

69302 - Biomechanics and Biomaterials

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	547 - Master's in Biomedical Engineering
ECTS	6.0
Course	1
Period	First semester
Subject Type	Compulsory
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The teaching methodology is structured in three levels: theoretical classes where the main subject contents are presented and discussed, student participation is encouraged; also computer lab sessions and development of practical tasks based on a real application or specific research activity are proposed.

5.2.Learning activities

There will be the following activities:

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A01 Theoretical classes with the active involvement of the student (48 hours). The main course contents are presented.

A03 Lab sessions (8 hours). Different lab sessions are carried out in the laboratory or in the computer room. Notes for each lab session where the different activities are planned will be available before the session, which should be read before the lab session. The student should present a report of the corresponding lab session.

A05 Development of practical tasks. Different activities/tasks are proposed related with the main contents of the course

A06 Tutorship. Students may solve any questions they might have about unclear contents of the course

A08 Assessment . The student will take an exam of Biomechanics and other of Biomaterials or a one of both parts. Moreover, several reports derived from the computer lab sessions and derived from the development of practical tasks will be evaluated and the practical tasks.

5.3.Program

Part I: Biomechanics

1. Fundamentals of Mechanics
2. Fundamentals of Continuum Mechanics
3. Biomechanics of musculoskeletal system
4. Mechanics of hard tissues
5. Mechanics of soft tissues

Part II: Biomaterials

1. Concepts of biocompatibility
2. Types of biomaterials and properties
3. Application to implant prosthesis, scaffolds and drug delivery systems
4. Legal context.

5.4.Planning and scheduling

The course calendar is defined by the Escuela de Ingeniería y Arquitectura calendar.

5.5.Bibliography and recommended resources

BB Biomaterials / edited by Joyce Y. Wong, Joseph D. Bronzino Boca Raton [Florida] : CRC Press, cop. 2007

BB Chen, Qizhi. Biomaterials : a basic introduction / Qizhi Chen, George Thouas Boca Raton, (Florida) : CRC Press, Taylor & Francis Group, cop. 2015

BB Fung, Yuan Cheng. Biomechanics: Motion, Flow, Stress and Growth / Fung Y.C.. Springer Verlag, 1990

BB Fung, Yuan Cheng. Biomechanics. Mechanical properties of living tissues / Fung Y.C.. Springer-Verlag, 1993

BB Joint replacement technology / edited by Peter A. Revell . - 1st pub. Cambridge (England) : Woodhead, 2008

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BB Knudson, Duane. Fundamentals of Biomechanics / Duane Knudson. - 2th Edition Springer Verlag, 2007

BB Park, J. Biomaterials: An introduction / J. Park, R.S. Lakes. Springer 2007

- Web page of the subject available in add.unizar.es