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**COURSE GUIDE**  
**3D Modelling and Animation**  
**Master's Degree in Digital Media**  
**Catholic University of Valencia**

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**Course 2020 / 21**



## TEACHING GUIDE OF THE SUBJECT

		ECTS
<b>SUBJECT:</b> 3D Modelling and Animation		6
<b>Subject-Matter:</b> 3D Modelling and Animation		6
<b>Module:</b> Digital video		18
<b>Type of learning:</b> Mandatory	<b>COURSE:</b> 1 <b>SEMESTER:</b> 2º	
<b>Teacher:</b> José María Lajara Romance	<b>Department:</b> Multimedia	
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## MODULE ORGANIZATION

Digital Video		18		
<b>Duration and temporal location within the curriculum:</b>				
<b>Subjects and Courses</b>				
SUBJECT	ECTS	COURSES	ECTS	Course/ semester
Capture and edit video and digital audio	6	Capture and edit video and digital audio	6	1/1
3D Modelling and Animation	6	3D Modelling and Animation	6	1/2
Digital Postproduction	6	Digital Postproduction	6	1/2



## TEACHING GUIDE OF THE SUBJECT: 3D Modelling and Animation

**Prerequisites: Not required**

### GENERAL GOALS

-Understand the fundamental components of design in three dimensions  
 -Master the stages of the creative process in three dimensions  
 Mastering the modeling, lighting and texturing process of 3D scene  
 -Master the techniques of composition in 3D  
 -Mastering the animation process tridimensional  
 -Know output processes of three-dimensional image and its different applications depending on the medium to be targeted by the project.

### BASIC COMPETENCES<sup>1</sup>

#### Weight

	1	2	3	4
CB6 - Knowledge and understanding that provide a basis or opportunity for originality in developing and / or applying ideas, often within a research context.			X	
CB7 - That the students can apply their knowledge and ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study.			X	
CB8 - Students should be able to integrate knowledge and handle complexity, and formulate judgments based on information that was incomplete or limited, include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgments.		X		
CB9 - That students can communicate their conclusions what the knowledge and rationale underpinning these,? For specialists and non-specialists in a clear and unambiguous.			X	
CB10 - Students must possess the learning skills to enable them to continue studying in a way that will be largely self-directed or autonomous.				X

<sup>1</sup> List of all the competences. Each of them must be weighed up from 1 to 4, using as a criterion the contribution of the subject to the final development of the competence.



<b>GENERAL COMPETENCES <sup>2</sup></b>				
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
CG01 - Working in an interdisciplinary team.			X	
CG02 - Working in an international context.			X	
CG03 - Interpersonal relationship skills			X	
CG04 - Creativity. Ability to generate new ideas.				X
CG05 - Ability to collaborate with other professions, and especially with professionals from other fields. Identify the right professionals to develop creative work properly.				X
CG06 - Initiative and entrepreneurship.			X	
CG07 - Motivation for quality.			X	
CG08 - Capacity for self-employment and job creation.			X	

<b>CROSS-SECTIONAL COMPETENCES<sup>3</sup></b>				
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
CT01 - Behave ethically in carrying out their responsibilities to the profession and society.				X
CT02 - Knowing the fundamental laws (international, national and regional) on equal opportunities between women and men.			X	
CT03 - Respect entrances to buildings and classrooms of students with disabilities to contribute in equal opportunities and full integration into the university community.			X	
CT04 - Understanding the relationships between gender and education, training, science and culture, to design coeducational and egalitarian processes of a culture of peace and democratic values.			X	

<sup>3</sup> Follow consecutively with the previous numbering. The specific competences are weighted 1-4 following the same approach as with the cross.



