

Curso 2024-25



Istituto Europeo di Design

Centro privado autorizado

GUÍA DOCENTE DE

Digital Technology. 3D Modeling

Título de Grado en
Enseñanzas Artísticas Superiores de Diseño

Especialidad de Diseño de Producto

Fecha de actualización: 1 de septiembre de 2026



Dirección General de Universidades y
Enseñanzas Artísticas Superiores
CONSEJERÍA DE CIENCIA, UNIVERSIDADES
E INNOVACIÓN

Título de Grado en Enseñanzas Artísticas Superiores de Diseño

Subject: Digital Technology. 3D Modeling (Tecnología digital. Modelado 3D)

1. IDENTIFICADORES DE LA ASIGNATURA

Type	OEI-PSD	
Character	Theoretical -practical	
Especialidad	Diseño de Producto	
Materia	MATERIALS AND TECHNOLOGY APPLIED TO PRODUCT DESIGN	
Periodo de impartición	3rd semester	
Número de créditos	4 ECTS	
Número de horas	Totales: 120h	Presenciales: 72h
Número mínimo de alumnos necesario para impartir la asignatura	-	
Departamento	Departamento didáctico, especialidad producto	
Prelación/ requisitos previos	Sin prelación	
Idioma/s en los que se imparte	English	

2. TEACHER IN CHARGE OF THE SUBJECT

Surname & name	E-mail
Fernández Rábano, José Andrés	IED Campus

3. LIST OF LECTURERS AND GROUPS THEY TEACH

Surname & name	E-mail	Groups
Fernández Rábano, José Andrés	IED Campus	All

4. COMPETENCES

Transversal competences
CTD1, Organize and plan work in an efficient and motivating manner.
CTD2, Collect significant information, analyze it, synthesize it and manage it appropriately.
CTD3, Solve problems and make decisions in line with the objectives of the work that is carried out.

CETD4, Use information and communication technologies efficiently

CTD5, Understand and use at least one foreign language in the scope of the professional development

General competences

CGD2, Master the languages and expressive resources of representation and communication.

CGD11, Communicate ideas and projects to clients, provide reasoned arguments, know how to evaluate proposals and channel dialogue.

CGD17, Propose, evaluate and develop appropriate learning strategies to achieve personal and professional objectives.

CGD18, Optimize the use of the resources necessary to achieve the planned objectives.

Specific competences

CEP9, Master the graphic-plastic resources of bi- and three-dimensional representation.

CEP10, Produce and communicate adequate information related to production.

CEP11, Know the technological resources of communication and their applications to product design.

CEP12, Master specific digital technology linked to the development and execution of product design projects.

5. LEARNING ACHIEVEMENTS

- Knowing how to apply digital technology to product design.
- Being able to represent products in two and three dimensions.
- Being familiar with CAD (computer-aided design) software for object modeling, including knowing how to study and technically analyze 3D models.
- Being able to use digital technology for product development and project communication.
- Knowing how to research methods and being able to experiment with subject matter.

6. CONTENTS

Section (if applicable)	Topic/repertoire
I. 3D Modeling	Topic 1. Fundamentals 1.1. Coordinates and construction planes 1.2. C Planes 1.3. Zoom 1.4. Layers, visualization, and properties 1.5. Recent command and History
	Topic 2. Basic Modeling 2.1. Surface creation 2.2. Extrusion operation 2.3. Loft surfaces 2.4. Revolution 2.5. One-rail sweep 2.6. Two-rail sweep
	Topic 3. Curve and Surface Editing 3.1. Editing points and degrees of a curve 3.2. Rebuilding surfaces
	Topic 4. Intersection Between Elements 4.1. Solid creation menu 4.2. Surface menu
	Topic 5. Curve Continuity 5.1. No continuity 5.2. G0 5.3. G1 5.4. G2 5.5. ConG
	Topic 6. Curve and Surface Analysis 6.1. Direction 6.2. Curvature graph 6.3. Visual surface analysis 6.4. Edge evaluation
	Topic 7. Surfaces with Folds. 3D Curves

II. Technical Drawing	Topic 8. Technical Drawing and Dimensioning 8.1. UNI 3968 8.2. UNI 3970 8.3. UNI 3971 8.4. UNI 3973-74-75
	Topic 9. Technical Drawing and Design for Production 9.1. UNI 3973-74-75 9.2. UNI 8411 9.3. Exploded views

7. STUDENTS WORK TIME PLAN/SCHEDULE

Type of activity	Total hours
Theoretical activities	30 hours
Practical activities	16 hours
Other mandatory training activities (conferences, seminars, etc.)	16 hours
Evaluation	10 hours
Student's working hours	12 hours
Internship/work placement preparation	24 hours
Taking test	12 hours
Total student's working hours	120 hours

