

28830 - Technical Office

Syllabus Information

Academic Year: 2020/21

Subject: 28830 - Technical Office

Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia

Degree: 424 - Bachelor's Degree in Mechatronic Engineering

ECTS: 6.0

Year: 4

Semester: First semester

Subject Type: Compulsory

Module: ---

1.General information

1.1.Aims of the course

The course and its expected results respond to the following approaches and objectives:

- ? Production, from the first sketches, of **complete documents**, so that parts, components, mechanisms, installations and those assemblies represented can be made, manufactured and / or maintained without difficulty.
- ? Knowledge and use of the current regulations concerning Industrial Drawing, all of them necessary for their representation in the plan documents.
- ? Production of Functional Units, Systems, Sets and Subsets, according to current standards and techniques.
- ? Reading and interpreting industrial documents and reports.
- ? Searching, interpretation and classification of documentation.
- ? Acquiring the necessary knowledge for the filing and use of documentation in a Technical Office (T.O.)
- ? Application of CAD systems, peripherals and other computer means and supports for the production of the necessary technical documents in an O.T. (plans, reports, budgets, etc.).
- ? Making of projects, and dealing with the activities connected with projects, in agreement to the responsibilities that the Law 12/1986, 1 of April gives to Technical Engineers.
- ? Carrying out organization, direction and supervision duties of productive systems.
- ? Train professionals with a strong technical background in electricity (electronics), mechanics, control and IT and with personal skills such as entrepreneurship, ability to work in a team and capacity to face new challenges.
- ? Performing tasks related to the adequate attention to the didactic aspects in the teaching-learning process.
- ? Developing critical thinking and ethical responsibility in professional activities.

1.2.Context and importance of this course in the degree

This course is part of the Degree in Mechatronic Engineering offered by EUPLA. It is a 4th year course, taken in the 7th semester and classified, within the Projects module, as compulsory, with a teaching load of 6 ECTS credits, equivalent to 150 hours of student work, out of which, 60 will be spent on classroom activities (theory, problems, laboratory, computer tools ...) and 90 non-class activities (problem-solving, study, seminars, final group work ...).

The course will be divided into two major parts, both developed in section 4.3 of this document:

? Part 1.- Theory on Methodology, Planning and Project Regulations. Project Documents.

? Part 2.- Theory-Practice in Knowledge and Application of Computer Tools in Projects

Both parts, in the design of the course, have application nature and lead to the making of a project-like work, trying to enable students to carry out any technical documentation necessary for the planning, development, implementation, manufacture and maintenance of a project in engineering.

As a major objective of the course students of the Degree in Mechatronic Engineering must acquire the basic knowledge of the profession by learning the concepts, terminology, theory and methodology necessary to understand, suggest and carry out an industrial project. The development of general skills and competences such as teamwork, self-learning and the ability to apply knowledge to practice is also encouraged.

According to this, we can say that it is cross-curricular course itself, where the knowledge that has been learned in previous subjects will be applied in the Final Degree Project and the production of Projects in Engineering.

1.3.Recommendations to take this course

It is recommended to have passed the course on Graphic Expression (Year 1), and completed the compulsory courses of the 2nd and 3rd years

2.Learning goals

2.1.Competences

Upon passing the course, the student will acquire the competences explained on page 45 of the verification report of the Mechatronic Engineering Degree

https://academico.unizar.es/sites/academico.unizar.es/files/archivos/ofiplan/memorias/grado/ingenieria/mv_150.pdf

GI01.- Ability to write, sign and develop projects in the field of industrial electronics engineering that have as their object, energy, electrical and electronic installations, industrial plants and facilities, and manufacturing and automation processes.

GI02.-Capacity for the direction of the target activities of the engineering projects described in section 3.2.

GI03.- Knowledge in basic and technological matters, which enables them to learn new methods and theories, and provides them with versatility to adapt to new situations

GI04.- Ability to solve problems with initiative, decision making, creativity, critical thinking and to communicate and convey knowledge, skills and abilities in the field of Industrial Engineering.

GI05.- Knowledge for the making of measurements, calculations, valuations, appraisals, surveys, reports, work plans and other similar tasks.

GI06.- Capacity to deal with specifications, regulations and mandatory rules.

GI10.- Ability to work in a multilingual and multidisciplinary environment.

