

SUBJECT TEACHING GUIDE

M1444 - Mechanics of Continuous Media

Master's Degree in Civil Engineering

Academic year 2019-2020

| 1. IDENTIFYING DATA | | | | | |
|----------------------------------|---------------------------------------|------------------|--------------------|--------------------|--------------|
| Degree | Master's Degree in Civil Engineering | | Type and Year | Compulsory. Year 1 | |
| Faculty | School of civil Engineering | | | | |
| Discipline | Mechanics of Continuous Media | | | | |
| Course unit title and code | M1444 - Mechanics of Continuous Media | | | | |
| Number of ECTS credits allocated | 6 | Term | Semester based (1) | | |
| Web | | | | | |
| Language of instruction | Spanish | English Friendly | No | Mode of delivery | Face-to-face |

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|------------------|--|--|--|--|
| Department | DPTO. INGENIERIA ESTRUCTURAL Y MECANICA | | | |
| Name of lecturer | JOSE RAMON IBAÑEZ DEL RIO | | | |
| E-mail | jose.ibanez@unican.es | | | |
| Office | E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 2. DESPACHO (2069) | | | |
| Other lecturers | CLAUDIO LOPEZ CASTILLO | | | |

3.1 LEARNING OUTCOMES

- Develop an understanding of the stresses and strains concept and analysis from a graphic and tensor views.
- Develop an understanding of the linear elasticity equations and their applications.
- Develop an understanding of Prandtl's Torsional Theory
- Develop an understanding of the yield criterions.
- Develop an understanding of the plastic analysis of structures.

4. OBJECTIVES

The student should acknowledge the concepts of tension and shear and apply these concepts to the resolution of problems about continuum mechanics, linear elasticity, yield criterion and plastic analysis of structures.

6. COURSE ORGANIZATION

CONTENTS

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| 1 | Stresses analysis Strains analysis |
| 2 | Linear elasticity: Cartesian Coordinates Cylindrical Coordinates Prandtl's Torsional Theory |
| 3 | Yield criterions. |
| 4 | Plastic analysis of structural cross sections Plastic analysis of structures |

7. ASSESSMENT METHODS AND CRITERIA

| Description | Type | Final Eval. | Reassessn | % |
|--|--------------|-------------|-----------|--------|
| Classroom solved exercises | Others | No | No | 10,00 |
| 1st partial exam | Written exam | No | Yes | 45,00 |
| 2nd partial exam | Written exam | No | Yes | 45,00 |
| TOTAL | | | | 100,00 |
| Observations | | | | |
| <p>To be able to pass by midterm exams student shall deliver in time the exercises proposed by the Professor and laboratory practices. Those students who do not meet this requirement and are not part-time students will pass the course by the tests on February or September.</p> <p>The total content of the subject corresponds to the sum of the of the two midterm exams.</p> <p>The student who had passed one of the midterm exams will be liberated from doing it in the exams of February or September.</p> <p>The student who passed the two midterm exams will not have to go to the final exams of February or September.</p> | | | | |
| Observations for part-time students | | | | |
| Part-time student must pass the two midterm exams either past the general exam of February or September. | | | | |

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Mecanica de los Medios Continuos I (Teoria) J.Diaz del Valle. Servicio de Publicaciones ETS de Ingenieros de Caminos de Santander

Mecanica de los Medios Continuos II (Problemas) J.Diaz del Valle. Servicio de publicaciones ETS de Ingenieros de Caminos de Santander

Teoria de la Elasticidad. Timoshenko. Editorial Urmo

Calculo Plastico de Estructuras. Carlos Benito. Escuela de Ingenieros de Caminos. Madrid

Mecánica de Fluidos. Teoría y Problemas . Volúmenes I y II. J.F.Douglas . Ed. Bellisco

