Course guide

Information about the subject

Degree: Degree in Design and Narration in Animation and Video games

Faculty: Faculty of Legal, Economic and Social Sciences

Code: 2050110 **Name:** 3D modelling and representation I

Credits: 6,00 **ECTS Year:** 1 **Semester:** 1

Module: 3D MODELLING AND ANIMATION

Subject Matter: THREE-DIMENSIONAL MODELLING **Type:** Compulsory

Department: -

Type of learning: Classroom-based learning

Languages in which it is taught: Spanish

Lecturer/-s:

2051A   Jose Maria Lajara Romance **(Responsible Lecturer)**   jlajara@ucv.es

2050110 - 3D modelling and representation I

Module organization

3D MODELLING AND ANIMATION

Subject Matter	ECTS	Subject	ECTS	Year/semester
THREE-DIMENSIONAL MODELLING	24,00	3D Digital sculpture and character modelling I	6,00	3/1
		3D Digital sculpture and character modelling II	6,00	3/1
		3D modelling and representation I	6,00	1/1
		3D modelling and representation II	6,00	2/1
THREE-DIMENSIONAL ANIMATION	18,00	3D Animation	6,00	2/2
		3D Character Animation I	6,00	2/2
		3D Character Animation II	6,00	3/1

Recommended knowledge

Basic use of the computer.

Prerequisites

In order to take the subject Modelling and Representation in 3D II, it is essential to have passed the subject Modelling and Representation in 3D I.
- In order to take the subject Character Modelling and Digital Sculpting I it is essential to have passed the subjects 3D Modelling and Representation I and 3D Modelling and Representation II.
and Representation in 3D II
- In order to take the subject Character Modelling and Digital Sculpting II, it is essential to have passed the subject Character Modelling and Digital Sculpting I

Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

R1	To produce a work in which original and innovative ideas and proposals in the process of modelling inorganic objects are expressed.
R2	To cooperatively model scenarios and inorganic objects in three dimensions.
R3	To use the vocabulary specific to the area of 3D modelling and demonstrate it in a written test.
R4	To analyse the structure of real or fictitious objects and show this in the development of their inorganic modelling work.
R5	To digitally develop basic materials and apply them to inorganic three-dimensional models.
R6	To model inorganic three-dimensional objects using simple techniques (extrusion, revolution, Boolean operations, etc.).
R7	To produce a work in which original and innovative ideas and proposals for the three-dimensional modelling of complex inorganic objects are expressed.
R8	To apply the new trends in the field of three-dimensional modelling, incorporating them into their projects.
R9	To use the specific vocabulary developed in the subject and demonstrate it in a written test
R10	To digitally model complex inorganic three-dimensional objects by means of specific techniques (surface subdivision, polygonal modelling, metaballs, etc.).
R11	To digitally design complex materials (displacement mapping, alpha channels, shaders, etc.) and apply them to inorganic three-dimensional objects.
R12	To develop, using digital tools (camera and lighting), the three-dimensional scene according to the basic principles of photography.
R13	To render (make digital captures of three-dimensional scenes) inorganic three-dimensional objects and scenes, adjusting the export parameters according to the requirements of the project.
R14	To prepare the three-dimensional models created, to be included in other editing and/or video game development programs.

R15   To design simple materials (colour, reflection, transparency, etc.) and apply them to organic objects.

R16   To use the specific vocabulary shown in the subject and demonstrate it in a written test.

R17   To develop, using digital tools (camera and lighting), the three-dimensional scene and adjust its parameters on the basis of the aesthetic purpose of the project.

Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are (please score from 1 to 4, being 4 the highest score):

BASIC		Weighting			
		1	2	3	4
B2	Students to apply their knowledge to their job or vocation in a professional manner and to possess competences that are usually shown through the elaboration and defence of arguments and problem-solving within their area of study.				x

GENERAL		Weighting			
		1	2	3	4
G1	To develop original and innovative ideas and proposals in the area of design and narrative of animation and videogames in the required work in a project, combining conceptual and technical aspects.				x
G2	To collaborate in teams that adopt interdisciplinary roles in the elaboration of animation and videogames projects.	x			
G3	To identify new trends in the field of animation and videogames and to incorporate them in their work.	x			
G5	To use a specific and inclusive vocabulary in the area of expertise of the degree.	x			

SPECIFIC		Weighting			
		1	2	3	4
E12	To develop (to sculp, texturize, light up, render and/or animate) organic components of the 3D scene.	x			
E13	To develop (to sculp, texturize, light up, render and/or animate) inorganic components of the 3D scene.	x			
E19	To prepare resources analytically in two and three dimensions susceptible to be included in projects of animation and videogames.	x			

Assessment system for the acquisition of competencies and grading system

Assessed learning outcomes	Granted percentage	Assessment method
	10,00%	Written tests
	30,00%	Practical tests
	60,00%	Elaboration of projects

Observations

Attendance and participation computes 10% in the project development section.

MENTION OF DISTINCTION:
According to Article 22 of the Regulations governing the Evaluation and Qualification of UCV Courses, the mention of "Distinction of Honor" may be awarded by the professor responsible for the course to students who have obtained, at least, the qualification of 9 over 10 ("Sobresaliente"). The number of "Distinction of Honor" mentions that may be awarded may not exceed five percent of the number of students included in the same official record, unless this number is lower than 20, in which case only one "Distinction of Honor" may be awarded.

Learning activities

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:

M2	Participatory master class
M4	Problem solving activities
M6	Project-based learning

IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Active listening, summaries, concept maps and/or notes organizing the information and work in small groups (Kagan structures) to process the received information. M2, M4	R1, R2, R3, R4, R5, R6, R7, R8, R9, R12, R13, R14, R15, R16, R17	10,00	0,40
The student, individually or in a group, leads their action to the elaboration of a tangible final result (product) in which process knowledges and needed competences are incorporated. M4, M6	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17	50,00	2,00
TOTAL		**60,00**	**2,40**

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Autonomous work. Study, memorization, test preparation, practical abilities drilling, elaboration of works, essays, reflections, metacognitions, portfolios elaboration, … M4, M6	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17	30,00	1,20
The student, individually or in a group, leads their action to the elaboration of a tangible final result (product) in which process knowledges and needed competences are incorporated. M4, M6	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17	60,00	2,40
TOTAL		**90,00**	**3,60**

Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
1. Introduction to 3D design.	History of 3D design. Basic fundamentals of creating in 3D.
2. Description of the three-dimensional concept: XYZ coordinate systems, projections and depth.	Basic principles of the three-dimensional environment. Concept of axes, coordinate systems. What does it mean to work in 3D.
3. Phases and components of the creative process in three dimensions.	Description of the creative process in three dimensions: Modeling / texturing / lighting / camera / scene composition / rendering / digital retouching. 3D Work philosophy.
4. Introduction to Cinema 4D. Windows, panels and preferences.	What is Cinema 4D. History, work philosophy, main windows and panels. Work environment.
5. Object modeling using primitives.	Types of modeling in Cinema 4D. What are primitives: advantages and disadvantages. Moving, scaling and rotating objects. Grouping and visibility.
6. Modeling objects using Nurbs.	What is a Nurb. Nurbs typology. What is a spline and types. How to combine splines and Nurbs.
7. Composición de la escena: cámaras y luces.	Types of lighting in Cinema. Use and philosophy of the camera object. Scene composition following the photographic concept.
8. Creation and application of materials: basic, image-based and shaders.	What are materials and how to apply them. New and library materials. Definition of the different channels involved in a material. Classic or nodal materials.
9. Import of external objects.	Export and import formats in the 3D environment. Relationship of cinema 4D with Adobe Illustrator.

