Course guide
270085 - PES - Software Engineering Project

Last modified: 30/01/2024

Unit in charge:	Barcelona School of Informatics
Teaching unit:	747 - ESSI - Department of Service and Information System Engineering.
Degree:	BACHELOR'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2023   **ECTS Credits:** 6.0   **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer:	MARÍA JOSÉ CASAÑ GUERRERO - SILVERIO JUAN MARTÍNEZ FERNÁNDEZ
Others:	Primer quadrimestre:
	VICTOR ASENJO CARVAJAL - 21
	MARÍA JOSÉ CASAÑ GUERRERO - 11
	SILVERIO JUAN MARTÍNEZ FERNÁNDEZ - 21
	JORDI PIGUILLEM POCH - 22
	Segon quadrimestre:
	VICTOR ASENJO CARVAJAL - 21, 22
	SILVERIO JUAN MARTÍNEZ FERNÁNDEZ - 11, 12
	MATÍAS SEBASTIÁN MARTÍNEZ MARTÍNEZ - 11
	JORDI PIGUILLEM POCH - 21, 22

PRIOR SKILLS

The subjects learned in the prerequisite courses

REQUIREMENTS

- Prerequisite AS
- Prerequisite ER
- Prerequisite GPS

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CES1.1. To develop, maintain and evaluate complex and/or critical software systems and services.
CES1.3. To identify, evaluate and manage potential risks related to software building which could arise.
CES1.7. To control the quality and design tests in the software production
CES2.1. To define and manage the requirements of a software system.
CES2.2. To design adequate solutions in one or more application domains, using software engineering methods which integrate ethical, social, legal and economical aspects.

Generical:
G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.
G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

TEACHING METHODOLOGY

It is a project-based course, and therefore essentially practical. The classes will be always in classroom laboratory with an expected number of 3 to 5 project teams per classroom. The project teams will be composed of 5 to 7 students, in order to allow implementing a non-trivial prototype.

The explanations of concepts needed (most at the first two weeks, but also at any time whenever necessary) will be in the same classroom. The teacher in the classroom, will act as tutor of the teams. Both presentations will be also provided in lab hours.

The project will start from a general idea and will try to reproduce a real project, with all its elements (deadlines, deliverables, project management, etc..). The methodology used will be agile, organized as an initial inception phase and then 3 or 4 development iterations. The technical issues that will be put into practice will come from the previous courses (IES, BD, ER, AS, GPS).

LEARNING OBJECTIVES OF THE SUBJECT

1.To reinforce concepts already learned in previous courses through his practice in a project
2.Know how to put in practice the principles of project management
3.Knowing how to follow a method in a systematic and disciplined way
4.Knowing how to properly use tool support for project management and development
5.Learn to make project presentations to diverse audiences
6.Learn the technique of writing the project and other documents resulting from the work

STUDY LOAD

Type	Hours	Percentage
Guided activities	6,0	4.00
Hours small group	60,0	40.00
Self study	84,0	56.00

Total learning time: 150 h

CONTENTS

Presentation of the project

Description:
Description of the operation, statement, guide the project, making of project teams

Background

Description:
Brief summary of the knowledge acquired in previous courses that is relevant for the project construction

Development environment

Description:
Description of the development tools needed for the project

Inception phase of the project

Description:
Development of the artifacts corresponding to the inception phase of the project

Initial development phase of the project

Description:
Development of the artifacts corresponding to the two first development sprints of the project

Final development phase of the project

Description:
Development of the artifacts corresponding to the last two sprints of the project

ACTIVITIES

Starting the project

Description:
Read the material, form project teams and assign roles

Specific objectives:
2, 3

Related competencies :
G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 2h
Laboratory classes: 2h

Background

Description:
Make clear the knowledge necessary for the consecution of the project

Specific objectives:
1

Related competencies :
G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 6h
Laboratory classes: 4h
Self study: 2h

Configuration of the development environment

Description:
Become familiar with the tools

Specific objectives:
4

Full-or-part-time: 8h
Laboratory classes: 2h
Self study: 6h

Inception phase of the project

Description:
The project teams develop the project with support from the tutor for questions and queries

Specific objectives:
1, 2, 3, 4, 6

Related competencies :
G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.
G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 34h
Laboratory classes: 16h
Self study: 18h

Initial phase of development of the project

Description:
The project teams develop the project with support from the tutor for questions and queries

Specific objectives:
1, 2, 3, 4, 6

Related competencies :
G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.
G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 34h
Laboratory classes: 16h
Self study: 18h