8. METHODOLOGY

Theoretical activities	The master class is mainly used for the teacher to provide a presentation and explanation of the contents, with the support and use of ICTs. During this presentation period, students may ask questions, any doubts that may arise can be solved, the search for information may be guided, and individual or group debates can take place, etc. During these sessions, the content of the subject is taught by proposing trilateral information inputs (teacher-student-student group), developing them in a tangible way through a series of exercises which are intended to be a part of the practical activities.
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Practical activities	We use a Project-based learning process: situations in which students must explore and work on a practical problem by applying interdisciplinary skills under the teacher's supervision. In this case, skills related to the elements surrounding the design of a product, and the methodology of the design process, in its application to the design of products, services and systems, and the user's interaction with them. In this case, the project includes the development of a model. Project presentation: presentation of the project assigned to a student or group of students.
Other mandatory training activities (conferences, seminars, etc.)	Mandatory training activities for the subject will be organized in specific workshop spaces led by teaching and specialist staff as part of the applied face-to-face practice and with the aim of strengthening the expected skills in technical and scientific detail. These activities will not be graded.

9. EVALUATION AND GRADING CRITERIA AND INSTRUMENTS

9.1. EVALUATION-ASSESSMENT TOOLS

Theoretical activities	Participation will be required in the discussions generated during the theoretical sessions. A final test on the theoretical content of the course will be given.
Practical activities	The development of deliverables (practical problem-solving assignments), to be completed individually, will be proposed in relation to the course content. Specific submission requirements will be defined for each deliverable.
Other mandatory training activities (conferences, seminars, etc.)	These activities will not be assessed, therefore no assessment instruments are described in this regard.

9.2. EVALUATION CRITERIA

Work to be assessed:

1. Knowing how to apply digital technology to product design.
2. Being able to represent products in two and three dimensions.
3. Being familiar with CAD (computer-aided design) software for object modeling, including knowing how to study and technically analyze 3D models.

4. Being able to use digital technology for product development and project communication.
5. Knowing how to research methods and being able to experiment with subject matter.

The evaluation assessment must be designed and planned in a manner that integrates it within the teaching/learning training activities.

The assessment of students learning ought to be continuous, personalized and integrative:

- Continuous: in that it is integrated into the teaching-learning process and consequently is not limited by dates or specific situations.
- Personalised: since it must take into account the capacities, skills and the student's attitude. Special attention will be paid to the student's participation in work groups.
- Integrative: in that it requires taking into account the general capacities established for each stage, this will be done through the objectives in the different units and areas.

Students' learning will be assessed in relation to the achievement of the educational objectives determined in the course curriculum, and associated to the general and specific objectives, taking as an immediate reference the evaluation criteria established for the area.

To assess students learning process we need to:

- Evaluate their curricular competence (abilities and aptitudes).
- Assess the factors that hinder or facilitate good learning.
- Encourage self-evaluation and co-evaluation of students amongst themselves, as a source of critical analysis of their results, to allow for changes in attitude and for their improvement.
- Value the learning context in which the student develops.

Theoretical activities	Participation in the discussions generated during the sessions. Final test on the theoretical content of the course.
Practical activities	Completion and submission by the established deadline of the proposed practical problem-solving exercises related to the course content: • • Evaluation of the completed practice • • Evaluation of the conclusions or submitted work
Other mandatory training activities (conferences, seminars, etc.)	Attendance at these mandatory training activities will be recorded and taken into account for compliance with the minimum attendance required for continuous assessment.

9.3. GRADING CRITERIA

1. The evaluation system to be used in the subject/course is adapted to the continuous evaluation model.

2. In the continuous evaluation system, class attendance is compulsory, and students must comply with a percentage of activity in the presence of the teacher, which is estimated to be 80% (minimum).
3. If the student does not meet the criteria for continuous evaluation, they will hand in a specific task/project to be graded in an evaluation process with a loss of continuous evaluation – this may include any parts deemed necessary, and their corresponding relative weights are shown in the corresponding section of this guide.
4. In any case, the student will take an extraordinary exam, the structure, evaluation instrument and grading criteria for said exam is explained in this guide.
5. In order to opt for the continuous evaluation, each and every practical case proposed by teachers must be handed-in on the required set dates.

9.3.1. Evaluation/Assessment tools for the weighting of grades in the continuous assessment process

Tools	Weighting of grades
Completion, presentation, and handing-in the partial deliverable tasks	20%
Project completion, presentation and handing-in	70%
Taking part in workshops, corrections, debates	10%
Total	100%

9.3.2. Assessment tools for the weighting of grades in the evaluation process following a loss of continuous assessment/evaluation

Reasons why a student may lose the right to continuous assessment: failure to comply with the mandatory class attendance requirement set at 80%.

Tools	Weighting of grades
Project completion, presentation and handing-in	60%
Completing the specific test for the evaluation in case of a loss of continuous evaluation	40%
Total	100%

9.3.3. Assessment tools for the weighting of grades in the extraordinary evaluation process

Tools	Weighting of grades
Completing, presenting and handing-in the courses final project	60%
Taking a specific test for the extraordinary evaluation	40%
Total	100%

9.3.4. Weighting of grades in the evaluation process for students with a disability

When the evaluation tools are adapted for this purpose, all the different types of disability must be taken into account.

