1. OVERVIEW

Subject area	Introduction to Software Engineering
Degree	Bachelor's Degree in Computer Engineering
School/Faculty	Architecture, Engineering and Design
Year	Second
ECTS	6 ETCS
Type	Compulsory
Language(s)	Spanish
Delivery mode	On campus/Online
Semester	First Semester
Year	2022-2023
Coordinating professor	Carlos Ramírez Lizán
Teacher	Carlos Ramírez Lizán

2. INTRODUCTION

"Introduction to Software Engineering" is a core subject area and preliminary in the understanding of this topic, belonging to the "Software Engineering" module/subject. With this subject area, Engineering students will understand the concepts and terminology related to the development and maintenance of software projects, in line with good quality practices. The study will be shaped under a systemic scheme and methodological principles, supporting it in the development of work with autonomous research, practical discipline in design and associated documents.

3. SKILLS AND LEARNING OUTCOMES

Basic skills (CB, by the acronym in Spanish):

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Transversal skills (CT, by the acronym in Spanish):

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Specific skills (CE, by the acronym in Spanish):

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Learning outcomes (RA, by the acronym in Spanish):

- RA1: Understand the terminology of software system development
- RA2: Explain the work environment of software development
- RA3: Interpret the software development's life cycle and processes.
- RA4: Carry out the Modelling and Analysis phases of software development (Elicitation)
- RA5: Apply the requirements specification and analysis of software systems.

The following table shows how the skills developed in the subject area match up with the intended learning outcomes:

Skills	Learning outcomes
CE22, CT12, CB1, CB2, CB3, CB4	RA1: Understand the terminology of software system development
CT12, CT13, CT14, CB2, CB3, CB4, CE10, CE14, CE22	RA2: Explain the work environment of software development
CT12, CT13, CT14, CB2, CB3, CB4, CE10, CE14, CE22	RA3: Interpret the software development's life cycle and processes.
CT12, CT13, CE14, CE22	RA4: Carry out the Modelling and Analysis phases of software development (Elicitation)
CT12, CT13, CE14, CE22, CB4, CE10, CE14	RA5: Apply the requirements specification and analysis of software systems.

4. CONTENTS

The subject is organised into six learning units, which in turn are divided into topics:

Unit 1. Fundamentals and terminology of software engineering.
Topic 1. Basic concepts of software engineering.
Topic 2. Basis of software system development.
Topic 3. Project management tools.

Unit 2. Software development work environment.
Topic 1. Work environment and software process.
Topic 2. Software process and software development life cycle.
Topic 3. Software development life cycle.
Topic 4. Agile software development models.
Topic 5. Scrum and Kanban.

Unit 3. Software system modelling.
Topic 1. Identify software needs.
Topic 2. Requirements specification and documents.
Topic 3. Life cycles and requirements in software production.
Topic 4. Case study of requirements in software production.

Unit 4. Structured development.
Topic 1. Analysis or specification in software development.
Topic 2. Design in software development.
Topic 3. Design representation techniques.

Unit 5. Detailed design.
Topic 1. Computer-aided software engineering (CASE).

Topic 2. Notions of object-oriented design.
Topic 3. Object-oriented design techniques.
Topic 4. Quality aspects of software design.

Unit 6. Object-oriented and agile design techniques.
Topic 1. Static modelling with UML.
Topic 2. Dynamic modelling with UML.
Topic 3. Case study and agile development.

5. TEACHING/LEARNING METHODS

The types of teaching/learning methods are as follows:

- Survey of student' aims and interests in the subject area.
- Lectures, subjects of study and seminars.
- Laboratory work.
- Group investigation and problem-solving.
- Designs, understood as practical proposals for developing solutions applied to specific problems.
- Simulation. These will be used for the development of conditional knowledge.
- Practical case studies.
- Fieldwork, conferences, visits to companies and institutions.

6. LEARNING ACTIVITIES

The types of learning activities, plus the amount of time spent on each activity, are as follows:

On campus:

Learning activity (AF, by the acronym in Spanish)	Number of hours
Lectures	50
Group work	25
Independent working	50
Tutorials, academic monitoring and assessment	25
TOTAL	**150**

Online:

Learning activity (AF, by the acronym in Spanish)	Number of hours
Independent working	50
Independent reading of topics and group discussion	50
Group work	25
Tutorials, academic monitoring and assessment	25
TOTAL	**150**

7. ASSESSMENT

The assessment systems, plus their weighting in the final grade for the subject area, are as follows:

On campus:

Assessment system	Weighting
Exams and tests	30
Development of articles, reports or design briefs	30
Alternative assessment methods (mind maps, diaries, debates, portfolios, peer assessment, etc.)	15
Fieldwork, conferences, visits to companies and institutions	10
Exercises, problems, case studies, designs, simulations and research	15

Online:

Assessment system	Weighting
Knowledge tests, exams, test.	60
Development of articles, reports or design briefs.	10
Alternative assessment methods with mind maps, diaries, debates, portfolios, peer assessment, etc.	10
Involvement in a discussion forum.	5
Exercises, problems, case studies, designs, simulations and research with a corresponding defence in an oral or written test.	15

On the Campus Virtual, when you open the subject area, you will find all the details of your assessable tasks and the deadlines and assessment procedures for each task.

7.1. Ordinary exam period

To pass the subject area in the ordinary exam period, you will need a final grade of at least 5.0 out of 10.0 (weighted average) for the subject area.

In any case, you will need a grade of at least 4.0 in the final test for it to be included in the weighting with the other activities.

7.2. Extraordinary exam period (resits)

To pass the subject area in the ordinary exam period, you will need a final grade of at least 5.0 out of 10.0 (weighted average) for the subject area.

