



## EXPERIMENTAL DESIGN AND RESEARCH METHODOLOGY

### COORDINATION

BACARDIT DALMASES, ANNA

### ACADEMIC YEAR

2023-2025

### SUBJECT GENERAL INFORMATION

Subject name	EXPERIMENTAL DESIGN AND RESEARCH METHODOLOGY			
Code	4SEM-GA-SUB2			
Typology	1st semester. Continued evaluation.			
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	<i>Degree</i>	<i>Course</i>	<i>Character</i>	<i>Modality</i>
	<i>Joint Master Degree in Leather Technology</i>	<i>1</i>	<i>Compulsory</i>	<i>Blended learning</i>
Coordination	BACARDIT DALMASES, ANNA			
University	UdL			
Language	English			

## LEARNING OBJECTIVES

1. Recognise the methodology of the design of experiments as an important component in scientific research.
2. Analyse the statistical modelling procedure. Analysis and evaluation of the proposed models.
3. Recognise and apply different experimental strategies, considering different scientific and technological situations.
4. To acquire ability to apply the concepts and procedures of statistical optimization.
5. Identify and write different types of documents; from scientific / technological projects to scientific or informative articles; applying research strategies for information and the management programs of appropriate bibliographic references.
6. Make the planning, development and conclusion of a scientific-technical work related to the field of leather.
7. Present orally a scientific-technical work following a logical and simple structure where the key knowledge about scientific and technical communication is revealed.

## LEARNING OUTCOMES

### Basic

CB6 Possess and understand knowledge that provides a basis or opportunity to be original in the development and / or application of ideas, often in a research context.

CB7 That students have the learning skills that allow them to continue studying in a way that will be largely self- directed or autonomous.

CB8 That students are able to integrate knowledge and face the complexity of formulating judgments based on information that, being incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments.

CB9 That students know how to communicate their conclusions and the knowledge and ultimate reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way

CB10 That students have the learning skills that allow them to continue studying in a way that will be largely self- directed or autonomous.

### General

CG1 Appropriately apply mathematical, analytical, scientific, instrumental, technological and management aspects.

CG2 Technically and economically manage projects, facilities, plants, companies and technology centres.

CG3 Research, develop and innovate.

CG4 Lead, plan and supervise multidisciplinary teams.

**Transversal**

CT1 Communicate clearly and precisely orally and in writing in English.

CT2 Efficiently use digital technologies in their professional field.

CT3 Propose innovative, creative and entrepreneurial solutions in situations typical of the professional field.

CT4 Evaluate the sustainability and social impact of the proposed proposals and act with ethical, environmental and professional responsibility.

**Specific**

CE4 Apply theories and principles of leather engineering in order to analyse complex situations and make decisions using engineering resources.

CE9 Project, calculate and design products, processes, facilities and plants, related to the field of leather engineering.

## SUBJECT CONTENT

1. BASIC PRINCIPLES OF STATISTIC DESIGN OF EXPERIMENTS
2. DESIGNS WITH COMPLETELY RANDOMIZED FACTOR
3. MULTIFACTORIAL DESIGNS
4. FACTORIAL DESIGNS
5. FRACTIONAL FACTORIAL DESIGNS
6. LATIN FRAMED DESIGNS
7. OPTIMIZATION METHODS

## METHODOLOGY

1. MASTER CLASSES.
2. PROBLEM RESOLUTION.
5. CASE STUDY.
6. PROJECT PLAN.
9. WRITTEN WORK.
10. PROBLEM BASED LEARNING.
- 11 INVERTED EDUCATION.

## EVALUATION

Exercises	15%
Group work	15%
Oral exposition	25%
Written tests	35%
Tutor's report	10%