<b>SPECIFIC COMPETENCES<sup>4</sup></b>				
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
E01 - Encouraging creativity and innovation in multimedia environments.				<b>X</b>
E02 - Knowing the specific production methods and especially digital art techniques to apply to the world of communication, also seeking new media.			<b>X</b>	
E03 - Develop technical skills and procedures in traditional illustration and digital techniques for the creation and development of graphics, images, symbols and texts.				
E04 - Organize, sort and index all materials and files used in the development of digital projects, generating documents for proper conservation or query. And the ability for later search and retrieval of information.			<b>X</b>	
E05 - Generate new ideas and aesthetic solutions for the development of new designs in multimedia environments.				
E06 - Analyze areas of information society in which media technologies can be useful and applicable.			<b>X</b>	
E07 - Plan and manage projects and technological developments.				
E08 - Synthesize creative ideas so that it is possible to transmit in digital format.				<b>X</b>
E09 - Properly expose the results of research in oral, written, visual or digital, according to the canons of the disciplines of information and communication.			<b>X</b>	



	1	2	3	4
E10 - Rate the design and composition to create visual messages.				
E11 - Understand and convey the role of strategic communication as a factor of innovation.				
E12 - Analyze the characteristics of the digital production industry and its operation, investigating and detecting needs.			X	
E13 - Understand, value and understand the ethical obligations in the environments of graphic design, digital video and multimedia web-and the need to comply with them.				X
E14 - Develop graphic projects from conception to completion print or electronic on-demand.				
E15 - Create logos and define the company's corporate identity				
E16 - Retouch, manipulate and perform assemblies creative with digital images for further processing or photo inclusion in different media.				
E17 - Direct and layout for print media publications or digital.				
E18 - Check all prepress and printing process of graphic design.				
E19 - Accurately generate pdf documents of different projects for their proper conservation, exchange or query.				



	1	2	3	4
E20 - Capture, scan and edit the video material through nonlinear systems under narrative criteria.				
E21 - Postproducir edited video material, adding effects, animation and titling				
E22 - Convert and adapt audiovisual projects generated at different media and formats, both for broadcast and their conservation.				
E23 - Direct and design three-dimensional animation for the development of industrial headers, presenting programs, advertisements and illustrations explanatory				X
E24 - Conceptualize, plan and design Web pages according to market IT standards.				
E25 - Programming Web projects using appropriate computer languages and current.				
E26 - Host, maintain and update web projects on file servers.				

LEARNING OUTCOMES
R-1 Know the key components of the design in three dimensions
R-2 Master the stages of the creative process in three dimensions
R-3 Master the process of modeling, lighting and texturing of the 3D scene
R-4 Master composition techniques in 3D
R-5 Master 3D animation process
R-6 Know output processes of three-dimensional image and its different applications depending on the medium to be targeted by the project.



EDUCATIONAL ACTIVITIES		
ACTIVITY	Nº Hours	presentiality
<b>On-campus Class:</b> preferably oriented training activity to acquire knowledge acquisition skills. refers to the oral presentation by the teacher, (supported by board, computer and projector for the display of text, graphics, software, etc..), to a group of students. These sessions expository, explanatory and demonstrative content.	20	100%
<b>Computer practice:</b> training activity aimed at acquiring skills through experimentation práctica. Se place in the computer room where it is developed to support learning using the computer. Includes working with specific software, Web queries, handling peripherals, etc.	65	100%
<b>Independent work:</b> Independent work of student activity that represents the time that the student must devote to material preparation.	50	0%
<b>Tutorials:</b> Personal attention or in small groups. Period of instruction and / or guidance by a tutor to review and discuss the materials and topics presented in lectures, seminars, readings, papers, etc..	10	100%
<b>Assessment:</b> Group of oral and / or written used in the initial, formative or additive assessment.	5	100%





<b>EVALUATING SYSTEM</b>		
<b>Evaluating system</b>	<b>minimum weight</b>	<b>Maximun weight</b>
Testing practices computer	0.0	2.0
Oral presentation of group work and individual	0.0	1.0
Individual monitoring of attendance at sessions and active participation	0.0	1.0
Deliverables activities	0.0	10.0

**MENTION OF DISTINCTION:**

The mention of Distinction will be awarded to students who have achieved a score equal to or greater than 9.0. The number of Distinctions granted will not exceed 5% of students enrolled in a subject in the corresponding academic year unless enrollment is under 20, in which case only one Distinction may be granted. (Royal Decree 1125/2003).



