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Biomechanics of continuum media I (solids)

Academic Year: (2019 / 2020) **Review date: 28-04-2016**

Department assigned to the subject: Continuum Mechanics and Structural Analysis Department

Coordinating teacher: RODRIGUEZ MARTINEZ, JOSE ANTONIO

Type: Compulsory ECTS Credits : 6.0

Year : 2 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Calculus I
Calculus II
Linear Algebra

OBJECTIVES

Introduction of the basic concepts of continuum mechanics for the analysis of elastic and viscoelastic solids.
Ability to formulate fundamental problems of solids mechanics, assessing the hypothesis and interpreting their results

DESCRIPTION OF CONTENTS: PROGRAMME

Chapter 1. Introduction to continuum mechanics applied to living and inert solids

Chapter 2. Stress, strain and compatibility conditions

Chapter 3. Derivation of the field equations and boundary conditions

Chapter 4. Properties of most common solids

Chapter 5. Constitutive equations of continuum mechanics: elasticity

Chapter 6. Constitutive equations of continuum mechanics: viscoelasticity

LEARNING ACTIVITIES AND METHODOLOGY

Every week a keynote lecture (large group)and a practical session (small group) will be delivered. The former is aimed at the acquisition of theoretical knowledge and the latter is aimed at the acquisition of practical skills related to theoretical concepts. Additionally, two lab sessions will be delivered in specific time in small groups (maximum 20 students).
The students will have the possibility of personal tutorials on the corresponding schedule. There will be a collective mentoring session at the 15th week of the calendar at the time scheduled for the keynote lecture.

ASSESSMENT SYSTEM

End of term examination (mandatory): 60%
- The minimum mark on the final examination for taking into account the mark obtained during the continuous assessment is 4.5 over 10
Continuous assessment: 40% split up into:
- Lab sessions: 15%
- 2 Partial exams: 25%

% end-of-term-examination: 60

% of continuous assessment (assigments, laboratory, practicals…): 40

BASIC BIBLIOGRAPHY

- Federico Paris Carballo Teoría de la elasticidad, Universidad de Sevilla, 1998

- Flügge Wilhelm Viscoelasticity, Springer-Verlag .

- Oliver, X.; Agelet, C. Mecánica de medios continuos para ingenieros, UPC.

- Ortiz Berrocal, L Elasticidad, Ed. McGraw Hill.

- SAMARTIN, A Curso de Elasticidad, Bellisco, 1990

- Federico Paris Carballo Teoría de la elasticidad, Universidad de Sevilla, 1998

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