

SUBJECT TEACHING GUIDE

M1435 - Structural Integrity Assessment Procedures

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

Academic year 2022-2023

| 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 | M1435 - Structural Integrity Assessment Procedures | | | | |
| Number of ECTS credits allocated | 4 | Term | Semester based (2) | | |
| Web | | | | | |
| Language of instruction | Spanish | English Friendly | Yes | Mode of delivery | Face-to-face |

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| Department | DPTO. CIENCIA E INGENIERIA DEL TERRENO Y DE LOS MATERIALES | | | | |
| Name of lecturer | ROBERTO LACALLE CALDERON | | | | |
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| Office | E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 0. DESPACHO (0006) | | | | |
| Other lecturers | SERGIO CICERO GONZALEZ | | | | |

3.1 LEARNING OUTCOMES

-Students will become familiar with several structural integrity procedures in use today, being able to use them independently for performing structural integrity assessment of components.

4. OBJECTIVES

To know the particularities of the in-use structural integrity procedures

To perform structural integrity assessments based on the methodologies included in several procedures

To know the specific analysis methods for each failure mode of structures

| 6. COURSE ORGANIZATION | |
|------------------------|--|
| CONTENTS | |
| 1 | Introduction to structural integrity assessment procedures |
| 2 | Assessment techniques for fracture/plastic collapse |
| 3 | Assessment techniques for fatigue |
| 4 | Assessment techniques for creep |
| 5 | Assessment techniques for environmental degradation |
| 6 | Structural integrity software |
| 7 | Evaluation |

| 7. ASSESSMENT METHODS AND CRITERIA | | | | |
|--|-----------------------|-------------|-----------|--------|
| Description | Type | Final Eval. | Reassessn | % |
| Group works | Work | Yes | No | 40,00 |
| Final exam | Written exam | Yes | Yes | 50,00 |
| Laboratory workshop | Laboratory evaluation | Yes | Yes | 10,00 |
| TOTAL | | | | 100,00 |
| Observations | | | | |
| Course work is classified as a 'non-recoverable' activity insofar as it is prepared during the course of the subject | | | | |
| Observations for part-time students | | | | |

| 8. BIBLIOGRAPHY AND TEACHING MATERIALS |
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| BASIC |
| FITNET Fitness-for-Service (FFS) Procedure - Volume 1, M. Kocak, S. Webster, J.J. Janosch, R.A. Ainsworth, R. Koers, eds., ISBN 978-3-940923-00-4, Printed by GKSS, Germany, 2008. |
| -BS7910:2019, Guide to methods for assessing the acceptability of flaws in metallic structures, British Standards, 2019. |
| -R6: Assessment of the Integrity of Structures Containing Defects, British Energy Generation, Report R/H/R6, Revision 4, 2001. |
| -R5, Assessment Procedure for the High Temperature Response of Structures, Procedure R5 Issue 3, British Energy, Gloucester, UK, 2003. |
| -API 579, Recommended Practice for Fitness for Service, Draft Issue 4, American Petroleum Institute, 1996. |
| -ASME Boiler and Pressure Vessel Code, Section XI, Rules for In-Service Inspection of Nuclear Power Plant Components, The American Society of Mechanical Engineers, 2010. |