66234 - Advanced Statistics

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	531 - Master's in Chemical Engineering
ECTS	3.0
Year	2
Semester	Half-yearly
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. It develops an applied approach to the course and the acquisition of critical analysis skills. A wide range of teaching and learning tasks are implemented, such as

- Lectures, where the teacher explains the theoretical bases that make up this course and solve some "model" problems.

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- Practice sessions, where problems and cases are solved to complement lectures and verify the understanding of the contents.
- Computer lab sessions, where students use specific software to solve problems.
- Oral presentations and assignments, which constitute the most important part of the evaluation in which the student will establish the pillars of academic success.

Students are expected to participate actively in the class throughout the semester.

5.2.Learning tasks

The course includes the following learning tasks:

- Computer lab sessions (30 hours). The theoretical concepts of the topics will be presented, problems will be solved by the teacher and by students under their supervision. Minitab Statistical Software will be used to present different models, address and analyze data associated with problems in the field of Chemical Engineering.
- Autonomous work and study (31 hours). Study throughout the semester is recommended. Work from computer lab sessions, solve problems, individual presentation, etc.
- Tutorials (7 hours). Personalized teacher-student session.
- Assessment (3 hours). Students will make an individual presentation of their projects, which will last up to 15 minutes.

5.3.Syllabus

The course will address the following topics:

1. Introduction. Fundamentals of Statistical Inference.
2. Design of Experiments.
3. Designs with randomized blocks.
4. 2K and fractional designs.
5. Sequential designs.
6. Linear and nonlinear regression.
7. Response surface.
8. Statistical modeling.

5.4.Course planning and calendar

Sessions of two hours are held in the computer lab to solve problems related to real situations (modeling or data analysis) and interpret their results. Problems associated with each topic will be proposed as tasks that must be submitted for review by the teacher. This training activity identifies problems and solves them in the continuous learning process.

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the EINA website.

5.5.Bibliography and recommended resources

BB	Lazic, Zivorad R.. Design of experiments in chemical engineering : a practical guide / Zivorad R. Lazic . - 1st ed., 1st repr. Weinheim : Wiley-VCH, 2007
BB	Montgomery, Douglas C.. Design and analysis of experiments / Douglas C. Montgomery . - 6th ed. Hoboken, NJ : John Wiley & Sons, cop. 2005
BB	Myers, R. H. Response surface methodology: process and product

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	optimization using designed experiments / Myers, R. H., Montgomery, D. C., Anderson-Cook, C. M. John Wiley & Sons, 2016
BB	Peña Sánchez de Rivera, Daniel. Regresión y diseño de experimentos / Daniel Peña Madrid : Alianza Editorial, D.L. 2010