Final phase of the project

Description:
The project teams develop the project with support from the tutor for questions and queries

Specific objectives:
1, 2, 3, 4, 6

Related competencies :
G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.
G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 34h
Laboratory classes: 16h
Self study: 18h

Submission of the inception phase

Description:
Documentation referring to the project scope, the stakeholders and initial planning

Specific objectives:
1, 2, 3, 4, 6

Related competencies :
G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.
G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 8h
Guided activities: 2h
Self study: 6h

Initial presentation of the project

Description:
Customer-oriented presentation, explaining the functionality of the software system to be built, on what platform, and who is the final user

Specific objectives:
5

Related competencies :
G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.
G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 6h
Guided activities: 2h
Self study: 4h

Intermediate control the progression of the project

Description:
Evaluation of the two first project development sprints according to some predefined criteria

Specific objectives:
1, 2, 3, 4, 6

Related competencies :
G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.
G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 4h
Guided activities: 2h
Self study: 2h

Final presentation of the project

Description:
Engineer-oriented presentation, which should explain the technical content

Specific objectives:
5

Related competencies :
G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.
G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 6h
Guided activities: 2h
Self study: 4h

Final delivery of the project

Description:
Delivery of the project final documentation and hands-on demonstration of a prototype

Specific objectives:
1, 2, 3, 4, 6

Related competencies :
G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.
G5. TEAMWORK: to be capable to work as a team member, being just one more member or performing management tasks, with the finality of contributing to develop projects in a pragmatic way and with responsibility sense; to assume compromises taking into account the available resources.

Full-or-part-time: 8h
Guided activities: 2h
Self study: 6h

GRADING SYSTEM

In a project's course, what needs to be qualifies is the realization of the project itself. The project is developed as team work, but also the team members have assigned different tasks which demand to be evaluated individually. As a result, the final grade of every student is determined applying the following formula:

$$Nfinal = Nteam * IndivFactor$$

The project global grade Nteam includes the project ambition, the artifacts produced, the team management, the documentation and the presentations:

$$Nteam = (0.6*Artifacts + 0.2*ProjectManagement + 0.2*(Docum+Presentations))*Ambition, \text{ where:}$$

- The grade Artifacts is computed as a weighted average of all the delivered artifacts. As the most important artifact, the software executable prototype represents the 50% of this grade.
- In ProjectManagement are included both human aspects (e.g., balanced share of the work, deadline achievement, etc.) and the efficient use of development tools (e.g., code repositori -git-, ...)
- In the documentation and presentation evaluation, are taken into account especially communicational aspects and the neatness of the work done
- The ambition measures the final complexity of the software produced. It is a multiplicative factor comprised among 0.8 and 1.2, determined by the teacher. In any event, this multiplicative factor cannot make the Nteam grade greater than 10.

The individual factor IndivFact is also a multiplicative factor among 0.8 and 1.2 (and similarly, cannot make Nfinal grow beyond 10). This factor is obtained from the evaluation that the teacher makes about the participation of the student in the project development and the evaluation that the team mates make on this very participation. In really exceptional situations, IndivFact can be less than 0.8 for those students who have really very low participation in the project along the course.

The assessment of generic skills is given directly by some project factors:
Oral and Written Communication = (Docum+Presentations)*IndivFactor
Teamwork = ProjectManagement*IndivFactor

and has values □□A, B, C, D, according to:
A if the score is greater than 8.4
B if the score is between 7 and 8.4
C if the score is between 5 and 6.9
D if the score is less than 5

BIBLIOGRAPHY

Basic:
- Cohn, M. Agile estimating and planning. Prentice Hall Professional Technical Reference, 2006. ISBN 0131479415.
- Cohn, M. User stories applied: for agile software developmentnt. Addison-Wesley, 2004. ISBN 9780321205681.
- Professorat PES. Material de l'assignatura.

Complementary:
- Larman, C. Applying UML and patterns: an introduction to object-oriented analysis and design and iterative development. 3rd ed. Prentice Hall PTR, 2005. ISBN 0131489062.
- Rasmusson, J. The Agile samurai: how agile masters deliver great software. The Pragmatic Bookshelf, 2010. ISBN 9781934356586.

RESOURCES

Hyperlink:
- https://about.gitlab.com/- http://www.uml.org/- https://github.com/- https://developer.android.com/studio/index.html- https://bitbucket.org/- https://tree.taiga.io/- https://www.scrum.org/scrum-guide- https://trello.com/- http://www.ibm.com/developerworks/rational/library/769.html#fig4- https://gradle.org/