

Academic Year: (2023 / 2024)

Review date: 28-03-2023

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

Coordinating teacher: GARCIA GONZALEZ, DANIEL

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Linear Algebra
 Calculus I, Calculus II, Calculus III
 Mechanics of Structures
 Elasticity and Strength of Materials

SKILLS AND LEARNING OUTCOMES

CB1. Students have demonstrated possession and understanding of knowledge in an area of study that builds on the foundation of general secondary education, and is usually at a level that, while relying on advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study

CB2. Students are able to apply their knowledge to their work or vocation in a professional manner and possess the competences usually demonstrated through the development and defence of arguments and problem solving within their field of study.

CB3. Students have the ability to gather and interpret relevant data (usually within their field of study) in order to make judgements which include reflection on relevant social, scientific or ethical issues.

CB5. Students will have developed the learning skills necessary to undertake further study with a high degree of autonomy.

CG1. Ability to solve problems with initiative, decision-making, creativity, critical reasoning and to communicate and transmit knowledge, skills and abilities in the field of Industrial Engineering.

CG3. Ability to design a system, component or process in the field of Industrial Technologies to meet the required specifications

CG4. Knowledge and ability to apply current legislation as well as the specifications, regulations and mandatory standards in the field of Industrial Engineering.

CG5. Adequate knowledge of the concept of company, institutional and legal framework of the company. Organisation and management of companies.

CG6. Applied knowledge of company organisation.

CG8. Knowledge and ability to apply quality principles and methods.

CG9. Knowledge and ability to apply computational and experimental tools for the analysis and quantification of Industrial Engineering problems.

RA1. Knowledge and understanding: Have basic knowledge and understanding of science, mathematics and engineering within the industrial field, as well as knowledge and understanding of Mechanics, Solid and Structural Mechanics, Thermal Engineering, Fluid Mechanics, Production Systems, Electronics and Automation, Industrial Organisation and Electrical Engineering.

RA2. Engineering Analysis: To be able to identify engineering problems within the industrial field, recognise specifications, establish different resolution methods and select the most appropriate one for their solution

RA4. Research and Innovation: To be able to use appropriate methods to carry out research and make innovative contributions in the field of Industrial Engineering.

OBJECTIVES

Tensorial calculus

Solid mechanics formulation for finite (large) deformations

Development of constitutive equations to describe the mechanical behaviour of biological tissues

Application of solid mechanics theories to real problems in bioengineering

DESCRIPTION OF CONTENTS: PROGRAMME

Fundamentals of tensorial algebra

Kinematics of deformable solid: finite (large) deformations

Stress measurements

Balance equations: Lagrangian and Eulerian descriptions

Constitutive equations for biological solids

Applications to engineering problems: biostructures

ASSESSMENT SYSTEM

Continuum assessment system based on reports, class participation and skills and knowledge tests.

A minimum grade of 4.5 in the final exam (either ordinary or extraordinary exams) is required to take into account the continuum assessment.

% end-of-term-examination:	60
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% of continuous assessment (assignments, laboratory, practicals...):	40
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