# SUBJECT TEACHING GUIDE

## G1749    - Computer Animation and Video Games

## Degree in Computer Systems Engineering

### Academic year 2022-2023

| 1. IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| Degree | Degree in Computer Systems Engineering | | Type and Year | Optional. Year 4 |
| Faculty | Faculty of Sciences | | | |
| Discipline | Subject Area: Computer Animation and Videogames<br>Optional Module | | | |
| Course unit title and code | G1749    - Computer Animation and Video Games | | | |
| Number of ECTS credits allocated | 6 | Term | Semester based (1) | |
| Web | https://moodle.unican.es/course/view.php?id=12162 | | | |
| Language of instruction | English | | Mode of delivery | Face-to-face |


| Department | DPTO. MATEMATICA APLICADA Y CIENCIAS DE LA COMPUTACION |
|---|---|
| Name of lecturer | ANDRES IGLESIAS PRIETO |
| E-mail | andres.iglesias@unican.es |
| Office | E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 1. DESPACHO PROFESORES (1024) |
| Other lecturers | |

## 3.1 LEARNING OUTCOMES

- Knowledge and understanding of the workflow in the design and creation processes of computer animations and video games, its main stages and components, as well as its connections and interrelationships and the most important techniques for each stage of the process.

- Acquisition of knowledge and skills necessary for the student to deepen autonomously in the fields of computer animation and video game design and development.

- Understanding the basics of the main methods of computer animation and video game design and development, and possible ways of implementation, as well as their applications in the professional arena.

- Knowledge of how do the main graphics design and animation packages and programs for video game generation work, their main advantages and limitations.

- Knowledge of what is the purpose of the computer animation and video game generation and what are the pillars on which these disciplines are settled.

## 4. OBJECTIVES

The student must be able to analyze and design a small computer generated animation using graphical techniques and should be able to explain clearly both orally and in writing the whole process of pipeline animation since its inception.

Students should understand and be able to explain the fundamentals of the design and creation of a video game, and detail the most important aspects of the video game generation and a possible implementation. Also, they should be able to replicate the main stages and tasks of the whole process of video game creation.

## 6. COURSE ORGANIZATION

| CONTENTS |
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| 1 | Organization of the course. Basic bibliography and other sources of information. Hardware and software for computer animation and video games. Relevant examples and scope. Animation and special effects in movies. Fundamentals of animation and computer animation. Case studies. Graphical pipeline of computer animation. Virtual humans. Modeling and animation of synthetic actors. Behavioral animation. Artificial intelligence. Cognitive models. Computer shape modeling. Free-form shape modeling. Computer lab: Synthetic actors generation. Computer lab: Synthetic actors animation. Computer lab: 2D shape modeling. Introduction to video games. History of video games. Types of video games. Video games generation pipeline. Artificial intelligence for video games. IA of NPCs. Digital production. Final subject project. |

## 7. ASSESSMENT METHODS AND CRITERIA

| Description | Type | Final Eval. | Reassessn | % |
|---|---|---|---|---|
| Project-based evaluation (85%). | Work | No | Yes | 85,00 |
| Computer lab training (15%). | Laboratory evaluation | No | Yes | 15,00 |
| TOTAL | | | | 100,00 |

**Observations**

There is no written exam for the subject. Given the practical nature of the course, the final evaluation consists of the presentation and submission of all materials of the project (including software code).

Attendance to computer lab training is mandatory, except on justified grounds. In such a case, computer lab training can be replaced by assignments providing a similar set of skills and abilities.

**Observations for part-time students**

Part-time students unable to attend the classroom activities can ask for alternative assignments for assessment of such activities.

## 8. BIBLIOGRAPHY AND TEACHING MATERIALS

**BASIC**

David H. Eberly: "3D game design". Elsevier. ISBN: 978-0-12-229063-3

"Game Programming Gems". Vols. 1 al 7. Charles River Media. ISBN: 1-58450-450-1

Alan Watt, Fabio Policarpo: "Advanced Game Development with Programmable Graphics Hardware". A K Peters, Ltd. ISBN: 156881240X

Martin J. Davis (editor): "Computer Graphics". Nova Publishers (2011). ISBN: 978-1-61761-811-6.