

Academic Year/course: 2022/23

68950 - Complementary training in Industrial Technologies

Syllabus Information

Academic Year: 2022/23

Subject: 68950 - Complementary training in Industrial Technologies

Faculty / School: 326 - Escuela Universitaria Politécnica de Teruel

Degree: 614 - Master's in Innovation and Entrepreneurship in Health and Wellbeing Technologies

ECTS: 6.0

Year: 1

Semester: First semester

Subject Type: ENG/Complementos de Formación

Module:

1. General information

1.1. Aims of the course

The subject “Complementary Training in Industrial Technologies” has been designed to provide to enrolled students, coming from ICT BSc degrees, the competences and knowledge required to follow the lectures of the no-mandatory subjects of the “Innovation and Entrepreneurship in Health and Well-being Technologies” master.

These approaches and objectives are aligned with some of the Sustainable Development Goals, SDG, of the 2030 Agenda (<https://www.un.org/sustainabledevelopment/es/>) and certain specific goals, in such a way that the acquisition of the Learning outcomes of the subject provides training and competence to the student to contribute to a certain extent to their achievement:

- Goal 3: Ensure healthy lives and promote well-being for all at all ages.

Target 3.4 By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.

Target 3.d Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks.

- Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Target 4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

- Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

Target 8.6 By 2020, substantially reduce the proportion of youth not in employment, education or training.

- Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

Target 9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.

1.2. Context and importance of this course in the degree

The subject “Complementary Training in Industrial Technologies” has been oriented towards the establishment of the fundamental basis that are required to follow the no-mandatory subjects. The complementary training and the mandatory courses take place during the first semester of the academic year. Thus, by the second semester, every student has acquired the required competences and skills.

1.3. Recommendations to take this course

The quality warrant committee (Comisión de Garantía de la Calidad de la Titulación) is responsible for recommending the complementary training courses to the students after the admission process.

As a first approach, students coming from ICT degrees ought to take the subject “Complementary Training in Industrial Technologies”.

2. Learning goals

2.1. Competences

Basic competences

CB6 – To acquire the knowledge necessary to carry out original developments of ideas in a research context.

CB7 – To apply theoretical concepts and solve problems in different contexts.

CB10 – To acquire long life learning skills that will allow students to perform well in an autonomous learning scenario.

Specific competences

Understand fundamentals of industrial technologies such as signals and systems, electronic circuits and mechanics.

2.2. Learning goals

1. The student can analyze the behavior of a LTI system from its impulse response and its transfer function.
2. The student can use signal processing tools in time and frequency domains
3. The student understands circuit theory fundamentals.
4. The student applies circuit theory fundamentals to solve problems.
5. The student knows the blocks of an electronic instrumentation system.
6. The student can implement a basic data acquisition system
7. The student understands concepts of static mechanics.
8. The student understands concepts of resistance of materials
9. The student understands the basis of the elements finite method

2.3. Importance of learning goals

Achieving the learning goals established for this subject will allow students to follow the subsequent learning activities

3. Assessment (1st and 2nd call)

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

Reports, lab sessions and other academic works (50%)

Theoretical-practical exercise (50%)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. It is based on M5, M9, M10, M11, M12, M13, M14 AND M15 that favor the development/acquisition of:

- Basic competences: CB6, CB7, CB10
- Specific competences: Understanding of fundamentals of industrial technologies related to signals and systems, electronic circuits and mechanics.

A wide range of teaching and learning tasks are implemented, such as A02, A03, A04, A05, A06 and A07.

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

Classroom materials will be available via Moodle.

Further information regarding the course will be provided on the first day of class.

4.2. Learning tasks

This is a 6 ECTS course organized as follows:

Activities	Hours
A02 Practice sessions	15
A03 Laboratory sessions	18
A04 Reports	21
A05 Autonomous work and study	87
A06 Assessment	3
A07 Virtual office hours	6

4.3. Syllabus

The course will address the following topics:

Lectures

Section 1. Electronic Technology.

Topic 1. Introduction to electronic instrumentation.

Topic 2. Sensors. General concepts.

Topic 3. AD / DA conversion. Digitization of signals.

Topic 4. Signal conditioning: filtering, amplification, circuitry for basic measurement.

Topic 5. Data acquisition systems. Practical examples.

Section 2. Continuum and Structural Mechanics.

Topic 1. Introduction to Statics.

Topic 2. Introduction to the Strength of Materials.

Topic 3. Introduction to the Finite Element Method.

Section 3. Electrical Engineering

Topic 1. Circuit Theory

Section 4. Signal Processing and communications

Topic 1. Impulse response of linear time invariant systems

Topic 2. Time-domain and frequency-domain analysis of signals and systems.

4.4. Course planning and calendar

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

4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=68950>