Course guide
804225 - M3D - 3D Modelling

Last modified: 16/07/2025

Unit in charge: Image Processing and Multimedia Technology Centre
Teaching unit: 804 - CITM - Image Processing and Multimedia Technology Centre.

Degree: BACHELOR'S DEGREE IN VIDEO GAME DESIGN AND DEVELOPMENT (Syllabus 2014). (Compulsory subject).

Academic year: 2025 **ECTS Credits:** 6.0 **Languages:** Catalan, English

LECTURER

Coordinating lecturer: Pau Sánchez

Others: Pau Sánchez
Josep Serrano

TEACHING METHODOLOGY

The subject is eminently practical. As a consequence, the proposed methodology, with the exception of the first class, which will be purely introductory, will have the following structure:
The initial twenty minutes will be used for the clarification and resolution of doubts regarding the exercise proposed in the previous class.
The following eighty minutes will proceed to a masterful explanation of the new topic and / or procedure to work on.
The last twenty minutes will be used for the presentation and proposal of the next exercise to be carried out, which will be directly linked to the previous master class.

LEARNING OBJECTIVES OF THE SUBJECT

- To identify the graphic representation techniques applied to the design and development of video games.

- To use computer-aided design and illustration applications for the implementation of graphic representation techniques.

- To apply concepts related to the flat and three-dimensional representation and the control of the visualization of objects and scenes.

- To correctly interpret plans of spaces, installations and objects in the context of the design and development of video games.

- To represent complex concepts, ideas and/or data in a schematic and visual way, with the aim of transmitting attractiveness, originality and creativity.

STUDY LOAD

Type	Hours	Percentage
Hours large group	24,0	16.00
Hours medium group	16,0	10.67
Self study	90,0	60.00
Guided activities	20,0	13.33

Total learning time: 150 h

CONTENTS

1. Introduction

Description:
Basic concepts of three-dimensional space
Coordinate systems
Program interface
Customization and menus
Navigation.
Modeling process: creation and manipulation of objects.
Finishing and output processes: materials, lights, cameras and renderings

Related activities:
Non-evaluable activity: independently investigate the operation of the 3D modeling program

Full-or-part-time: 4h
Theory classes: 2h
Self study : 2h

2. Poly modelling

Description:
Polygonal modeling tools
Subobjects
Selection tools
Loops and rings
Copy / Instance / Reference
Creating simple objects from primitives
Polycount
History
Work organization techniques
Template generation
Complex shapes from 2D shapes
Parametric modifiers
Advanced polygonal modeling tools
Free modifiers
Work at Lowpoly
Compound objects
Modeled from composite objects

Related activities:
Design and creation of usual objects from 2D shapes
Design and creation of industrial and furniture elements created from primitives

Full-or-part-time: 33h
Theory classes: 6h
Guided activities: 9h
Self study : 18h

4. Character modelling

Description:
Character modeling
References
Most common errors: T-shapes, non mainfold geometry, nGons.
Modeling with simple primitives
Modeling of a bust
Hair modeling, Hi poly and Low poly techniques
Modeling based on subdivision surfaces
Poly to poly modeling
Anatomy of a figurative human body
body, limbs and hands
Modeling of a mimetic human body
Modeling paradigm shift
Digital sculpture programs and / or tools: Maya, Mudbox and zBrush
Preparation of geometry
Molding brushes
HiPoly vs LowPoly
Polygonal reduction
Processes and tools of retopology
Reduction levels.
Retopology.
Other retopology programs.
Normal maps: extraction and application
Displacement maps

Related activities:
Modeling of simple shapes: fruits, simple insects, claws
Modeling a doll or any trinket
Modeling a head
Modeling a mimetic human body.

Full-or-part-time: 55h
Theory classes: 6h
Guided activities: 9h
Self study : 40h

5. Materials

Description:
The materials editor
Shading trees
Differences between maps and textures
Procedural textures
Multimaterials

Related activities:
Textured from a polygonal exercise done above.

