

Academic Year/course: 2021/22

## 30259 - Agile Methodologies and Quality

### Syllabus Information

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**Academic Year:** 2021/22

**Subject:** 30259 - Agile Methodologies and Quality

**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura

**Degree:** 439 - Bachelor's Degree in Informatics Engineering

**ECTS:** 6.0

**Year:** 4

**Semester:** Second semester

**Subject Type:**

**Module:**

## 1. General information

### 1.1. Aims of the course

In this course the student will learn to tackle the development of software projects by applying agile methodologies and model-driven techniques for the assessment of software quality, where the quality is a basic principle to guarantee.

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

- Goal 4: Quality education.
- Goal 5: Achieve gender equality and empower all women and girls.
  - Target 5.b. Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women.
- Goal 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation.
  - Target 9.1. Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.
- Goal 16: Promote just, peaceful and inclusive societies.
  - Target 16.6. Develop effective, accountable and transparent institutions at all levels.
  - Target 16.7. Ensure responsive, inclusive, participatory and representative decision-making at all levels.

### 1.2. Context and importance of this course in the degree

This subject is offered as optional in the Software Engineering Mention of the Bachelor's Degree in Computer Engineering.

### 1.3. Recommendations to take this course

It is recommended that the student has previously acquired basic principles and techniques of software engineering and project management.

## 2. Learning goals

### 2.1. Competences

- Plan, conceive, deploy and manage projects, services and information systems in all areas.
- Lead the deployment and continuous improvement of projects, services and information systems and assess their economic and social impact.
- Know and apply the principles, methodologies and life cycles of software engineering.

## 2.2. Learning goals

To pass this course, the student will have to demonstrate the following results:

He/she knows the concepts related to the quality of software processes and quality metrics.

He/she knows the most current standards and methodologies in the field of software quality.

He/she knows the paradigm of model-driven software engineering and how to use it for the assessment of software performance and dependability.

He/she knows code review techniques to remove software vulnerabilities within a secure-oriented software development.

He/she knows the foundations of agile methodologies, the current standards and approaches in this field, and how to apply them within a software project development.

## 2.3. Importance of learning goals

Nowadays, every good computer engineer must have the knowledge and skills necessary to face the management and execution of a software project.

Agile methodologies are becoming a way of approaching the development of software projects that is key to their success. The most relevant worldwide ICT companies such as Google, Microsoft, Facebook, Amazon, Spotify or Salesforce recognize that part of their success lies in their agile model of planning, organizing and addressing the short, medium and long terms of their projects.

The number of companies in the world that use agile methodologies has increased exponentially in the last decade, since it has been shown that an agile approach in software project development increases the chances of their success. In the same way, there is an increasing demand for professionals with experience in agile approaches who are able to integrate into workteams and successfully carry out each one of the phases of the agile development of a software project.

Agile methodologies come hand in hand with the quality of software processes, therefore it is essential to have specific training in methodologies for the quality assessment of the software product.

# 3. Assessment (1st and 2nd call)

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

The student will have to demonstrate that he/she achieved the expected learning goals through the following evaluation activities:

Continuous assessment

- Practical work (40%). The objective of the works is to assess the knowledge and skills acquired by the students in the practical sessions.
- Project presentation (40%). Students will be asked to work in team to manage and develop a software project.
- Periodic deliverables (20%). Students will be asked to solve exercise and problems.

Global assessment

For students who do not opt for the continuous assessment, a global assessment exam is planned.

The exam will include questions and/or problems related to the topics taught during the course.

The type and complexity of the questions/problems will be similar to those presented during the classes and practical sessions. The quality and clarity of the answers will be valued, as well as the proposed solution strategies.

# 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. A wide range of teaching and learning tasks are implemented, such as:

- lectures provided by the professors,
- work developed in practice sessions, and
- autonomous work and study (individual or workteam).

## 4.2. Learning tasks

**The course includes the following learning tasks:**

The activities will be divided into theory sessions, problem-solving sessions (with and without professor tutelage), practical sessions, work in groups, and evaluation activities.

## 4.3. Syllabus

The course will address the following topics:

*Agile methodologies*

- Fundamentals, values and principles of Agile
- Design of agile projects
- Agile project management: Scrum, XP y Kanban
- Transitions to Agile

*Software quality*

- Fundamentals of software quality
- Software quality metrics
- Introduction to model-driven software engineering
- Evaluation of software performance and dependability
- Code review within the security-driven software development

#### **4.4. Course planning and calendar**

##### **Sessions and presentations scheduling**

The schedule of the subject will be defined by each academic center based on the academic calendar of the corresponding course.

##### **Student Work**

The dedication of the student to achieve the learning outcomes in this subject is estimated to be 150 hours distributed as follows:

- 60 hours, approximately, of interactive activities (theoretical and problems sessions, and practical sessions)
- 60 hours of work in groups
- 22 effective individual hours of work and study (studying notes and texts, problem solving, class and laboratory sessions preparation, etc.)
- 8 hours devoted to various evaluation tests

#### **4.5. Bibliography and recommended resources**

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30259&Identificador=15423>