10. Advanced modeling using surface subdivision and Boolean.	Polygonal modeling: what it is based on and how it works. Basic functions of polygonal modeling. What is surface subdivision modeling and its relation to polygonal modeling.
11. Photorealistic lighting based on GI and HDR.	What is a render engine. History and evolution. Difference between standard render engines, Physical and Global Illumination. Philosophy of rendering with Global Illumination. Settings and parameters.
12. Rendering typology and parameters.	Parameters and settings in the rendering process. Size, resolution, alpha channels and post effects.
13. Preparation of the three-dimensional model for its printed or digital output: formats, resolution and proportions.	Definition of the type of rendering output required. Size, resolution and parameters.

Temporary organization of learning:

Block of content	Number of sessions	Hours
1. Introduction to 3D design.	1,00	2,00
2. Description of the three-dimensional concept: XYZ coordinate systems, projections and depth.	1,00	2,00
3. Phases and components of the creative process in three dimensions.	1,00	2,00
4. Introduction to Cinema 4D. Windows, panels and preferences.	3,00	6,00
5. Object modeling using primitives.	3,00	6,00
6. Modeling objects using Nurbs.	3,00	6,00
7. Composición de la escena: cámaras y luces.	3,00	6,00
8. Creation and application of materials: basic, image-based and shaders.	2,00	4,00
9. Import of external objects.	2,00	4,00
10. Advanced modeling using surface subdivision and Boolean.	4,00	8,00
11. Photorealistic lighting based on GI and HDR.	3,00	6,00
12. Rendering typology and parameters.	3,00	6,00
13. Preparation of the three-dimensional model for its printed or digital output: formats, resolution and proportions.	1,00	2,00

References

GrayscaleGorilla. From:
https://greyscalegorilla.com/categor/tutorials/

Cineversity. From:
http://www.cineversity.com

HelloLux. From:
http://www.helloluxx.com

EyeDesign. From:
https://eyedesyn.com

The Pixel Lab. From:
https://www.thepixellab.net/tutorials

Simply4D. From:
https://www.youtube.com/channel/UCP6AeFYfJ_jsrNMhvLeNuRw

Cinema 4D Tutorial. From:
https://www.cinema4dtutorial.net

Creative Bloq. From:

https://www.creativebloq.com/how-to/cinema-4d-tutorials-47-projects-to-up-your-3d-skills

Hands on with Maxon. From:
https://www.youtube.com/playlist?list=PLMeO87vDgOoNAIESE1YfgbUmKzxsg_e-9

Los 12 principios de la animación. From:
https://www.notodoanimacion.es/los-12-principios-de-la-animacion-disney-libro/

Addendum to the Course Guide of the Subject

Due to the exceptional situation caused by the health crisis of the COVID-19 and taking into account the security measures related to the development of the educational activity in the Higher Education Institution teaching area, the following changes have been made in the guide of the subject to ensure that Students achieve their learning outcomes of the Subject.

Situation 1: Teaching without limited capacity (when the number of enrolled students is lower than the allowed capacity in classroom, according to the security measures taken).

In this case, no changes are made in the guide of the subject.

Situation 2: Teaching with limited capacity (when the number of enrolled students is higher than the allowed capacity in classroom, according to the security measures taken).

In this case, the following changes are made:

1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject will be made through a simultaneous teaching method combining onsite teaching in the classroom and synchronous online teaching. Students will be able to attend classes onsite or to attend them online through the telematic tools provided by the university (videoconferences). In any case, students who attend classes onsite and who attend them by videoconference will rotate periodically.

In the particular case of this subject, these videoconferences will be made through:

| X | Microsoft Teams |

| | Kaltura |

Situation 3: Confinement due to a new State of Alarm.

In this case, the following changes are made:

1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject, as well as the group and personalized tutoring, will be done with the telematic tools provided by the University, through:

| X | Microsoft Teams |

| | Kaltura |

Explanation about the practical sessions:

2. System for Assessing the Acquisition of the competences and Assessment System

ONSITE WORK

Regarding the Assessment Tools:

| X | The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus. |

| | The following changes will be made to adapt the subject's assessment to the online teaching. |

Course guide		Adaptation	
Assessment tool	Allocated percentage	Description of the suggested changes	Platform to be used

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

Comments to the Assessment System: