
4	Case Studies (including 2.0 hours in evaluation activities)

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Personal report	Work	No	Yes	40,00
Course project	Others	No	Yes	20,00
Evaluation test	Written exam	No	Yes	40,00
TOTAL				100,00

Observations
40% individual course project 20% exposition of course project 40% final test
Observations for part-time students
Part-time students may follow UC evalutation guidelines for such circumstances

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Como material fundamental del curso se utiliza un texto o apuntes elaborados por el profesor de la asignatura que recoge los contenidos esenciales de la misma. También se utiliza un conjunto de artículos científicos que recogen casos prácticos resueltos que servirán para introducir a los alumnos en el proceso de análisis. Todos ellos se pondrán a disposición de los alumnos en el aula virtual.

Además, los estudiantes podrán utilizar los libros especializados de consulta ubicados tanto en la biblioteca general de los correspondientes campus universitarios como en los seminarios de los departamentos o áreas de conocimiento respectivos. Se citan a continuación un conjunto de publicaciones de consulta disponibles sobre los temas que componen la asignatura:

- Annual Book of ASTM Standards, Section 03.01. ASTM International, 1990.
- Das, A.K., Metallurgy of Failure Analysis, McGraw-Hill Professional, 1997.
- Duga, JJ. et al., Economic effects of fracture in the United States. Part 2. A report to NBS by Battelle Columbus Laboratories, 1983
- Milne, I., Engineering Failure Analysis, Vol. 1, Isuue 3, 1994, pp. 171–181
- Carper, KL., Learning from failures. In: K.L. Carper, Editor, Forensic Engineering, Elsevier, 1989, pp. 14–31
- Tada, H., Paris, P.C., Irwin, G.R., The Stress Analysis of Cracks Handbook, 2nd Edition, Paris Productions, Inc., St. Louis, 1985
- Murakami, Y., Stress Intensity Factors Handbook, Pergamon Press, New York, 1987
- Irwin, G.R., Trans. J. Appl. Mech. Vol. 24, 1958, pp. 361-364
- Anderson T. L., Fracture Mechanics: Fundamentals and Applications, 2nd edition, CRC Press, Boca Raton, 1995
- Broek, D., Elementary Engineering Fracture Mechanics, 3rd Edition, Martinus Nijhoff, The Hague, 1982
-The “Alexander L Kielland” accident, Norwegian Public Reports, Oslo, 1981
- Final report on the MV Estonia disaster – on the capsizing on 28 September 1994 in the Baltic sea of the Ro-Ro passenger vessel, The Joint Accident Investigation Commission, Republic of Estonia, 1997.
-Chapman, J.C., Collapse of the Ramsgate walkway. The Structural Engineer, Vol. 76, Issue 1, 1998, pp. 1–10