Tools	Weighting of grades
These shall be determined taking different types of disability into consideration	
Total	100%

10. TIME PLANNING FOR THE CONTENTS, TEACHING METHODOLOGY AND EVALUATIONS

Session	CONTENTS, CONNECTED TEACHING METHODOLOGY, AND EVALUATION TOOLS		Total hours presence-based	Total hours non-presence-based
Session 1	TOPIC 1: Fundamentals of Rhinoceros 3D			
	Theoretical activities	Master class developing the specific agenda of the section	1 hour	1 hour
	Practical activities	Practical exercise solving	1 hour	2 hours
	Evaluation	Practical work revision	0.5 hours	

Session 2 and 3	TOPIC 2: Surface Creation in Rhinoceros 3D			
	Theoretical activities	Master class developing the specific agenda of the section	2 hours	2 hours
	Practical activities	Practical exercise solving	2 hours	4 hours
	Other learning activities	Design workshop	2 hours	
	Evaluation	Practical work revision	1 hour	

Session 4	TOPIC 2: Initial Modeling			
	Theoretical activities	Master class developing the specific agenda of the section	1 hour	1 hour

	Practical activities	Practical exercise solving	1 hour	2 hours
	Other learning activities	Design workshop	2 hours	
	Evaluation	Practical work revision	0,5 hour	

Session 5	TOPIC 3: Curve and Surface Editing			
	Theoretical activities	Master class developing the specific agenda of the section	1 hour	1 hour
	Practical activities	Practical exercise solving	1 hour	2 hours
	Other learning activities	Design workshop	2 hours	
	Evaluation	Practical work revision.	0,5 hour	

Session 6	TOPIC 4: INTERSECTION OF ELEMENTS			
	Theoretical activities	Master class developing the specific agenda of the section	1 hour	1 hour
	Practical activities	Practical exercise solving	1 hour	2 hours
	Other learning activities	Design workshop	2 hours	
	Evaluation	Practical work revision.	0,5 hours	

Session 7	TOPIC 5: CONTINUITY OF CURVES			
	Theoretical activities	Master class developing the specific agenda of the section	1 hour	1 hour
	Practical activities	Practical exercise solving	1 hour	2 hours

	Other learning activities	Design workshop	2 hours	
	Evaluation	Practical work revision.	0.5 hours	

Session 8	TOPIC 6: ANALYSIS OF CURVES AND SURFACES			
	Theoretical activities	Master class developing the specific agenda of the section	1 hour	1 Hour
	Practical activities	Practical exercise solving	1 hour	2 Hours
	Other learning activities	Design workshop	2 hours	
	Evaluation	Practical work revision.	0,5 hours	

Session 9	TOPIC 7: SURFACES WITH FOLDS. 3D CURVES			
	Theoretical activities	Master class developing the specific agenda of the section	1 Hour	1 Hour
	Practical activities	Practical exercise solving	1 hour	2 Hours
	Other learning activities	Design workshop	4 Hours	
	Evaluation	Practical work revision.	1 Hour	

Session 10	TOPIC 8: TECHNICAL DRAWING AND DIMENSIONING			
	TOPIC 9: TECHNICAL DRAWING AND DESIGN FOR PRODUCTION			
	Theoretical activities	Master class developing the specific agenda of the section	1 Hour	1 Hour
	Practical activities	Practical exercise solving	1 Hour	2 hours
	Other learning activities	Design workshop	4 Hours	

	Evaluation	Practical work revision.	0.5 Hours	
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Session 11	Final Submission and Exam			
	Other learning activities	Design workshop	4 hours	
	Evaluation	Final Individual Test Final Submission of Practical Exercises	2.5 Hours	2 Hours 4 hours

Session 12	HANDING-OUT GRADES AND EVALUATIONS			
	Evaluation	Grade Submission, Review, and Evaluation of Students	2,5 Hours	

11. TEACHING RESOURCES & MATERIALS

Resources and teaching materials available on the virtual campus for each thematic block:

- PDF files
- Explanatory videos
- Screen-capture videos recorded from the teacher's computer during certain sessions

Additionally, specific software will be available on the classroom computers:

- Rhinoceros: project modeling

11.1. General Bibliography

Title	Modelado de Objetos con Rhinoceros 3D
Author	Julián Antonio Ossa Castaño
Publisher	McNeel

Title	Modelado digital (Espacio De Diseño)
Author	William Vaughan
Publisher	Anaya

Title	Dibujo Técnico I
Author	Varios autores
Publisher	Edebé

11.2. Additional Bibliography

Title	Impresión 3D
Author	Sergio Gómez
Publisher	Marcombo

Title	Normalización del dibujo técnico
Author	Francisco Jesús Moral García y Cándido Preciado Barrena
Publisher	A. Donostiarra

11.3. Websites of interest

www.rhino3d.com/es/tutorials

11.4. Other materials and learning resources

Rhinoceros - Modelado del proyecto