Course guide
804325 - M3D-A - 3D Modelling

Last modified: 18/05/2026

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

Degree: **Academic year:** 2026 **ECTS Credits:** 6.0
Languages: Spanish

LECTURER

Coordinating lecturer: Pulpón Alcolea, Carlos

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CEAAD 4. Have a command of the basics of lighting, photography and digital treatment to design and carry out artistic, audiovisual and animation products.
CEAAD 3. Master the wide range of professional tools in the sector for developing all kinds of digital content.
CEAAD 6. Design, model, texturise and animate 2D and 3D objects, characters and scenes for inclusion in digital projects, audiovisual sequences and video games.

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.
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.

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

· Understand the concepts of three-dimensional modeling and their relationship with the different areas of design and artistic disciplines.
· Know the most used professional 3d design tools at a professional level.
· Learn to identify good practices when working.
· Know the specific techniques of creating digital volumes.
· Learn the basics of modeling, texturing and 3d lighting.
· Introduce work with digital sculpture.
· Use the content of the subject to create professional quality models.
· Adapt the application of 2D design and illustration concepts in the creation of textures for 3d models.
· Apply textures on a three-dimensional model following the most common techniques.
· Carry out the exercises proposed in the subject applying a correct structure, presentation and time planning, accompanied by a good orthographic and grammatical level.

STUDY LOAD

Type	Hours	Percentage
Hours large group	24,0	16.00
Hours medium group	22,0	14.67
Guided activities	14,0	9.33
Self study	90,0	60.00

Total learning time: 150 h

CONTENTS

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

Specific objectives:
Know the basic concepts of any three-dimensional space.
Know the interface of the 3Ds MAX program

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

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

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

Specific objectives:
Demonstrate knowledge and know how to apply concepts related to flat and three-dimensional representation and the control of the visualization of objects and scenes, using computer programs for graphic representation.

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: 30h
Theory classes: 6h
Guided activities: 6h
Self study : 18h

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
3dsMAX digital sculpture tools
Modeling paradigm shift
Other 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 has since 3dsMAX.
Other retopology programs.
Normal maps: extraction and application
Displacement maps

Specific objectives:
Know the basic concepts of geometry to generate bodies and surfaces, and know how to apply them in the modeling of 3D objects and scenes

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: 56h
Theory classes: 6h
Guided activities: 6h
Self study : 44h

Materials

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

Specific objectives:
Know how to use different three-dimensional modeling and texturing techniques, taking into account the characteristics or type of application for which the 3D model is being generated.

Related activities:
Textured from a polygonal exercise done above.

Full-or-part-time: 8h
Theory classes: 2h
Guided activities: 2h
Self study : 4h

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

Specific objectives:
Know how to use different three-dimensional modeling and texturing techniques, taking into account the characteristics or type of application for which the 3D model is being generated.

Related activities:
Mapping of a previous organic modeling exercise

Full-or-part-time: 14h
Theory classes: 2h
Guided activities: 2h
Self study : 10h

Lighting

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

Specific objectives:
Know how to use different lighting techniques, taking into account the characteristics or type of application for which the 3D model is being generated.

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

Full-or-part-time: 10h
Theory classes: 2h
Guided activities: 2h
Self study : 6h

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

Specific objectives:
Know how to plan the most appropriate workflow in the different rendering phases, as well as know the most appropriate rendering parameters for a given 3D design.

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: 14h
Theory classes: 2h
Guided activities: 2h
Self study : 10h

ACTIVITIES

Partial exam

Description:
Score exam 15%
Modeling an industrial element according to different techniques. From primitive forms and from two-dimensional forms.

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

Final exam

Description:
Exam score 20%
Part A: Modeling in an organic body from a model.
Part B: Test

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

GRADING SYSTEM

Any academic fraud, plagiarism or use or possession of unauthorised means in an assessment activity leads to a mark of zero (0) for the affected test or assignment. Furthermore, in accordance with the University's regulations, if disciplinary proceedings are initiated the subject is recorded as "Pending Assessment" until a decision is reached. These incidents are managed in accordance with the **Action Framework for Academic Integrity in Assessment at the UPC**.

Practices:
The three polygonal modeling practices: 25% of the final grade.
The two organic modeling practices: 30% of the final grade.
Student attitude, participation and correct delivery of all the courses practice: 10% of the final grade
Partial exam: 15% of the final grade.
Final exam: 20% weight on the final grade.
Students who do not pass the subject through continuous assessment may take the reevaluation exam, as long as they do not have an NP grade.
The grade obtained in this reevaluation exam may in no case be higher than a 5, a fair pass.

EXAMINATION RULES.

The practices will be carried out individually.
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

Basic:
- Ascent, Co.. Autodesk 3ds Max 2021 Fundamentals. ISBN 978-1-63057-352-2.
- Murdock, Kelly L.. Autodesk 3ds Max 2021 Complete Reference Guide. ISBN 978-1-63057-334-8.

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

RESOURCES

Hyperlink:
- www.cgchannel.com. Comunidad de artistas digitales. Cuenta con debates acerca de programas así como con la posibilidad de acceder a diversos recursos, tutoriales y workshops online.
- www.cgpersia.com. Web y foro de recursos y tutoriales de aprendizaje de las últimas versiones de programas. Muchos de sus recursos están estructurados y ordenados por marcas y programas comerciales.
- www.3dpoder.com. Recursos y tutoriales destinados al aprendizaje de la representación virtual en tres dimensiones.
- www.foro3d.com. Foro de resolución de dudas y debate de 3dpoder.com