Universidad Zaragoza

1542

Year : 2018/19

60794 - Data and Models for Engineering

Syllabus Information

Academic Year:	2018/19
Subject:	60794 - Data and Models for Engineering
Faculty / School:	110 -
Degree:	532 - Master's in Industrial Engineering
ECTS:	6.0
Year:	2
Semester:	Half-yearly
Subject Type:	Optional
Module:	---

General information

Aims of the course

Context and importance of this course in the degree

Recommendations to take this course

Learning goals

Competences

Learning goals

Importance of learning goals

Assessment (1st and 2nd call)

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

Methodology, learning tasks, syllabus and resources

Methodological overview

The proposed methodology encourages student continuous work. All sessions are held in the computer lab to enable students to use statistical software. The statistical techniques are illustrated with industrial applications by means of case studies based on real data.

Learning tasks

The course includes the following learning tasks:

- **Lectures**. Introduction to the statistical techniques, which are illustrated with case studies in computer lab sessions.
- **Computer lab sessions**. Students will analyze data collections from the industrial field by using statistical software.
- **Tutorials.** The teacher's office hours for students to discuss and review the topics presented in class and the assigned tasks.
- **Assignments** and **autonomous work** (88 hours). Each student will develop several tasks concerning the application of statistical techniques in actual problems drawn from the industrial context.
- **Formative assessment**. Each student should make an oral presentation of 30 minutes focusing on one of the assignments previously done.

Syllabus

The course will address the following topics:

SECTION 1. DEFINE AND MEASURE PHASES

1. Introduction to Six-Sigma methodology.
2. Descriptive analysis and summary of data.
3. Time to failure models and system reliability.
4. Accelerated life testing.

SECTION 2. ANALYZE PHASE.

1. Simple linear regression model.
2. Regression model building.

SECTION 3. IMPROVE PHASE.

1. The role of the design of experiments to improve quality and to obtain stronger products and industrial processes.
2. Basic principles of the design of experiments.
3. Factorial experiments.

SECTION 4. CONTROL PHASE.

1. In-proccess inspection as a part of the production process and sampling plans.
2. Capability analysis.
3. Advanced methods for statistical quality control.

Course planning and calendar

The course is structured in 4 hours per week along the semester. A review of previous knowledge on data analysis is done during the first week.

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.

Bibliography and recommended resources