62954 - Design enhancement through quality techniques

Syllabus Information

Academic Year: 2020/21
Subject: 62954 - Design enhancement through quality techniques
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 562 - Master's in Product Development Engineering
ECTS: 4.5
Year: 1
Semester: Second semester
Subject Type: Optional
Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

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

The student must show the achievement of the expected learning outcomes through the following assessment activities

Continuous assessment:
? Subject work in groups of 2 or 3 people
? Final report
?Case studies as partial deliveries of said work
? Reports of the practices carried out.
? Theoretical exam: the final theoretical exam will evaluate the key aspects of the subject that could not be evaluated by carrying out continuous work.

It is mandatory to pass the final theoretical exam to pass the course.

The evaluation of each part will be included in the following ranges:
? Work (final report) 30%
? Work (practical cases - partial deliveries) 20%
? Practice reports 25%
? Theoretical Exam 25%

Overall evaluation:

Following the regulations of the University of Zaragoza in this regard, in subjects that have continuous or gradual evaluation systems, a global evaluation test will also be scheduled for those students who decide to opt for this second system. This

test will include a theoretical exam (55%), a practical exam (25%) and one or more practical cases (20%).

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The aim of this course is that the students
- gain the knowledge and understanding that provide an opportunity for originality when developing and/or applying ideas, often in the research context;
- can apply their knowledge and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study;
- have the ability to integrate knowledge, handle complexity, and formulate hypothesis based on information that, although incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of their knowledge and arguments;
- communicate their conclusions, knowledge, and supporting arguments to a specialist and non-specialist audience in a clear and unambiguous way;
- acquire the learning skills that enable them to continue studying in an autonomous way.

All these aspects belong to the general competences of the Master's, but, in particular, the aim of this course is that the students acquire the ability to implement techniques and Quality methods during the stages of design and development of the product life-cycle, which is an aspect of great importance in the world in which we live. A wide range of teaching and learning tasks are implemented, such as the analysis and discussion of theoretical contents, lectures, case studies and student participation, among others.

4.2.Learning tasks

The course includes the following learning tasks:
- Lectures (10 hours). The teacher explains the theory contents and encourages discussion among the students to draw conclusions. Some of the contents include different conceptual principles, methodologies and tools to capture information in order to analyze the design in the social context.
- Practice sessions (18 hours). Sessions to solve problems and case studies. Details of the different practical exercises will be provided in class.
- Laboratory sessions (12 hours).
- Assignments (30 hours).
- Tutorials (5 hours).
- Autonomous work and study (35.5 hours).
- Assessment tests (2 hours).

4.3.Syllabus

The subject works the following contents:
?Quality management systems. Design requirements.
? Concepts of standardization, certification, accreditation and homologation. Infrastructure for industrial quality.
? Quality planning tools. Includes: Market analysis. Value analysis. Kano model. DFC - QFD. Design of experiments. Statistical definition of tolerances. AMFE. Bug tree. Design review
? Quality control tools. Includes: Control matrix. Sampling techniques. Statistical processes control. Capacity and stability studies and Product Audit.
? Improvement and problem solving tools. Includes: Flow diagram. Data collection sheet. Charts and diagrams for data analysis. Histogram. Stratification. Cause-effect diagram. Pareto chart. Correlation diagram. Quality control charts. Affinity diagram. Interrelation diagram. Tree diagram. Multicriteria analysis or matrix diagram. Portfolio diagram. Arrow diagram and decision process diagram.

4.4.Course planning and calendar

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.

4.5.Bibliography and recommended resources