GI11.- Knowledge, understanding and ability to apply the necessary legislation in the development of their professions of Industrial Technical Engineer in the field of industrial electronics

GC01.- Ability to integrate and apply mechanical, electronic and control knowledge in the design, development and maintenance of products, equipment or industrial installations.

GC03.- Capacity for abstraction and logical thinking.

GC04.- Ability to learn in a continuous, self-directed and autonomous way.

GC05.- Capacity to evaluate options.

GC06.- Ability to adapt to the rapid evolution of technologies.

GC07.- Ability to lead a team as well as being a committed member of it.

GC08.- Ability to locate technical information, as well as its understanding and assessment.

GC09.- Positive attitude towards technological innovations.

GC10.- Ability to write technical documentation and to present it with the help of appropriate computer tools.

GC11.- Ability to convey their ideas and designs clearly to specialized and non-specialized audiences.

GC13.- Ability to evaluate the technical and economic viability of complex projects.

GC14.- Ability to understand the operation and deal with the maintenance of mechanical, electrical and electronic equipment and installations.

GC15.- Ability to analyze and apply simplified models to equipment and applications.

GC17.- Capacity for correct interpretation of plans and technical documentation.

GC18.- Demonstrate mastery of both knowledge and multidisciplinary skills acquired through individual or group performance, presentation and defense of a project in the field of specific technologies of Mechatronics, which synthesize and integrate such knowledge and skills .

EI12.- Knowledge and skills to organize and manage projects. Learn the organizational structure and functions of a project office.

2.2.Learning goals

The student, to pass this subject, must produce the following results ...

- Understanding of concepts related to the knowledge areas of the degree
- Develop, plan and manage technical projects.
- Understand, sort out and convey information obtained from different sources.
- Present in a coherent way, both oral and written, the work carried out.
- Motivation and self-learning capacity.
- Knowledge of the current regulations.
- Production and interpretation of plans and diagrams according to the regulations and appropriate symbology.
- Manage the necessary computer tools for projects design, production and development.

2.3.Importance of learning goals

This course has a remarkably engineering nature, offering training for the production of reports or technical documents and Projects. It is therefore a cross-curricular subject, of major relevance, particularly in those subjects with content of graphic design (Business profile) and / or management and, mainly, in the Degree Essays and Projects.

Regardless of the field of technology in which the project is framed, and particularly in multidisciplinary contexts, as is the case with Mechatronics Engineering, reaching the learning goals will lead to the achievement of better results in relation to the three objectives or basic pillars of any project: QUALITY, DEADLINE AND COST

3. Assessment (1st and 2nd call)

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

Students must show that they have achieved the expected learning outcomes through the following assessment activities
Continuous Assessment System

? **Participation.** - Attendance, at least 80%, to face-to-face activities (practice tasks, classes, etc.); Attitude and direct observation of skills and request-presentation of the project.

? **Individual theoretical assessment test (10%).** The student must pass a short question or a test type theoretical test in which the knowledge acquired during the explanations will be assessed.

? Individual work 1 (10%):

- o Plant distribution works based on the research on a product to be manufactured

? **Individual work 2 (10%):**

- o Mechanism design and report.

? **Group work 2 (20%):**

- o Computer-based Project Delivery (10%)
- o Presentation of the documentation delivered (50%).

? **Group work 1 (50%):**

- o Computer-based Project Delivery (25%)
- o Presentation of the documentation delivered (25%).

All the tasks must be passed individually (**getting at least 50% of their global value**), the final grade being the result of the sum of all of them when the above-mentioned condition is fulfilled.

Students who, in the continuous assessment, have not passed any of the above sections, must sit an exam ONLY about those unsuccessful parts

? In the case of practical tasks, they must be delivered one week before the date of the call, agreeing with the teacher, if applicable, the date of presentation.

? In the case of theory assessments, they will take a test that will include stuff from all those that have been done during the course on the date and time of the assessment call.

Global Final Assessment Test

Students must choose this option when they cannot adapt to the working pace required in the continuous assessment system. In order to be assessed in one of the official calls he must have delivered the work 10 days before the date of the call, which is posted on the EUPLA Webpage, agreeing on a date for the presentation with the teacher

<http://eupla.unizar.es/asuntos-academicos/examenes>

? **Individual theory assessment test (30%).** The student must pass a short question or a test type exam in which the knowledge acquired during the explanations will be assessed.