In any case, you will need a grade of at least 4.0 in the final test for it to be included in the weighting with the other activities.

Activities not passed in the ordinary exam period, or those not submitted, must be submitted after receiving the relevant corrections and feedback from the lecturer.

8. TIMELINE

The timeline with submission dates for the assessable tasks in this subject area will be indicated in this section:

Assessable tasks	Date
Requirements Assessment Task	01 December 2022
Engineering Process Questionnaire	27 February 2023
Software Engineering Case Study	23 February 2023

The timeline may be subject to change for logistical reasons related to the activities. Students will be informed of any changes in due time and course.

9. BIBLIOGRAPHY

The reference material for the subject area is as follows:

Introducción a la ingeniería del software [Cerrada Somolinos, José Antonio]

The recommended bibliography is indicated below:
1. PRESSMAN, R. (2006), Ingeniería del Software: Un enfoque práctico. Madrid: McGraw Hill Eds.
2. LARMAN, C. (2003). UML y Patrones: una introducción al análisis y diseño orientado a objetos y al proceso unificado. Madrid: Prentice Eds.
3. BOOCH, G., RUMBAUGH, J., JACOBSON, I. (2000). El lenguaje unificado de modelado. Madrid: Addison Wesley Iberoamericana Eds. Capítulos 2 y 7 del libro BOOCH, G., RUMBAUGH, J., JACOBSON, I. (2000), El proceso unificado de desarrollo de software, Madrid: Pearson Educación
4. FOWLER MARTIN, KENDALL SCOTT. UML gota a gota.

10. DIVERSITY AWARENESS UNIT

Students with special educational needs:

To ensure equal opportunities, curricular adaptations or adjustments for students with special educational needs will be outlined by the Diversity Awareness Unit (UAD, Spanish acronym).

As an essential requirement, students with special educational needs must obtain a report about the curricular adaptations/adjustments from the Diversity Awareness Unit by contacting unidad.diversidad@universidadeuropea.es at the beginning of each semester.

11. STUDENT SATISFACTION SURVEYS

Your opinion matters!

Universidad Europea encourages you to complete our satisfaction surveys to identify strengths and areas for improvement for staff, degrees and the learning process.
These surveys will be available in the survey area of your campus virtual or by email.

Your opinion is essential to improve the quality of the degree.
Many thanks for taking part.

SUBJECT AREA STUDY PLAN
HOW TO CONTACT YOUR TEACHERS

If you have a query about the content or tasks, remember to post it in your subject areas' forums so that all your classmates can read it.

One of them may have the same query as you!
If you have any queries exclusively for the professor, you can send them a private message from the Campus Virtual. Should you need further assistance on a particular issue, you can arrange a tutorial. Frequently reading the messages sent by students and teaching staff is recommended as they constitute another learning channel.

TIMELINE OF ACTIVITIES

The timeline for submitting all assessable tasks for the subject area is indicated in this section:

Week	Contents	Learning activities/assessable tasks	Assessment weighting of assessable task
Weeks 4 and 5	Activity 1	Discussion and wiki fundamentals of Software Engineering. Research and development.	10%
Weeks 7–10	Activity 2	Study and planning a project. System requirements. Use cases.	10%
Week 11	Activity 3	Objective multiple-choice test - interim	20%
Weeks 12 and 13	Activity 4	OO functional modelling	10%
Week 14	Activity 5	Objective multiple-choice test - interim	20%
Weeks 15 and 16	Activity 6	Development of a test plan.	10%
Weeks 17 and 18	Activity 7	Final test	20%

This timetable may be subject to modifications, which will be notified to the student in due time and course.

DESCRIPTION OF ASSESSABLE TASKS

Activity 1. Discussion and wiki fundamentals of Software Engineering. Research and development. In this activity, each student must investigate some basic Software Engineering terms, provided by the professor. In groups, they will create a wiki visible for all the participants and then discuss them.

Activity 2. Study and planning a project. System requirements. Use cases.
The students will be divided into groups and will analyse a project idea based on the possible needs of potential clients. They will develop the points provided by the teacher as a start to a project, developing functional and non-functional requirements as well as the start of the use cases involved. Start of a project offer.

Activity 3. Objective multiple-choice test - interim. Knowledge test on the subject syllabus taught so far. The idea is to study the subject area and detect possible errors.

Activity 4. OO functional modelling. Students in their respective groups will develop two models under object-oriented methodologies. These models will be provided in class and the work points will be reviewed.

Activity 5. Objective multiple-choice test - interim. - Knowledge test on the subject syllabus taught so far. The idea is to study the subject area and detect possible errors.

Activity 6. Development of a test plan. - The students in their respective groups will develop a test plan for the system under development.

Activity 7. Final test. - The final test of the subject area will be an exam of the whole subject area and/or the presentation of the project under construction.

If the professor only takes the project presentation option, he/she will assess terms from the project and ask questions he/she considers necessary from the subject syllabus. Oral presentation carried out in public.

RUBRIC OF ASSESSABLE TASKS

	Independent learning	Practical use of contents	Communication skills and group work	Quality of content and on-time delivery
	Reasoning, analysis and argument of the developed information.	Development of the case study, using the elements given in the subject area under the learning unit's syllabus.	Development of the work in accordance with the case study's objectives. Group communication, collaboration and accountability in their submissions.	Submission of the information, under the required quality guidelines and the needs presented. On-time delivery and with the requested formality.

PLAGIARISM REGULATIONS

In line with the disciplinary regulations for Universidad Europea students:

- Plagiarism, in whole or in part, of intellectual works of any kind is considered a serious offence.
- Students will be excluded from corresponding exam sessions for serious offences relating to plagiarism and the use of fraudulent means to pass the assessment tests. The offence and its reason will also be recorded in the student's academic report.