



Universitat de Lleida

DEGREE CURRICULUM **QUALITY MANAGEMENT AND IMPROVEMENT**

Coordination: GARRIDO NAVARRO, JUAN ENRIQUE

Academic year 2016-17

Subject's general information

Subject name	QUALITY MANAGEMENT AND IMPROVEMENT			
Code	102053			
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Typology	Modality
	Bachelor's Degree in Computer Engineering	3	COMPULSORY	Attendance-based
ECTS credits	6			
Groups	1GG			
Theoretical credits	2			
Practical credits	4			
Coordination	GARRIDO NAVARRO, JUAN ENRIQUE			
Department	INFORMATICA I ENGINYERIA INDUSTRIAL			
Teaching load distribution between lectures and independent student work	6 ECTS x 25h = 150h 40% -> 60h classroom hours (4h per week) 60% -> 90h autonomous work			
Important information on data processing	Consult this link for more information.			
Language	English			
Office and hour of attention	Office: 3.18 (EPS). Hour of attention: send me an e-mail.			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
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Subject's extra information

This course is part of the specialisation in Software Engineering of the Degree in Computer Engineering offered by the Polytechnic School at the Universitat de Lleida.

A **Joint Project** is developed together with other subjects in the 3rd course of the "Software Engineering" specialization:

- Quality Management and Improvement
- Process Model
- Requirements Engineering

Each subject focused on the corresponding aspects of project development. In the case of this subject, software quality management and improvement. The aim of this **Joint Project** is to bring the students with what would be a real-world project of Software Engineering and at the same time, we see that results of the aspects studied in the contexts of a course serve to meet the challenges presented in other courses.

To follow this course properly, some previous knowledge/skills on Software Engineering are recommended. A good level of English (reading, writing, oral) is also recommended.

Learning objectives

- To understand that software quality goes beyond the quality of the code.
- To design a reasonably professional and rigorous software quality plan.
- To implement key aspects of a software quality plan, i.e. conduct software quality assurance tasks, in an effective way.
- To be conversant with the field of software quality assurance (metrics, tools, costs, etc.).
- To keep strengthening important skills good software engineers should have (i.e. ability to make decisions, to meet deadline, to work in teams, to write technical documentation and make oral presentations).

Competences

Strategic Competences of the UdL

- CT2. Mastering a foreign language, especially English.
- CT3. Training Experience in the use of the new technologies and the information and communication technologies.

Cross-disciplinary competences

- EPS11. Capacity to understand the needs of the user expressed in a no technical language.

Specific competences (Software Engineering)

- GII-IS1. Capacity to develop, maintain and evaluate services and software systems that satisfy all the requirements of the user and behave in a reliable and efficient way, they can develop, keep and fulfil quality

requirements, applying the theories, principles, methods and uses of the software engineering.

- GII-IS5. Capacity to identify, evaluate and manage the potential risks that can arise.

Subject contents

Key and basic aspects of software quality

- Ch1. Introduction to Software Quality Assurance (SQA).
- Ch2. SQA in development.
- Ch3. SQA post-development.
- Ch4. SQA from quality experts.

Other aspects of software quality. More advanced aspects of SQA

- Ch5. Introduction to costs in SQA.
- Ch6. Quality aspects in software design and programming.
- Ch7. Further aspects of software testing.
- Ch8. A good SQA engineer.

Methodology

Classes for the course include sessions in which the contents are introduced, through support of educational materials prepared or compiled by lecturers, and group work sessions.

In group work sessions, we use project-based learning methodology. So, students must apply several techniques on the subject under the common project to the three courses in the third year of Software Engineering module.

Theory

- Presentation of the contents of the course.
- Discussion with the students.
- Some sessions will be devoted to Deliverable 1 and 2.

Laboratories

- Laboratory A. Design Reviews and Program Inspections.
- Laboratory B. Software testing and software metrics (tools).

Joint Project

- Deliverable 1. Definition of a Quality Plan (and oral presentation).
- Deliverable 2. Implementation of a Quality Plan (and oral presentation).
- Oral presentation of the project to a committee involving the professors of all 3 subjects. The presentation, common to these subjects, addresses the overall project development.

A note about Joint Project: Both activities are conducted within the context of the software engineering Joint Project developed in three courses (Requirements Engineering, Process Models and Quality Management). Given that each course addresses important aspects of Software Engineering (e.g. requirements, agile methodologies and quality), the project aims to encourage students to deal with them in a real-life scenario, which is simulated in this project.

Development plan

Week	Course Activities	Joint Project Activities	Autonomous Student Work
1	Presentation, Ch1 and Ch2		Study
2	Ch2 (continuation) and Laboratory A		Study and Laboratory A Development
3	Ch2 (continuation) and Laboratory A (continuation and submission)		Study and Laboratory A Development
4	Ch2 (continuation) and Laboratory B		Study and Laboratory B Development
5	Ch3 and Laboratory B (continuation)		Study and Laboratory B Development
6	Ch3 (continuation) and Laboratory B (submission)	Deliverable 1	Study and Deliverable 1 Development
7	Ch4	Deliverable 1	Study and Deliverable 1 Development
8	Ch5	Deliverable 1	Study and Deliverable 1 Development
9		Submission and presentation of Deliverable 1	Study
10	Ch6	Deliverable 2	Study and Deliverable 2 Development
11	Ch7	Deliverable 2	Study and Deliverable 2 Development
12	Ch8	Deliverable 2	Study and Deliverable 2 Development
13	-	Deliverable 2	Study and Deliverable 2 Development
14	-	Deliverable 2	Study and Deliverable 2 Development
15	-	Deliverable 2	Study and Deliverable 2 Development
16-17	Written Exam	Submission and presentation of Deliverable 2	Study
18		Project Presentation	Presentations Preparation
19	Remedial Exam		Study

Evaluation

Acr.	Evaluation Activity	Rate	Minimum Qualification	Group Activity	Mandatory	Remedial Exam
LabA	Laboratory A	12,5%	NO	2 to 3	YES	YES
LabB	Laboratory B	12,5%	NO	2 to 3	YES	YES
D1	Deliverable 1	20%	NO	6 to 7	YES	NO

D2	Deliverable 2	20%	NO	6 to 7	YES	NO
FP	Final Presentation	10%	NO	6 to 7	YES	NO
WR	Written Exam	25%	4	NO	YES	YES
Final Qualification = $0,125 \cdot \text{LabA} + 0,125 \cdot \text{LabB} + 0,2 \cdot \text{D1} + 0,2 \cdot \text{D2} + 0,1 \cdot \text{FP} + 0,25 \cdot \text{WE}$						

Bibliography

Daniel Galin. Software Quality Assurance. From theory to implementation. Pearson Education Limited, 2004.

Stephen Kan. Metrics and Models in Software Quality Engineering. 2nd Edition. Addison-Wesley, 2002.

Ronald Kirk. Software Engineering Quality Practice. Auerback Publications, 2006.

Gordon Schulmeyer. Handbook of Software Quality Assurance. 4th edition. Artech House, 2002.

Ian Sommerville. Software Engineering. Ninth version. Addison-Wesley, 2011.

Jeff Tian. Software Quality Engineering: Testing, Quality Assurance, and Quantifiable Improvement. Wiley - IEEE Computer Society Press, 2005.