1.   OVERVIEW

Subject area	Computer Engineering Project I
Degree	Bachelor's Degree in Computer Engineering
School/Faculty	Architecture, Engineering and Design
Year	Second
ECTS	6 ECTS
Type	Compulsory
Language(s)	Spanish
Delivery mode	On campus
Semester	First semester
Year	2022/2023
Coordinating professor	Paula Egido Iglesias
Teacher	Paula Egido Iglesias

2. INTRODUCTION

In this subject area, together with Computer Engineering Project II, a single project will be carried out reflecting the profession of a biomedical engineer, and it will cover the two semester subject areas. It will be designed by a coordinating professor of the subject with help from specialist professors of related subject areas, with the aim that the students put into practice the knowledge of the rest of the subject areas in the syllabus taught in the same year and in previous years. It will have a common basic framework established by the content of the subject areas established in this subject, however, additional content may be included if it is required by the specific project.

The final assessment of the project will require the submission of a report, describing in detail the work carried out and, where appropriate, the prototype developed. Likewise, a public oral defence of the project in front of, at least, the subject coordinator will be required. Professors of related subject areas and, where appropriate, the representative of the supporting external company or organisation may also be present.

3. SKILLS AND LEARNING OUTCOMES

Basic skills (CB, by the acronym in Spanish):
• CB5 - Students have developed the learning skills necessary to undertake further study in a much more independent manner.

General skills (CG, by the Spanish acronym):
• CG1. Ability to conceive, draft, organise, plan, develop and sign projects in the field of computer engineering, with the objective of conceiving, developing and making use of the systems, services and computer applications.
• CG2. Ability to manage project activities in the field of computer science.
• CG3. Ability to design, develop, assess and ensure the accessibility, ergonomics, usability and security of computer systems, services and applications, as well as the information they manage.

- CG4. Ability to define, assess and select hardware and software platforms for the development and implementation of systems, services and computer applications.
- CG10. Knowledge to carry out measurements, calculations, valuations, appraisals, expert's reports, studies, reports, task planning and other similar computer-related work.
- CG11. Ability to analyse and assess the social and environmental impact of technical solutions, understanding the ethical and professional responsibility of the role of a Technical Engineer in Computer Science.

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

- CT1 - Independent learning: Ability to choose the most effective strategies, tools and opportunities for independent learning and implementation of what has been learnt.
- CT4 – Ability to analyse and synthesise: be able to break down complex problems into manageable blocks, evaluate different alternatives and perspectives to find the ideal solution. Synthesising to reduce the complexity and better understand the situation and/or solve problems.
- CT5 - Ability to put knowledge into practice, using the skills acquired in the academic field in mock situations based faithfully on real life issues in the profession they are studying for.
- CT6 - Oral or written communication: Ability to communicate and gather information, ideas, opinions and viewpoints to understand and be able to act, spoken through words or gestures or written through words and/or graphic elements.
- CT7: Awareness of ethical values: Ability to think and act in line with universal principles based on the individual's value, contributing to his/her full development and involving commitment to certain social values.
- CT11: Planning and time management: Ability to set objectives and choose the right means to fulfil them through efficient use of time and resources.
- CT14: Innovation/Creativity: Ability to propose and invent new, original solutions that contribute towards improving problem situations, including ideas from other contexts.
- CT15: Responsibility: Ability to fulfil commitments to themselves and others when undertaking a task and try to meet a range of objectives within the learning process. Ability to face and accept the consequences of actions taken freely.
- CT17: Teamwork: Ability to integrate and collaborate actively with other people, departments and/or organisations in order to reach common goals.

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

- CE8: Ability to plan, conceive, use and direct computer projects, services and systems in all areas, leading their implementation and continuous improvement and assessing their economic and social impact.
- CE13: Knowledge, design and efficient use of the most appropriate data types and structures to solve a problem.
- CE14: Ability to analyse, design, construct and maintain robust, secure and efficient applications, choosing the most appropriate paradigm and programming languages.
- CE19: Knowledge and application of the tools necessary for storing, processing and accessing information systems, including web-based systems.
- CE20: Knowledge and application of the fundamental principles and basic techniques of parallel, concurrent, distributed and real-time programming.
- CE22: Knowledge and application of software engineering principles, methodologies and life cycles.
- CE23: Ability to design and assess personal computer interfaces that guarantee the accessibility and usability of systems, services and computer applications.

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

- RA1 - Manage a software development project using agile methods, sorting the project into developer tasks.
- RA2 - Develop a desktop software application, following the object-oriented programming paradigm, which meets the technical specifications.
- RA3 - Assess the technological needs in the application domain and possible existing solutions.
- RA4 - Work in groups and independently to carry out medium-sized projects.
- RA5 - Responsibly carry out individual tasks in the group work.
- RA6 - Self-assess the results obtained and the performance provided, taking into account one's abilities and demonstrating self-confidence.