Full-or-part-time: 11h
Theory classes: 2h
Guided activities: 5h
Self study : 4h

6. UV Unwrapping

Description:
UV theory
Advanced unwrap
Deployed UVs
UV packaging
UV sets.
Unforld and relax
Exporting UVs to Photoshop
Painted textures in Photoshop
Occlusion maps

Related activities:
Mapping of a previous organic modeling exercise

Full-or-part-time: 17h
Theory classes: 2h
Guided activities: 5h
Self study : 10h

7. Lighting

Description:
Types of lights
Basic lighting models Outdoor lighting
Generation and typology of shadows

Related activities:
Creation and subsequent lighting of a composition from the elements previously mapped.

Full-or-part-time: 13h
Theory classes: 2h
Guided activities: 5h
Self study : 6h

8. Scene visualization

Description:
Camera types and settings
Differences from real cameras
Render engines: common and uncommon parameters
Adding effects
Render reflections and refractions
Render by channels
Output formats: sequence of still images and / or video

Related activities:
Addition of at least two cameras with different views and also different settings from the previous scene. Obtaining three renderings of different qualities with an explanation of how they were obtained.

Full-or-part-time: 17h
Theory classes: 2h
Guided activities: 5h
Self study : 10h

ACTIVITIES

Partial exam

Description:
Score exam 20%
Part A: Modeling an industrial element according to different techniques. From primitive forms and from two-dimensional forms.
Part B: Test

Full-or-part-time: 4h
Self study: 4h

Final exam

Description:
Exam score 30%
Part A: Modeling in an organic body from a model.
Part B: Test

Full-or-part-time: 4h
Self study: 4h

GRADING SYSTEM

Practices:
Polygonal modeling practices: 10% of the final grade.
Organic modeling practices: 15% of the final grade.
Practices of the materials and maps: 7.5% of the final grade.
Lighting and visualization practices: 7.5% of the final grade.
Student attitude and participation: 10% of the final grade
Partial exam: 20% of the final grade.
Final exam: 30% weight on the final grade.

Students who fail will have the chance to take the reevaluation exam. The mark of this exam will replace the mark of the partial and final exams and, in case of passing the course, the maximum final mark will be a 5.

Irregular actions that may lead to a significant variation of the grade of one or more students constitute a fraudulent performance of an evaluation act. This action entails the descriptive grade of failure and a numerical grade of 0 for the ordinary global evaluation of the course, without the right to re-evaluation.

If the lecturers have indications of the use of AI tools not allowed in the evaluation tests, they can summon the students concerned to an oral test or a meeting to verify the authorship.

EXAMINATION RULES.

The practices will be carried out individually outside the classroom.
In a generic way, they will always use the first thirty minutes of each class to solve any doubts that may exist in the exercises.
All the practices will be delivered in the corresponding folder of the campus in the established term. Failure to deliver a practice or part of it will mean the loss of its value in the final grade.

BIBLIOGRAPHY

Complementary:
- 3DTotal Ltd. . Modeling Human Anatomy. 3dTotal.com,
- Birn, J. Iluminación y render. 2017. Anaya Multimedia, ISBN 9788441520912.
- Lurino, Luciano. 3D Environment Lighting . 3dTotal.com,

RESOURCES

Other resources:
Digital Texturing and Painting
Owen Demers

Digital Lighting and Rendering
Jeremy Birn
Available in Spanish by Anaya

Creating the Art of the Game
Matthew Omernick

3D Game Textures: Create Professional Game Art Using Photoshop
Luke Ahearn

Photoshop for 3D Artists: Volume 1: Enhance Your 3D Renders!
Andrzej Sykut, Fabio M. Ragonha, Zoltan Korcsok, Richard Tilbury, 3DTotal Team (Editor)

Commercial video tutorials:
www.thegnomonworkshop.com
www.digitaltutors.com
www.lynda.com

http://area.autodesk.com />
www.cgchannel.com
Comunitat d'artistes digitals. It complies with debates on programs and with the possibility of accessing various resources, tutorials and online workshops.

www.cgpersia.com
Web and resource forum and tutorials d'aprenentatge of the latest versions of programs. Molts dels seus resources are structured and ordered by marques and commercial programs.

www.3dpoder.com
Resources and tutorials destined to l'aprenentatge of the virtual representation in three dimensions.

www.foro3d.com
Forum of resolution of dubtes and debate of 3dpoder.com