Universidad Zaragoza
1542

Year : 2018/19

25816 - Electric and electronic technology

Syllabus Information

Academic Year:	2018/19
Subject:	25816 - Electric and electronic technology
Faculty / School:	110 -
Degree:	558 - Bachelor's Degree in Industrial Design and Product Development Engineering 271 - Bachelor's Degree in Industrial Design and Product Development Engineering
ECTS:	6.0
Year:	271 - Bachelor's Degree in Industrial Design and Product Development Engineering: 2 558 - Bachelor's Degree in Industrial Design and Product Development Engineering: 2
Semester:	Indeterminate
Subject Type:	Compulsory
Module:	---

General information

Aims of the course

Context and importance of this course in the degree

Recommendations to take this course

Learning goals

Competences

To overcome the course, the student will be competent for...

CB01. Que los estudiantes hayan demostrado poseer y comprender conocimientos en un área de estudio que parte de la base de la educación secundaria general, y se suele encontrar a un nivel que, si bien se apoya en libros de texto avanzados, incluye también algunos aspectos que implican conocimientos procedentes de la vanguardia de su campo de estudio.

CB02. Que los estudiantes sepan aplicar sus conocimientos a su trabajo o vocación de una forma profesional y posean las competencias que suelen demostrarse por medio de la elaboración y defensa de argumentos y la resolución de problemas dentro de su área de estudio.

CB03. Que los estudiantes tengan la capacidad de reunir e interpretar datos relevantes (normalmente dentro de su área de estudio) para emitir juicios que incluyan una reflexión sobre temas relevantes de índole social, científica o ética.

CB04. Que los estudiantes puedan transmitir información, ideas, problemas y soluciones a un público tanto especializado

como no especializado.

CB05. Que los estudiantes hayan desarrollado aquellas habilidades de aprendizaje necesarias para emprender estudios posteriores con un alto grado de autonomía.

CG01. Adquirir conocimientos básicos de la actividad profesional del diseño industrial, para combinar los conocimientos generalistas y los especializados con los que generar propuestas innovadoras y competitivas.

CG03. Capacidad para concebir y desarrollar proyectos de diseño, en los aspectos relativos al carácter de productos y servicios, su relación con el mercado, los entornos de uso y el usuario, y atendiendo a su fabricación, selección de materiales y procesos más adecuados en cada caso considerando facetas relevantes como la calidad y mejora de producto.

CG05. Capacidad de obtener, gestionar, analizar y sintetizar información procedente de diversas fuentes para el desarrollo de proyectos de diseño y desarrollo de producto. Utilizar esta documentación para obtener conclusiones orientadas a resolver problemas y tomar decisiones con iniciativa, creatividad y razonamiento crítico generando nuevos conceptos de producto, nuevas ideas y soluciones.

CG06. Capacidad de generar la documentación necesaria para la adecuada transmisión de las ideas por medio de representaciones gráficas, informes y documentos técnicos, modelos y prototipos, presentaciones verbales u otros en castellano y otros idiomas.

CE10. Know the principle of operation, characteristics and applications of the main electrical and electronic devices.

CB: BASIC COMPETENCIES. CG: GENERAL COMPETENCIES. EC: SPECIFIC COMPETENCIES.

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 learning process that has been designed for this course is based on the following:

The learning process has been raised to promote continued student work and focuses on the theoretical basics to understand, analyze, and apply knowledge to solving real problems.

For the development of the subject, on the one hand theoretical sessions will be taught with the entire group, in which the theoretical underpinnings of the subject in the form of master class will be displayed and they will be supplemented by the resolution of classical problems.

On the other hand laboratory sessions will be carried out in small groups where students will work as a member of a group of two or three students. The practice aims to apply the knowledge acquired in the theoretical sessions, focusing on

assemblies of electrical circuits and measurements. It is intended the student to know electrical and electronic devices, in order to acquire manual skills, and which reinforce the theoretical knowledge acquired.

At the same time, during the first weeks of the semester, the student will have to solve some exercises supervised by the Professor, who subsequently individually must explain to the professor to demonstrate their understanding.

Learning tasks

The program offered to students to assist in achieving the expected results includes the following activities...

The course contains 6 ECTS credits corresponding to 150 student hours distributed as follows:

- 43 hour master class: 56% theoretical exposure and 44 % of classical problems resolution.
- 15 hours of laboratory sessions: 5 sessions of 3 hours.
- 3 hours of supervised exercises.
- 24 hours of preliminary work for supervised exercises.
- 60 hours of personal study: distributed throughout the 15-week of the semester.
- 2 hours of testing.
- 3 hours of official written exam.

Syllabus

Agenda:

1.- Basic concepts of electricity.

2.- Diodes and voltage regulators.

3.- Basic concepts of magnetic field.

4.- AC current.

5.- Three-phase current.

6.- Distribution of electric power and low voltage installations.

7.- Electrical protection and safety in electrical devices.

8.- DC motors.

9.- AC motors.

Practice sessions:

Practice 1: Assembly of Basic DC circuits (series, parallel and mixed). Measurement of electrical quantities (resistors, voltages and currents). Variable resistors (LDR, NTC).

Practice 2: Assembly of a power supply (transformer, bridge rectifier, filter, voltage regulator).

Practice 3: Assembly and analysis of basic AC circuits (RL and RC circuit). Management of the function generator and oscilloscope.

Practice 4: Assembly and analysis of three-phase basic circuits. Measurement of three-phase currents, voltages and power.

Practice 5: Basic testing of electric motors (consumption of currents, powers and speeds): DC motor, three-phase motor and single-phase motor.

Practical exercise:

Basic exercise with programmed logic.

Course planning and calendar

The agenda will be conducted over 15 weeks teaching with the following distribution of hours:

Basic concepts of electricity: 6 h

Diodes and voltage regulators: 3 h

Basic concepts of magnetism: 3 h

AC circuits: 10 h

Three-phase current: 6 h

Distribution of electric power, wires and sections: 3 h

Protection and security: 3 h

DC motors: 6 h

AC motors : 3 h

Laboratory practices will be taught in 5 sessions of 3 hours. The practice sessions will take place every 2 weeks

Bibliography and recommended resources