Information about the course

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

Faculty: Faculty of Legal, Economic and Social Sciences

Code: 2050213 **Name:** 3D modelling and representation II

Credits: 6,00 ECTS **Year:** 2 **Semester:** 1

Module: MODELADO Y ANIMACIÓN EN TRES DIMENSIONES.

Subject Matter: MODELADO EN TRES DIMENSIONES **Type:** Obligatoria

Branch of knowledge:

Department: Multimedia and Digital Arts

Type of learning: Classroom-based learning

Language/-s in which it is given: Spanish

Teachers:

2052A	Adrian Mantilla Pousa **(Profesor responsable)**	adrian.mantilla@ucv.es

Module organization

MODELADO Y ANIMACIÓN EN TRES DIMENSIONES.

Subject Matter	ECTS	Subject	ECTS	Year/semester
MODELADO EN TRES DIMENSIONES	24	3D Digital sculpture and character modelling I	6	2/2
		3D Digital sculpture and character modelling II	6	3/1
		3D modelling and representation I	6	1/2
		3D modelling and representation II	6	2/1
ANIMACIÓN EN TRES DIMENSIONES	18	3D Animation	6	2/2
		3D Character Animation I	6	3/1
		3D Character Animation II	6	3/2

Recommended knowledge

Currently, the digital entertainment industry is characterized by its constant evolution and demand for sophisticated visual content. 3D Modeling and Representation have become essential disciplines for creating immersive experiences within the realm of video games. Acquiring an advanced level of expertise in the 3D modeling framework, along with obtaining the tools and knowledge required to create high-quality three-dimensional models, will provide students with the keys to competitiveness in the job market.
Throughout this course, advanced 3D modeling concepts, modeling techniques, and strategies for optimizing 3D assets for real-time implementation in video games will be explored.
Recommended prerequisites for enrolling in this course include:

1.(Recommended) Having successfully completed and passed the course "3D Modeling and Representation I."
2.Proficiency in vector software and image editing software.
3.Knowledge in the field of pictorial discourse.
4.Familiarity with level design principles and scenography in video games, including the composition of playable and aesthetically appealing environments.
5.Understanding of current trends in game design and the video game industry as a whole.

These recommended skills and knowledge will provide students with a solid foundation for tackling the advanced concepts and challenges that will be explored in the course "3D Modeling and Representation II." While not strict prerequisites, having prior knowledge in these areas will enable students to fully leverage the course and advance in their development as professionals in 3D content creation for video games.

Other types of requirements

- Es recomendable para cursar la asignatura Modelado y representación en 3D II haber superado la asignatura Modelado y representación en 3D I.
- Es recomendable para cursar la asignatura Modelado de personajes y esculpido digital en 3D I haber superado las asignaturas Modelado y representación en 3D I y Modelado y representación en 3D II.
- Es recomendable para cursar la asignatura Modelado de personajes y esculpido digital en 3D II haber superado la asignatura Modelado de personajes y esculpido digital en 3D I.

Learning outcomes

At the end of the course, the student must demonstrate having acquired the following learning outcomes:

R10 - Digitally model complex inorganic three-dimensional objects using specific techniques (surface subdivision, polygonal modelling, metaballs, etc.). RA12.36

Learning outcomes of the specified title

Type of AR: Habilidades o Destrezas

- Illustrate and generate specific animation and video game projects using traditional procedures and digital techniques

Type of AR: Competencias

- Be able to convey information, ideas, problems, and solutions to both specialized and non-specialized audiences.
- Collaborate in teams that adopt interdisciplinary roles in the development of animation and video game projects.
- Correctly apply their knowledge to their work or vocation in a professional manner and be able to develop and defend arguments and solve problems within their area of study.
- Develop original and innovative ideas and proposals in the area of animation and video game design and storytelling, in the work required for a project, combining conceptual and technical aspects.
- Develop theoretical and practical responses based on the sincere search for the full truth and the integration of all dimensions of the human being in response to life's major questions.
- Respect and implement the ethical principles and action proposals derived from the Sustainable Development Goals, applying them to all academic and professional activities.

R11 - Digitally design complex materials (displacement maps, alpha channels, shaders, etc.) and apply them to inorganic three-dimensional objects. RA12.37

Learning outcomes of the specified title

Type of AR: Competencias

- Be able to convey information, ideas, problems, and solutions to both specialized and non-specialized audiences.

- Collaborate in teams that adopt interdisciplinary roles in the development of animation and video game projects.

- Correctly apply their knowledge to their work or vocation in a professional manner and be able to develop and defend arguments and solve problems within their area of study.