? **Individual work 1 (70%):**

- o Computer-based Project Delivery (30%)
- Plant distribution (Component Manufacturing or Activity)
- o Presentation of the documentation delivered (40%).

All the tasks must be passed individually (**getting at least 50% of their global value**) the final grade being the result of the sum of all of them when the above-mentioned condition is fulfilled.

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

"If classroom teaching were not possible due to health reasons, it would be carried out on-line"

The learning process that is designed for this subject is based on the following:

? **Lectures:** theoretical activities conducted by the teacher, so that the theoretical support of the subject is given, highlighting the major issues, structuring them on chapters and / or sections and connecting them to each other.

? **Classroom practice work/seminars/workshops:** Theoretical discussion activities or practice work preferably performed

in the classroom and requiring high student participation and monitored by the teacher

? **Individual/Group tutorials:** These are made on a one-to-one or group basis, at the department. They aim to help solving problems that the students might have.

4.2.Learning tasks

The program that the students are offered to help them achieve the expected results involves the following actions...

? **Lectures (30h):** The concepts and procedures of the subject will be developed and practical examples as support will be developed when convenient

? **Classroom practice work/seminars/workshops (30h):** Students will be divided into several groups being monitored by the teacher and they will develop the concepts and procedures in the computing tools, particularly, CAD-CAE

Tutorials: Supervised practice tasks, which include attendance and individualized or group attention, with a calendar published on the EUPLA website (Included in the 6 weekly hours that the student must dedicate to the course)

? **Personal Study:** Individual work needed for the assimilation of the concepts and procedures for a proper learning process. (Included in the 6 weekly hours that the student must dedicate to the course)

4.3.Syllabus

Essential Contents of the subject for the achievement of learning outcomes

BUSINESS PROFILE

Part 1.- Theory on Methodology, Planning and Project Regulations

1 THE TECHNICAL OFFICE

- ? Technical role in the company
- ? T.O. Functions: Demand forecast and upon request
- ? T.O Organization
- ? T.O. Relation with Departments.
- ? T.O. Role in the client-company relationship

2 DOCUMENT MANAGEMENT

- ? General Issues
- ? Tasks and Dependencies. Reports
- ? Resources and Workloads. Reports
- ? Monitoring and Control. Reports

3.- STANDARDIZATION

- ? Structure of standardization
- ? UNE regulations
- ? CTE
- ? Urban planning

4.- TECHNICAL REPORT

- ? The technical report: Concepts and Classification.
- ? Production of a technical report.

5.-THE PROJECT

- ? The project: Concepts and Classification
- ? Project integrating factors
- ? The phases of the Project
- ? Methodology

6.- PROJECT DOCUMENTS

6.1 REPORT

- ? The descriptive report.
- ? Constructive report.

6.2 DRAWINGS

- ? The plan as a technical document.
- ? General Plans, Systems and Subsystems
- ? Piece drawings.
- ? Manufacturing plans.
- ? Additional information on the plans
- ? Information and Basic Engineering

6.3 MEASUREMENTS AND BUDGET

? The relevance of knowing how to measure and what to measure.

? Parts that make up a budget.

o Single prices.

o Specifying prices.

o Items and Chapters.

? Certifications.

6.4 SPECIFICATIONS

? General specifications.

? Particular specifications

6.5 PREVENTION OF LABOR HAZARDS (PRL)

? Machine Safety - CE marked.

? Safety and health studies (ESS).

? Basic health and safety study.

? Safety and health plan

6.6 APPENDIXES

Part 2: Practice Knowledge and Application of Computer Tools for Project and Technical Report Design

? Application in the development of CAD / CAE (Plants)

? Application in the development of CAD / CAE (Diagrams)

? Documentation

4.4.Course planning and calendar

The lectures and practical sessions in the laboratory are given according to the schedule set up by the School and it is published, prior to the start date of the course, on the EUPLA website, as well as the tutorial schedule.

The most relevant dates - **Course Planning** - (Initial test, task proposal, delivery and presentation etc.) will be given to the students in the classroom at the beginning of the course.

The weekly schedule of the course will be posted officially at

<http://www.eupla.unizar.es/asuntos-academicos/calendario-y-horarios>

The dates of the global assessment test (official calls) will be those posted officially at

<http://www.eupla.unizar.es/asuntos-academicos/examenes>

4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=28830&year=2020

RESOURCES:

- Access to the subject documentation using the Moodle platform