

Course Unit	Models and Prototypes		Field of study	Design	
Bachelor in	Art and Design - Minor in Design		School	School of Education	
Academic Year	2022/2023	Year of study	2	Level	1-2
Type	Semestral	Semester	2	ECTS credits	5.0
Code	9898-662-2205-00-22				
Workload (hours)	135	Contact hours	T -	TP 18	PL 20
			TC -	S -	E -
			OT 16	O -	

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) António Jorge Ferreira Vaz, Jacinta Helena Alves Lourenço Casimiro da Costa

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Produce models and / or prototypes as a result of the three-dimensional formalization of ideas, concepts and projects;
2. Make models, validation / test models, presentation models in the different phases of the intellectual production process of an object / product;
3. Plan the three-dimensional execution of a prototype or mock-up;
4. Carry out prototypes, selecting the appropriate scale, materials, technologies and production methods;
5. Know the characteristics and physical qualities of materials and their efficient use;
6. Interpret the fulfillment of the proposed objectives and develop new solutions based on the data resulting from the critical analysis of the model or prototype developed .

### Prerequisites

Before the course unit the learner is expected to be able to:  
Without pre-conditions

### Course contents

1. Types of mock-ups; 2. Techniques and methods of making mock-ups; 3. Techniques and methods of manufacturing prototypes; 4. Prototyping technologies; 5. Assembly; 6. Finishes and color surface treatments.

### Course contents (extended version)

1. Types of mock-ups;
  - Study / volume, no functional, functional.
2. Techniques and methods of making mock-ups;
3. Techniques and methods of making prototypes;
4. Prototyping technologies;
  - Processing equipment and techniques;
5. Assembly;
6. Finishes and color surface treatments;

### Recommended reading

1. ALVES, F. (2001). Protoclick - Prototipagem rápida. Porto: FEUP;
2. CHEE KAI, C. , KAH FAI L. , (2015). 3D Printing and Additive Manufacturing: Principles And Applications. Fourth Edition, World Scientific;
3. GIBSON, I. , ROSEN, D. (2013). Additive Manufacturing Technologies: 3D Printing, Rapid Prototyping, and Direct Digital Manufacturing, Springer;
4. HALLGRIMSSON, B. (2013). Prototyping and Modelmaking for Product Design Laurence King Publishing ;
5. SHIMIZU, Y. , KOJIMA, T. , TANO M. , MATSUDA, S. (2000). Models and Prototypes. Tokyo, Graphic – SHA.

### Teaching and learning methods

In this UC is intended to promote learning in a sequential, progressive way. The following teaching methodologies will be used: theoretical content exposition, technical demonstrations, experimental work and practical work proposals for the application of theoretical contents.

### Assessment methods

1. CONTINUOUS EVALUATION - (Regular, Student Worker) (Final)
  - Projects - 60%
  - Reports and Guides - 30%
  - Presentations - 10%
2. EXAM EVALUATION - (Regular, Student Worker) (Supplementary, Special)
  - Projects - 60% (nº 4 art. 7 Frequency and Evaluation Regulations - Classification obtained in Continuous Assessment)
  - Practical Work - 40% (Theoretical practical work proposal with the respective technical report and oral presentation.)

### Language of instruction

Portuguese, with additional English support for foreign students.

### Electronic validation

António Jorge Ferreira Vaz, Jacinta Helena Alves Lourenço Casimiro da Costa	Helena Maria Lopes Pires Genésio	António José Santos Meireles	Carlos Manuel Costa Teixeira
02-01-2023	03-01-2023	23-01-2023	29-01-2023