

Academic Year: (2023 / 2024)

Review date: 27-03-2023

Department assigned to the subject: Telematic Engineering Department

Coordinating teacher: IBÁÑEZ ESPIGA, MARIA BLANCA

Type: Electives ECTS Credits : 3.0

Year : Semester :

OBJECTIVES

By the end of the course, the student will be able to:

- ¿ Know the basic principles of modeling techniques in three dimensions
- ¿ Know how to design simple objects in 3D using OpenGL
- ¿ Design simple three-dimensional scenes using a program of computer-aided design (CAD)
- ¿ Improve the realism of objects and scenes using computer graphics techniques taught in the course
- ¿ Include simple scenes 3D virtual environments

Students will develop the following skills:

- ¿ Ability to apply principles of computer graphics in modelling three-dimensional objects and scenes
- ¿ Ability to design 3D objects and scenes optimizing the rendering time and space required to store the models
- ¿ Ability to use development environments and third-party code libraries in the project development

DESCRIPTION OF CONTENTS: PROGRAMME

This course is an introduction to the basic techniques of three-dimensional modelling and integration in virtual worlds The program will include the following topics::

1. Introduction
 - ¿ Steps in designing 3D models
 - ¿ OpenGL, basics
 - ¿ Basic functionality expected in CAD tools
 - ¿ Web pages models and 3D virtual worlds
2. Basic techniques of drawing 3D models
 - ¿ Drawing geometric primitives
3. Visualization Techniques
 - ¿ Transformation processes, modeling and projection.
4. Using color and brightness
 - ¿ Lighting of objects
 - ¿ Using multiple light sources
 - ¿ Change of material properties
5. Techniques to improve scenes
 - ¿ Blending
 - ¿ Antialiasing
 - ¿ Fog
6. Modelling of 3D objects
 - ¿ Modelling with OpenGL library
 - ¿ Use of an aided design tool for generating computer scenes
 - ¿ Integration of 3D scenes in virtual platforms

LEARNING ACTIVITIES AND METHODOLOGY

Activities to be carried out:

- Lectures, doubt solving classes in small groups, student presentations, tutorials and personal work, including study, tests and examinations; oriented knowledge acquisition.
- Laboratory practices and practice of problems in small groups, individual tutorials and personal work, including study, tests and exams, aimed at the acquisition of practical skills related to each subject program.

- Within these activities, 40% of the credits in each subject are work that develops in the presence of teachers (lectures, questions and problems solving, laboratory classes, etc).

ASSESSMENT SYSTEM

The evaluation system includes continuous assessment of student work (papers, reports of laboratory practice, class participation and skills assessment tests and theoretical and practical knowledge), and evaluation through a final written exam is comprehensively assess the knowledge, skills and abilities acquired during the course.

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