

804351 - VJ3D-A - 3D Video Games

Coordinating unit:	804 - CITM - Image Processing and Multimedia Technology Centre	
Teaching unit:	804 - CITM - Image Processing and Multimedia Technology Centre	
Academic year:	2019	
Degree:	BACHELOR'S DEGREE IN DESIGN, ANIMATION AND DIGITAL ART (Syllabus 2017). (Teaching unit Optional)	
ECTS credits:	6	Teaching languages: Catalan

Teaching staff

Coordinator:	Löpfe, Lasse
Others:	Ripoll Tarré, Marc

Degree competences to which the subject contributes

Specific:

CEAAD 3. (ENG) Dominar el gran abanico de herramientas profesionales del sector para la elaboración de contenidos digitales de todo tipo.

CEAAD 7. (ENG) Aplicar técnicas de modelado y animación avanzada, postproducción y efectos especiales para la elaboración de contenidos digitales y/o su inclusión en ámbitos profesionales del arte digital como en la industria cinematográfica y la del videojuego.

Transversal:

04 COE. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.

05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.

06 URI. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.

07 AAT. SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.

03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

Teaching methodology

Exhibition and learning of new contents through theory, references and practical cases.

Participatory class where to develop activities for the resolution of problems and discussion of contents.

Practical work to apply and experiment with the contents seen in class. Exercises will be proposed to work during the week and improve the experience needed to master 3D design tools.

Learning objectives of the subject

- Be able to model characters, objects and scenarios in low polygonization.
- Show knowledge, identify and know how to apply the different techniques of shaders as well as the advanced elaboration of textures.
- Know the theoretical aspects of the different techniques of advanced illumination as well as being able to carry them out through the different existing tools.
- Show knowledge about the concepts of animation tree and blending animation for inclusion in interactive projects.
- Know the need and the different 3D optimization techniques for the massive inclusion of resources (scenarios,



804351 - VJ3D-A - 3D Video Games

characters and objects) in video games and virtual applications.

Study load

Total learning time: 150h	Hours large group:	18h	12.00%
	Hours medium group:	26h	17.33%
	Hours small group:	0h	0.00%
	Guided activities:	16h	10.67%
	Self study:	90h	60.00%

804351 - VJ3D-A - 3D Video Games

Content

<p>Introduction to Unity 3d</p>	<p>Learning time: 10h Theory classes: 4h Self study : 6h</p>
<p>Description: The Unity environment Game Objects Components Transform Renderer Parenting Pivots Prefabs Tags Layers</p>	
<p>Fisics</p>	<p>Learning time: 18h Theory classes: 9h Guided activities: 3h Self study : 6h</p>
<p>Description: Rigidbody Colliders Types of colliders Collision detection Forces Physical materials Effectors</p>	
<p>Introduction to scripting</p>	<p>Learning time: 10h Theory classes: 4h Self study : 6h</p>
<p>Description: Custom Components MonoBehaviour: Start(), Update() Single Responsibility Pattern Events – Collision and Triggers Game Loop, Execution Order</p>	

804351 - VJ3D-A - 3D Video Games

<p>Illumination</p>	<p>Learning time: 10h Theory classes: 4h Self study : 6h</p>
<p>Description: Types of lights Shadows Global Illumination Baking Light Probes Reflection Probes</p>	
<p>Terrains</p>	<p>Learning time: 14h Practical classes: 4h Guided activities: 4h Self study : 6h</p>
<p>Description: Height map Splash map Details & Vegetation Paths</p>	
<p>Animation</p>	<p>Learning time: 21h Theory classes: 9h Guided activities: 6h Self study : 6h</p>
<p>Description: The Animation window The animator State Machines Transitions Control animator from script State Machine Behaviours</p>	

804351 - VJ3D-A - 3D Video Games

<p>Game control</p>	<p>Learning time: 21h Practical classes: 6h Guided activities: 6h Self study : 9h</p>
<p>Description: Win / loose conditions Time scale Singleton Scene Loading</p>	
<p>GUI</p>	<p>Learning time: 19h Practical classes: 9h Guided activities: 4h Self study : 6h</p>
<p>Description: GUI elements Canvas Anchoring GUI animation Event system World vs screen space HUD</p>	
<p>Particle systems</p>	<p>Learning time: 21h Practical classes: 9h Guided activities: 6h Self study : 6h</p>
<p>Description: Modules Base Emission Shape Lifetime Noise External forces Trails Renderer Submitters Control from script</p>	

804351 - VJ3D-A - 3D Video Games

<p>Audio</p>	<p>Learning time: 6h Theory classes: 2h Guided activities: 1h Self study : 3h</p>
<p>Description: Audio source Audio Listener Audio Manager Audio Mixer</p>	

Planning of activities

<p>Development of a video game</p>	<p>Hours: 33h 20m Practical classes: 13h 20m Self study: 20h</p>
<p>Description: The students will work in groups developing the different tasks of a video game, from the part of design and art to simple programming tasks. The activity will be structured in tasks and oriented to create a unique set game.</p> <p>Support materials: Class documentation, Adobe photoshop, Unity 3d, Autodesk maya, visual studio.</p> <p>Descriptions of the assignments due and their relation to the assessment: In the corresponding folder on the virtual campus, according to the documentation given to the subject.</p> <p>Specific objectives: Design a functional game, following the guides explained in class.</p>	

Qualification system

1 exercise with a weighting of 20% of the final grade of the subject.
1 exercise with a weighting of 20% of the final grade of the subject.
1 exercise with a weighting of 40% of the final grade of the subject.
Final evaluation of the final game - 10% of the final mark of the subject.
Participation and attitude of learning: the evaluation of the participation of the student in the formative activities of the subject, and the attitude of learning, will be evaluated by means of a follow-up of his interventions in class and the proportion of exercises and practices presented. This evaluation corresponds to 10% of the final grade.



804351 - VJ3D-A - 3D Video Games

Regulations for carrying out activities

A part of the exercises can be done during the classes with the teacher of the subject. Students will also have to dedicate independent work time (out of hours) to perform the exercises. To do this, you must follow the instructions specified in the working document.

The exercise once finalized will be deposited in the Virtual Campus in the delivery of the classroom of the section in the corresponding date, will only be taken into account to value those exercises delivered before the 24:00 hours of the deadline.

Bibliography