



**1. Code:** 32506      **Name:** Advanced Three-Dimensional Sketching Techniques

**2. Credits:** 5,00      **--Lecture:** 2,50      **--Practice:** 2,50      **Type of Course:** Elective

**Degree:** 2160-Master's Degree in Design Engineering

**Module:** 1-Elective subjects Semester A      **Subject:** 1-Research and development in design

**University Center:** SCHOOL OF DESIGN ENGINEERING

**3. Coordinator:** Alcaide Marzal, Jorge  
**Departament:** ENGINEERING PROJECTS

**4. References**

Essential ZBrush	Robson, Wayne
ZBrush digital sculpting human anatomy [electronic resource]	Spencer, Scott   Keller, Eric   Gaboury, Paul
ZBrush Studio Projects : realistic game characters	Kingslien, Ryan
ZBrush professional tips and techniques [electronic resource]	Gaboury, Paul R
Secrets of ZBrush experts [electronic resource] : tips, techniques, and insights for users of all abilities	Wise, Daryl   Anderson, Marina
Introducing ZBrush [electronic resource]	Keller, Eric

**5. Course Outline**

In the initial stages of design, most of the creative process of generating shapes is carried out on paper, dispensing with the use of computers, except for the use of 2D drawing programs. CAD systems are not suitable in these early stages in which everything is intuitive and indefinite, and in which the creation of general shapes is sought rather than precision and working with measurements.

In recent years there has been a strong evolution in digital sculpture programmes. These are software packages aimed at free form modeling, mainly with organic elements and intended for the film industry, video games and illustration. These programs offer absolute modeling freedom, simulating the work the designer does when using clay or foams to define conceptual shapes. Therefore, its use as a conceptual design tool is beginning to become widespread, being applied already in sectors such as automotive or jewelry.

The aim of this course is to introduce the student to the use of one of these programs. The main goal is for you to become proficient in three-dimensional sketching of product proposals. This term refers to the spontaneous, fresh and elemental character of the models it will generate, which brings them much closer to the traditional sketch on paper than to the final design in a CAD system. With these tools, students can unleash their creativity while producing three-dimensional shapes that allow them to explore and show concepts from any angle and with the detail and finish they want, combining the power of computer design with the flexibility and freedom of a paper sketch. Basic notions on the integration of digital sculpture models in the work with production-oriented CAD systems will also be acquired.

The software used in the course will be ZBrush 2019, a benchmark program in the film and video game industry, which is progressively gaining relevance in other sectors such as jewelry design or automotive styling. At present its use in these industries is fully established, and is spreading to many others (toys, footwear, custom products, appliances and digital devices)

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The subject has been taught for some years under the inverse class methodology. Classroom classes are eminently practical and focus on developing the work proposed during the course.

**6. Recommended Prior Knowledge**

It is recommended but not essential to have basic notions of 3D modeling in other types of programs, either CAD systems (Catia, CREO, SolidWorks, SolidEdge, Inventor) or animation programs (3D Studio MAX, Maya, Blender, Cinema 4D, Mode).

Given the analogies between the tools of this type of programs and those of graphic design or digital painting programs, having notions of the latter is also useful.



## 7. Student Outcomes

### Specific Student Outcomes

34(ES) Familiarisation with modeling, visualisation and documentation generation tools.

02(ES) Use multimedia tools for the visualization, presentation and strategic communication of the product and design projects.

### UPV-Generic Student Outcomes

(01) Comprehension and integration

- Activities carried out to achieve the student outcome

Digital sculpture modeling of a final product using different concepts and approaches discussed in class

- Detailed description of the activities

The student will be proposed a global work whose characteristics allow the integration of different work strategies in the development of the product and its execution.

- Assessment criteria

The ability to select techniques and tools (modeling strategies in each case) and the quality of the proposal (complexity, technical degree, result) will be valued

(04) Innovation, creativity and entrepreneurship

- Activities carried out to achieve the student outcome

Proposal of an original product modeled by digital sculpture

- Detailed description of the activities

The student will be asked to propose a product concept with specific characteristics, to be developed using digital sculpture techniques

- Assessment criteria

The quality of the proposal (originality, fulfillment of requirements, aesthetic line, complexity) and its execution (techniques and tools used, modeling efficiency) will be evaluated

## 8. Syllabus

1. INTRODUCTION TO 3D SKETCHING

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2. THREE-DIMENSIONAL SKETCHING TECHNIQUES

1. BASIC MODELING

2. MODELING STRATEGIES

3. CREATION OF COMPLEX GEOMETRIES

4. SET MODELING

3. INTEGRATION OF MODELS IN CAD SYSTEMS

1. CONVERSION FROM MESH TO SOLID. POST-PROCESSING OF SOLIDS.

## 9. Teaching and Learning Methodologies

<u>UN</u>	<u>LE</u>	<u>SE</u>	<u>PS</u>	<u>LS</u>	<u>FW</u>	<u>CP</u>	<u>AA</u>	<u>CH</u>	<u>NCH</u>	<u>TOTAL HOURS</u>
1	5,00	--	--	3,00	--	--	2,00	10,00	5,00	15,00
2	15,00	--	--	20,00	--	--	6,00	41,00	60,00	101,00
3	5,00	--	--	2,00	--	--	2,00	9,00	15,00	24,00
<b>TOTAL HOURS</b>	<b>25,00</b>	--	--	<b>25,00</b>	--	--	<b>10,00</b>	<b>60,00</b>	<b>80,00</b>	<b>140,00</b>

UN: Unit. LE: Lecture. SE: Seminar. PS: Practical session. LS: Lab sessions. FW: Field work. CP: Computer-mediated practice. AA: Assessment activities. CH: Contact hours. NCH: Non contact hours.

## 10. Assessment

### Outline

(05) Academic studies

(09) Project

(08) Portfolio

### Num. Acts Weight (%)

4 50

3 40

3 10

The evaluation will be articulated around a group course project. It will consist of a conceptual proposal based on minimum requirements in the form of a pro-folio (10%), two partial deliveries in the form of academic work (25% each) and a final project (40%). This course aims to introduce two new evaluation strategies, a co-evaluation and an external evaluation by specialists moderated by the teacher. Given the experimental nature of this initiative, and the difficulty of reflecting the involvement of different actors in the different evaluation events, a possible distribution is presented here. The weights of the acts will be those included in the guide, but the weighting of each actor will be subject to the possibility of adequate implementation:

CONCEPTUAL PROPOSAL (10%): 2.5% teacher/5% co-evaluation/2.5% external

DELIVERIES (50% total): 30% teacher/20% co-evaluation

PROJECT (40%): 30% teacher/5% co-evaluation/5% external



#### 10. Assessment

The recovery will be carried out through the reworking of the work and the project, following a theme raised by the teacher.

Students with an attendance waiver will be evaluated in the same way and may participate in a group, being possible to request a specific work in the context of the project to evaluate them individually, which would replace in its rating one of the two deliveries.

#### 11. Absence threshold

<u>Activity</u>	<u>Percentage</u>	<u>Observations</u>
Lecture Theory	20	
Laboratory Practical	20	