Program	59SO – Sound and Image Engineering B.Eng.

Course number and name	
Number	595010145
Name	Image Synthesis and Computer Animation
Semester	S6 [(February-June)]

Credits and contact hours	
ECTS Credits	4,5
Contact hours	45

Coordinator's name	Rendón Angulo, Enrique [enrique.rendon@upm.es]

Specific course information
Description of course content

The student is introduced in a practical way to the development of 3D video games and in a group dynamics for the creation of a small video game project.

The aim is the training as a programmer / videogame integrator focused on technical elements (instead of the artistic ones). This professional profile needs a general knowledge of all areas of a video game: integration of resources, gameplay programming, creation of control elements, management and organization project.

The following items would be learnt:
- Design and documentation of a video game
- Game-oriented 3D modeling, texturing and animation
- Basic logic and control in a video game
- Management and integration of a video game project

The open source program Blender is used for modeling, texturing and animation, and Unity 3D is used as the engine. Other tools are recommended for audio and image editing: Audacity, Gimp.

The course is organized in laboratory sessions with embedded theory. The students use a PC in all the lessons. In addition to the 3h per week of laboratory the student will need on average another 2h per week for the development of the course.

The realization of the project may require an additional effort always shared between the three classmates; the workload depends on the type of project and on the involvement of the students. In general, students are recommended to be conservative regarding the proposed objectives.

List of topics to be covered

1. Design of a video game
    1.1. Design document and manual
    1.2. Gameplay and game mechanics
    1.3. Level design

2. Elements of a video game
        2.1. Resources: Creation, edition and import
        2.2. Game Objects and Scenes: basic Unity
        2.3. Control elements: scripts, events, animators
3. Creation of 3D content for video games
        3.1. Modeling oriented to video game
        3.2. Textured: UV unwrapping, painted, baking
        3.3. Characters: Rig and Animation
4. Construction, management and integration of a video game in Unity
        4.1. Basic logic: C # and Monobehavior
        4.2. Specific areas of control
        4.3. Interface, scenes and levels.

Prerequisites or co-requisites

- Sound and Image Fundamentals
- Image and Video Technologies

Specific goals for the course

Specific outcomes of instruction

- RA609 – To generate 3D environments thanks to the integration of the created models and to the control of lighting, cameras, and other elements of environment.
- RA325 – To generate interactive 3D applications with synchronized audio.
- RA608 – To generate 3D models with monitored appearance, animation and interactive behavior.

Further reading and supplementary materials

- Blender: Curso de iniciacion. Merce Galan. Infor Book. S Ediciones, 2007.
- Unity 3D. MARC LIDON MAÑAS. Ed. Marcombo. ISBN: 9788426726827.
- Blender. Curso Práctico. Lidon Mañas, Marc. ISBN 978-84-9964-712-8. Ed. RA-MA.
- Animación de personajes con Blender (Diseño y creatividad). Tony Mullen. Anaya Multimedia. 2007.
- Blender: Modelado y Animación para Aplicaciones Interactivas". Sandra Moreno de Andrés. Mayo 2012.
- Hagamos Videojuegos. Canal YouTube para Unity: https://www.youtube.com/user/juande
- Escuela de Videojuegos. Canal
- YouTube para Unity: https://www.youtube.com/user/Servorius
- Youtube linked to the course.