

69324 - Scientific visualization and representation techniques

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	547 - Master's in Biomedical Engineering
ECTS	3.0
Course	1
Period	Second semester
Subject Type	Optional
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 learning methodologie will develop itself at several levels:

- theoretical classes where the needed subject contents are presented and discussed, ad where student participation is encouraged
- computer lab sessions, where the students develop the theoretical concepts with the use of computer applications specifically designed for data visualization
- development of practical tasks of greater complexity, based on a real application or specific research activity, ususally related with the student's PhD work.

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This steps try to encourage continuous on-going work for students.

5.2.Learning activities

The learning process for this subject is based on the following activities:

A01 Theoretical classes with active involvement (16 hours). The main subject contents are presented, always using example problems related to Bio-Engineering.

A03 Computer lab sessions . (10 hours). Lab sessions are carried out intermixed with theoretical sessions, in the same classroom. Students use their own computers/laptops, with software supplied by the teacher. Only free or public software is used .

A05 Development of a practical assignment, more complex than the lab sessions . Students can solve this task individually or in pairs, and both documentation and a public presentation are required.

A06: Tutor ship . Students may solve any questions they might have about unclear contents of the course, lab sessions or assignments

A08: Assessment . The students will take an exam, and several reports derived from the computer lab sessions and from the development of the practical assignment will be evaluated.

5.3.Program

Subject Programm:

Theoretical Part:

- ¿What is really Data Visualization?
- ¿What are Computer Graphics?
- Basic Data representation and modelling
- Data Visualization Algorithms
- Visualization in Biomedic Engineering

Practice:

- Three-dimensional data processing
- Interactive applications for scientific data visualization: Paraview
- Interactive applications for medical data visualization : 3DSlicer
- Intro to specific application development: VTK

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 Computer Graphics. Principles and practice. J. F. Hughes, A. Van Dam,... Addison Wesley. ISBN. 978-0-321-39952-6

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BB The Visualization Toolkit. W. Schroeder, H. Martin, B. Lorensen, <http://www.kitware.com>, ISBN. 0-13-954694-4, 2002

Slides and docs used in classes