

30391 - Software Analysis and Design

Syllabus Information

Academic year: 2024/25

Subject: 30391 - Software Analysis and Design

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 581 - Bachelor's Degree in Telecommunications Technology and Services Engineering

ECTS: 6.0

Year: 4

Semester: First semester

Subject type: Optional

Module:

1. General information

After having taken the subjects Fundamentals of Computer Science and Network and Services Programming, the student is now introduced to the object-oriented paradigm. In this subject you will learn how to build larger software, not only focused on implementation aspects. You will learn how to elicit software requirements, analyze them, perform a design, and propose a set of tests. The subject has a markedly applied character.

2. Learning results

- Understand the software lifecycle, know the existence of different lifecycle models and know under which circumstances to apply each of them.
- Can distinguish the concepts of structured programming from those of object-oriented programming, and more generally understand the object-oriented paradigm from analysis to implementation.
- Be able to perform elicitation of software requirements: functional and non-functional.
- Be able to perform software analysis, distinguishing between static and dynamic models.
- Be able to perform object-oriented software design.
- Know and know how to apply different design patterns and distinguish different architectural patterns.
- Know and know how to use the Unified Modeling Language (UML) in both software analysis and design.
- Know the basic fundamentals of software testing.
- Software program with relational database access libraries: ODBC.
- Learn about the Remote Object Invocation paradigm and the underlying architectural concepts
- Conceive the software project in its entirety, from requirements capture to implementation, and be able to create the necessary documentation for each stage of the life cycle.

3. Syllabus

- Introduction to software engineering: software life cycle
- Software requirements
- Object-oriented analysis: static modeling
- Object-oriented analysis: dynamic modeling
- Object-oriented design: Design patterns
- Software testing
- Distributed objects

4. Academic activities

Lectures: 25 hours

Theoretical sessions in which the contents of the subject will be explained

Problems and cases: 15 hours

Solving real software problems corresponding to theoretical development

Laboratory practices: 20 hours

Development of real software systems

Personal study: 84 hours

Assessment tests. 6 hours

5. Assessment system

The subject will be evaluated in the **continuous assessment** mode by means of the following activities:

Test 1. Exercises on each of the topics developed in the theory classes and problems. Individually or in group will work and then deliver, on the date agreed with the teacher, the exercises proposed for the subject (45% of the grade, minimum 5 out of 10).

Test 2. Results of laboratory practices. Each practice will be evaluated. Each group will be evaluated either during the laboratory session or by submitting the work indicated (35% of the grade, minimum 5 out of 10).

Test 3. Final written test. It will consist of solving problems and theoretical questions on the subject developed at throughout the term (20% of the grade, minimum 5 out of 10).

If the student has not passed any of these activities during the semester, they will have the opportunity to pass the subject by means of a global test in the two official exam calls.

6. Sustainable Development Goals

8 - Decent Work and Economic Growth

9 - Industry, Innovation and Infrastructure