<b>DESCRIPTION OF CONTENTS</b>
-History of representation in three dimensions.
- Description of the three-dimensional concept : XYZ coordinate systems , projections and depth.
-Phases and components of the creative process in three dimensions.
-Ways of modelling objects : basic , parametric , NURBS , and Metaballs HyperNURBS
- Creation, modification and application of materials
- Import of external objects.
Lighting and composition of the scene: lights, cameras and scenarios.
- Type of rendering and parameters.
-Preparation of three-dimensional model for print or digital output formats , resolution and proportions.
-Fundamentals of traditional animation from Disney to 3D .
-Timeline and components.
-Definition, implementation and modification of keyframes.
-Basic animation by translation, scaling and rotation.
- Animating parameters and attributes.
- Concept of acceleration and braking : “F” curves
-Deformers and particle systems. Applying filters and effects.
Preparation animation for output to different media: web , movies, television.
-Animation rendering and postproduction.



<b>TEMPORAL ORGANIZATION OF LEARNING</b>		
	<b>CONTENT/TEACHING UNIT</b>	<b>SESSIONS</b>
<b>1</b>	- Description of the three-dimensional concept : XYZ coordinate systems , projections and depth.	<b>0,5</b>
<b>2</b>	-Phases and components of the creative process in three dimensions.	<b>0,5</b>
<b>3</b>	Introduction to Cinema 4D. Panels, windows and preferences.	<b>1</b>
<b>4</b>	Modelling objects with primitives	<b>1</b>
<b>5</b>	Modelling objects with Nurbs	<b>2</b>
<b>6</b>	Scene composition: cameras and lights	<b>2</b>
<b>7</b>	Creating and applying materials: basic, based on images and shaders	<b>2</b>
<b>8</b>	Importing external objects	<b>1</b>
<b>9</b>	Advanced modeling by HyperNURBS and Boolean operations	<b>2</b>
<b>10</b>	Photorealistic lighting based on HDR and IG	<b>1</b>
<b>11</b>	Type of rendering and parameters.	<b>1</b>
<b>12</b>	Preparation of three-dimensional model for print or digital output formats, resolution and proportions.	<b>1</b>
<b>13</b>	Fundamentals of traditional animation from Disney to 3D.	<b>0,5</b>
<b>14</b>	Time line and components	<b>0,5</b>
<b>15</b>	Definition, implementation and modification of keyframes.	<b>1</b>
<b>16</b>	Basic animation by translation, scaling and rotation.	<b>2</b>



17	Animation parameters and attributes.	1
18	Concept of acceleration and braking: "F" curves.	1
19	Deformers and particle systems. Applying filters and effects.	2
20	Preparation animation for output to different media: web, movies, television.	1
21	Animation rendering and postproduction	1

The sessions are four hours in duration.

## BIBLIOGRAPHY

### Books

Cinema 4D. Tehe Artist's Project Sourcebook  
Anne Powers  
Digital Media Academy

Cinema 4D 11  
Arndt von Koenigsmarck  
Anaya Multimedia

### Web

<http://greyscalegorilla.com/blog/>  
<http://www.c4des.com/index.php>  
<http://www.c4dcafe.com/portal/default.asp>  
<http://www.base80.com>  
<http://www.helloluxx.com>  
<http://www.cineversity.com>  
<http://www.digitaltutors.com/11/index.php?>  
<http://circlesofdelusion.blogspot.com.es>  
<http://www.instantshift.com/2010/03/12/90-smoking-cinema-4d-tutorials-and-best-techniques/>



## ADDITIONAL INFORMATION:

### WORK PLANNING FOR SECOND AND FURTHER ENROLLMENTS:

There will be a special group for those students who have not registered for the first time, and a teacher responsible of this group. This teacher has to schedule six two-hour sessions for monitoring and mentoring. In each session the subject will be developed so as to reinforce the work of the skills that each student needs to pass the course. The assessment contained in the examination will be established in the official calendar of this subject. These sessions are available on the specific schedule. The blocks of content and tasks to be performed in each session are as follows:

<b>SECOND AND SUBSEQUENT ENROLLMENTS DIDACTIC UNITS</b>		
	<b>LESSON</b>	<b>NUMBER OF SESSIONS</b>
<b>1</b>	Introduction to Cinema 4D. Panels, windows and preferences.	<b>1</b>
<b>2</b>	Modelling objects with Nurbs	<b>1</b>
<b>3</b>	Scene composition: cameras and lights	<b>1</b>
<b>4</b>	Creating and applying materials: basic, based on images and shaders	<b>1</b>
<b>5</b>	Type of rendering and parameters.	<b>1</b>
<b>6</b>	Basic animation by translation, scaling and rotation.	<b>1</b>