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

Skills	Learning outcomes
CB5, CG1, CG2, CG10, CT1, CT6, CT11, CE8, CE22	RA1: Manage a software development project using agile methods, sorting the project into developer tasks.
CG3, CT1, CT5, CE13, CE14, CE19, CE23, CE20	RA2: Develop a desktop software application, following the object-oriented programming paradigm, which meets the technical specifications.
CG1, CG4, CG11, CT4, CT11, CT14	RA3: Assess the technological needs in the application domain and possible existing solutions.
CB5, CG2, CT1, CT17, CE8	RA4: Work in groups and independently to carry out medium-sized projects.
CB5, CT6, CT7, CT15	RA5: Responsibly carry out individual tasks in the group work.
7. ASSESSMENT	RA6: Self-assess the results obtained and the performance provided, taking into account one's abilities and demonstrating self-confidence.

4. CONTENTS

The subject is organised into six learning units which, in turn, are divided into topics (four or five topics depending on the unit):

Unit 1. Introduction to the Subject Area

- Contextualisation
- Objectives
- Rules and regulations
- Forming work groups
- Presentation of the problem

The aim of this unit is to make a general presentation on the subject area and introduce the content which will be developed, explaining the project-based learning methods.

Unit 2. Software engineering tools and processes

- Requirements and use cases: gathering requirements

- Agile methods: SCRUM
- SCRUM dashboards in Trello for the organisation of sprints.
- Writing up engineering project drafts.
- GitHub as a code repository and release manager.

The aim of this unit is to provide students with the basic methods to organise a software project using SCRUM methodology and tools to facilitate this management.

Unit 3. Software development methods and tools

- Model-view-controller pattern
- Interaction with text files
- GUI development
- Development of applications using Java in Eclipse
- Data visualisation using different types of graphics

The aim of this unit is to show the content related to the methods and tools that students must use to develop the project.

Unit 4. Development of a system composed of two desktop applications for the telecare of elderly and/or disabled people

- Supervisor application
- Main user application
- Visualisation of patient's information

5. TEACHING/LEARNING METHODS

The types of teaching/learning methods are as follows:

- Surveys on aims and interests.
- Lectures, subjects of study and seminars.
- Group research and/or problem-solving. • Practical case studies.
- Fieldwork and conferences.

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, reading on main topics and complementary materials, implementation of activities carried out independently and collectively	25
Integrative group work, consisting of participation in debates and seminars, and group implementation of integrative application activities.	50
Independent working	50
Tutorials, academic monitoring and assessment	25
TOTAL	**150**

Online:
Not applicable.

7. ASSESSMENT

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

On campus:

Knowledge tests	5+15=20%
Development of report and submission of project	10+10+20=40%
Meeting minutes and rubric of core skills	5+5+5+5=20%
Group presentation of the projects carried out in public	20%

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.

Online:
Not applicable.

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.
You will need a grade of at least 5.0 in the product's final submission, in which it will be assessed on meeting the minimum functionalities. Otherwise, the final grade for the subject area can never be higher than the grade for this section.
In any case, you must achieve a grade of at least 4.0 in the final knowledge test, in order to determine an average grade for all assessment tasks. If you achieve a grade lower than 4.0, the grade for the subject area will appear as the grade achieved in the knowledge test.

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 must achieve a grade of at least 4.0 in the final knowledge test, in order to determine an average grade for all assessment tasks.
You will need a grade of at least 5.0 in the product's final submission, in which it will be assessed on meeting the minimum functionalities. Otherwise, the final grade for the subject area can never be higher than the grade for this section. Activities not passed in the ordinary exam period, or those not submitted, must be submitted or modified after receiving the relevant corrections from the teacher.

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

Assessable tasks	Date
Activity 0. Diagnostic test	Week 1
Activity 1: Formation of the group with initial idea	Week 3
Activity 2: Meeting minutes and refined idea	Week 5
Activity 3. Submission of Project Draft	Week 7
Activity 4. Mock-ups	Week 7
Activity 5. Submission of Product Backlog	Week 7
Activity 6: Sprint document 1	Week 9
Activity 7: Sprint document 2	Week 11
Activity 8: Sprint document 3	Week 13
Activity 9. Intermediate knowledge test	Week 15
Activity 10: Sprint document 4	Week 16
Activity 11. Final knowledge test	Week 17
Activity 12. Submission of Final Project	Week 17
Activity 13. Presentation and demo	Week 18

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.

7. ASSESSMENT

Ambient Assisted Living Programme
http://www.aal-europe.eu/

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.