- Develop original and innovative ideas and proposals in the area of animation and video game design and storytelling, in the work required for a project, combining conceptual and technical aspects.

- Develop theoretical and practical responses based on the sincere search for the full truth and the integration of all dimensions of the human being in response to life's major questions.

- Respect and implement the ethical principles and action proposals derived from the Sustainable Development Goals, applying them to all academic and professional activities.

R12 - Develop, using digital tools (camera and lighting), the three-dimensional scene according to the basic principles of photography. RA12.38

Learning outcomes of the specified title

Type of AR: Habilidades o Destrezas

- Illustrate and generate specific animation and video game projects using traditional procedures and digital techniques

Type of AR: Competencias

- Collaborate in teams that adopt interdisciplinary roles in the development of animation and video game projects.

- Correctly apply their knowledge to their work or vocation in a professional manner and be able to develop and defend arguments and solve problems within their area of study.

- Develop original and innovative ideas and proposals in the area of animation and video game design and storytelling, in the work required for a project, combining conceptual and technical aspects.

R13 - Render (take digital captures of three-dimensional scenes) inorganic three-dimensional objects and scenes, adjusting the export parameters based on the project requirements. RA12.39

Learning outcomes of the specified title

Type of AR: Habilidades o Destrezas

- Illustrate and generate specific animation and video game projects using traditional procedures and digital techniques

Type of AR: Competencias

- Collaborate in teams that adopt interdisciplinary roles in the development of animation and video game projects.

- Develop original and innovative ideas and proposals in the area of animation and video game design and storytelling, in the work required for a project, combining conceptual and technical aspects.

- Respect and implement the ethical principles and action proposals derived from the Sustainable Development Goals, applying them to all academic and professional activities.

R14 - Prepare the created three-dimensional models for inclusion in other editing and/or video game development programmes. RA12.40

Learning outcomes of the specified title

Type of AR: Habilidades o Destrezas

- Illustrate and generate specific animation and video game projects using traditional procedures and digital techniques

Type of AR: Competencias

- Collaborate in teams that adopt interdisciplinary roles in the development of animation and video game projects.

- Develop original and innovative ideas and proposals in the area of animation and video game design and storytelling, in the work required for a project, combining conceptual and technical aspects.

R16 - Use specific vocabulary related to three-dimensional digital sculpting and demonstrate this in a written test. RA4.9

Learning outcomes of the specified title

Type of AR: Competencias

- Be able to convey information, ideas, problems, and solutions to both specialized and non-specialized audiences.

- Correctly apply their knowledge to their work or vocation in a professional manner and be able to develop and defend arguments and solve problems within their area of study.

- Develop original and innovative ideas and proposals in the area of animation and video game design and storytelling, in the work required for a project, combining conceptual and technical aspects.

- Develop theoretical and practical responses based on the sincere search for the full truth and the integration of all dimensions of the human being in response to life's major questions.

R8 - Apply new trends in the field of three-dimensional modelling, incorporating them into your projects. RA9.16

Learning outcomes of the specified title

Type of AR: Competencias

- Be able to convey information, ideas, problems, and solutions to both specialized and non-specialized audiences.

- Correctly apply their knowledge to their work or vocation in a professional manner and be able to develop and defend arguments and solve problems within their area of study.

- Develop original and innovative ideas and proposals in the area of animation and video game design and storytelling, in the work required for a project, combining conceptual and technical aspects.

- Develop theoretical and practical responses based on the sincere search for the full truth and the integration of all dimensions of the human being in response to life's major questions.

- Respect and implement the ethical principles and action proposals derived from the Sustainable Development Goals, applying them to all academic and professional activities.

Assessment system

In-person modality

Assessed learning outcomes	Granted percentage	Assessment tool
	20,00%	SE1 – Written exams.
	50,00%	SE6 – Practical exams.
	30,00%	SE8 – Project development.

Observations

1.Submission of all practical and written test assignments is mandatory in order to carry out the final project of the course.

2.An oral defense of each project (when required by the professor) is mandatory for the project to be evaluated. The oral defense is considered part of each project, as it serves to assess the use of discipline-specific vocabulary.

3.Single evaluation is not permitted, given the daily tutoring and in-class work required in this subject.

4.All assignments must be submitted through the designated tasks in the course's virtual campus .

5.In cases where files exceed the platform's upload limit, students are required to submit via their institutional UCV OneDrive account, keeping the files available at least until the end of the current academic year. The professor may reject any submission that does not follow these instructions or fails to meet the established deadlines.

