

## Course guide

### 220236 - 220236 - Design of Experiments

**Last modified:** 03/05/2023

**Unit in charge:** Terrassa School of Industrial, Aerospace and Audiovisual Engineering  
**Teaching unit:** 715 - EIO - Department of Statistics and Operations Research.

**Degree:** MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Optional subject).

**Academic year:** 2023    **ECTS Credits:** 3.0    **Languages:** Catalan

#### LECTURER

**Coordinating lecturer:** Algaba Joaquin, Ines M.

**Others:**

#### REQUIREMENTS

IMPORTANT: This course cannot be enrolled by students from GRETI

#### TEACHING METHODOLOGY

The course is divided into parts:

Theory classes

Practical classes

Self-study for doing exercises and activities.

In the theory classes, teachers will introduce the theoretical basis of the concepts, methods and results and illustrate them with examples appropriate to facilitate their understanding.

In the practical classes (in the classroom), teachers guide students in applying theoretical concepts to solve problems, always using critical reasoning. We propose that students solve exercises in and outside the classroom, to promote contact and use the basic tools needed to solve problems.

Students, independently, need to work on the materials provided by teachers and the outcomes of the sessions of exercises/problems, in order to fix and assimilate the concepts.

The teachers provide the curriculum and monitoring of activities (by ATENEA).

#### LEARNING OBJECTIVES OF THE SUBJECT

The main objective is to capacitate the students to model and optimize the behavior of processes. To this end, they will learn how to design the experimentation and to analyze and interpret the obtained results using relevant statistical tools.

#### STUDY LOAD

Type	Hours	Percentage
Hours large group	27,0	36.00
Self study	48,0	64.00

**Total learning time:** 75 h

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### Module 1: Design of Experiments

**Description:**

- Linear Regression
- Two-Level Factorial Designs
- Two-Level Fractional Factorial Designs
- Modeling variability
- Weighted Least Squares
- Sequential Design

**Related activities:**

Theory classes, Practical classes, Self-study, Evaluation Activities.

**Full-or-part-time:** 75h

Theory classes: 27h

Self study : 48h

## GRADING SYSTEM

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The final grade depends on the following assessment criteria:

- Linear regression project, weight: 20%
- Test, weight: 30%
- Final exam, weight: 50%

All students who cannot attend either of the two written exams (test and/or final exam), or who want to improve their grade, will have the option to recover it by taking a global test that will be held on the day scheduled in the final exam period calendar. The grade for this recovery test will be between 0 and 10 and will replace the grade of the two written tests as long as it is higher.

## BIBLIOGRAPHY

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**Basic:**

- Montgomery, Douglas C. Design and analysis of experiments. 8th ed. New York: John Wiley & Sons, cop. 2013. ISBN 9781118097939.

## RESOURCES

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**Other resources:**

Material available in ATENEA