62949 - Internet of Things

Syllabus Information

Academic Year: 2020/21
Subject: 62949 - Internet of Things
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

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

- Complete the training of graduates, especially in Engineering of Industrial Design and Product Development, with the knowledge not covered in their previous Grade.
- Provide students with both conceptual and practical resources to apply in their professional or research work.
- Strengthen the ability to create new IoT products and services with a strong technological component.
- Encourage judgment and creativity of the students.

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

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

  - **Target 8.2** *Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors.* Throughout the subject, the CE9 competence is worked through the use, knowledge and application of various technological and digital tools of the latest generation to empower students in Information and Communication Technologies (ICTs) and their application in design of products and services.

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

  - **Target 9.4** *By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.* In the course projects (continuous assessment) the CE8 and C10 competences work out complete proposals for the design, development and implementation of IoT solutions: some of these IoT solutions are focused (depending on the academic year and their projects) in the field of smart infrastructures, urban mobility, industrial sustainability, etc.

1.2.Context and importance of this course in the degree

This subject is optional (4.5 ECTS) within the second semester of the Master. It offers innovative knowledge trying to fill a gap of professionals for the new Industry 4.0 and Internet of Things (IoT) paradigm. It offers tools based on Information and Communication Technologies (ICT) to learn to design, develop and implement novel IoT products and services.

1.3.Recommendations to take this course

There are no previous recommendations

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)

In each academic year and in the first class, the % of the following evaluation processes will be specified:
? Final evaluation with a value between 10% and 30% of the final qualification.
? Course works with a value between 40% and 70% of the final qualification.
? Continuous assessment with a value between 0% and 30% of the final qualification.

Following the regulations of the University of Zaragoza in this regard, a global assessment test will also be scheduled for those students who decide to opt for this second system.

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. It is based on a practical approach and learning by experience. A wide range of teaching and learning tasks are implemented, such as lectures, theory and practice sessions, problem-solving, assignments, workshops and seminars, autonomous work and study, and tutorials.

4.2.Learning tasks

The course (60 hours of teaching sessions) includes the following learning tasks:

- Lectures and theory sessions. Their goal is to provide the necessary bases to understand the relevance of some theoretical aspects that cannot be learned in other activities.
- Practice sessions. Their goal is to apply the concepts and techniques introduced in lectures and theory sessions to design, develop, integrate and implement professional IoT solutions.
- Autonomous work and study.

4.3.Syllabus

The course will address the following topics:

Theory

- Internet and the evolution of the web
- Types of network computing
- Internet of things
- Design of intelligent devices
- Electronic communications between devices
- Interconnectivity and interoperability

Practice

- Analysis and design of IoT architectures
- Software / hardware integration
- Technical validation and user evaluation
- Value proposition: Minimum Viable Product (MVP)
- IoT professional solutions

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 or please refer to the course and EINA websites (https://eina.unizar.es/) .

4.5.Bibliography and recommended resources