6.All files must be delivered in the formats specified by the professor (e.g., .mb, .ma, .fbx, .png, .pdf…), uncompressed unless expressly indicated. Failure to comply with this requirement may result in the work not being graded.

7.It is the sole responsibility of the student to ensure that files are correctly uploaded and accessible. Claims regarding corrupted, incomplete, or expired links will not be accepted

afterwards.

8.Late submissions will not be accepted unless a justified and documented reason is provided. The professor may apply a grade penalty or directly reject the submission, depending on the case.

9.In addition to attendance, active participation in class is expected. Repeated lack of engagement may negatively affect the qualitative assessment of the student's performance.

10.Any evidence of plagiarism, copying, or unauthorized use of others' work will automatically result in a failing grade for the corresponding activity, and the provisions of the UCV Academic Integrity Regulations will apply.

11.The use of Artificial Intelligence in the creation of 3D models (obj, fbx, or others) is strictly prohibited. Except for specific uses that are documented and expressly authorized by the professor, the use of AI-based image generators is forbidden.

MENTION OF DISTINCTION:

The mention of "Honors" may be awarded to students who have obtained a grade equal to or greater than 9.0. Their number may not exceed five percent of the students enrolled in a group in the corresponding academic year, unless the number of students enrolled is lower.

Training activities

The methodologies to be used so that the students reach the expected learning outcomes will be the following:

M2 MD2: Interactive lecture

M6 MD6: Project-based learning

IN-CLASS TRAINING ACTIVITIES

ACTVITY	RELATIONSHIP WITH THE COURSE LEARNING OUTCOMES	METHODOLOGY	HOURS	ECTS
AF2 – Active listening, elaboration and formulation of questions, summaries, concept maps and/or notes that organize the information received, and related work.	R8, R10, R11, R12, R13, R14	MD2: Interactive lecture	9,00	0,36

AF6 – The student, individually or collectively, focuses on producing a tangible final result (product) that incorporates the knowledge and skills necessary for its realization.	R8, R10, R11, R12, R13, R14	MD2: Interactive lecture	51,00	2,04
TOTAL			**60,00**	**2,40**

TRAINING ACTIVITIES OF AUTONOMOUS WORK

ACTVITY	RELATIONSHIP WITH THE COURSE LEARNING OUTCOMES	METHODOLOGY	HOURS	ECTS
AF8 – Independent work. Study, memorization, exam preparation, practice of practical skills, preparation of assignments, essays, reflections, metacognitive activities, portfolio development, etc.	R8, R10, R11, R12, R13, R14	MD6: Project-based learning	15,00	0,60
AF6 – The student, individually or collectively, focuses on producing a tangible final result (product) that incorporates the knowledge and skills necessary for its realization.	R8, R10, R11, R12, R13, R14	MD6: Project-based learning	75,00	3,00
TOTAL			**90,00**	**3,60**

Description of contents

Description of content necessary for the acquisition of learning outcomes.

Theoretical content:

Block of content	Contents
Module 1. Materials and Texturing in 3D Environments	This module introduces the principles of creating and applying materials within 3D software. It explores the physical and visual properties of surfaces (color, roughness, reflectivity, transparency, emissivity, etc.), as well as the use of texture maps (color, normal, bump, roughness) to enhance the realism of 3D models. The PBR (Physically Based Rendering) workflow is also introduced, ensuring consistent results across different rendering engines and game engines. **Objective**: for students to be able to design and apply suitable materials while understanding their influence on the final appearance of 3D models.
Module 2. Lighting and Rendering in 3D	This module focuses on the fundamentals and techniques of lighting, exploring the simulation of light sources, their behavior in three-dimensional environments, and their impact on visual storytelling. Different lighting setups will be studied (three-point, dramatic, natural, HDRI), along with camera configuration and rendering parameters for producing high-quality final images. Concepts of render optimization and the distinction between real-time and physically based rendering engines will also be introduced. **Objective**: for students to develop the skills to create coherent visual atmospheres and to communicate artistic intentions through lighting and rendering.

Temporary organization of learning:

Block of content	Sessions	Hours
Module 1. Materials and Texturing in 3D Environments	15	30,00
Module 2. Lighting and Rendering in 3D	15	30,00

References

Autodesk Maya 2023 Basics Guide - 1630575275 - SDC Publications

Autodesk Maya - An Introduction to 3D Modeling - 1983263427

Maya Studio Projects: Game Environments and Props (English Edition) - 978-0470524039 - Sybex

Digital Lighting and Rendering (Voices That Matter) (English Edition) - 978-0321928986 - New Riders