Course guide
270083 - ER - Requirements Engineering

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: 2022 ECTS Credits: 6.0 Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: MARIA RIBERA SANCHO SAMSO

Others:
Primer quadrimestre:
SERGIO MORALES GARCIA - 11, 13, 14
SERGIO PAREDES SIGÜENZA - 21, 22
MARIA RIBERA SANCHO SAMSO - 11, 12, 13, 14, 21, 22
ERNEST TENIENTE LOPEZ - 11, 12, 13, 14, 21, 22

PRIOR SKILLS

- An overview of software engineering, and the role it plays in Requirements Engineering
- Basic elements of conceptual modeling in UML / OCL
- Organizations, economic environment, decision-making.
- English reading level.

REQUIREMENTS

- Prerequisite EEE
- Prerequisite IES

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CES2.1. To define and manage the requirements of a software system.
CSI3.5. To propose and coordinate changes to improve the operation of the systems and the applications.
CSI4.1. To participate actively in the specification of the information and communication systems.

General:
G6. SOLVENT USE OF THE INFORMATION RESOURCES: To manage the acquisition, structuring, analysis and visualization of data and information of the field of the informatics engineering, and value in a critical way the results of this management.
TEACHING METHODOLOGY

The course will primarily (but not completely) be taught using the teaching method PBL (Problem Based Learning).

There is a class (conventional) two hours a week in which the teacher presents the topics of the course and all aspects that are not sufficiently covered by other activities. The class also provides a good solution to the exercise of the previous week.

The second main activity of the course is the determination of the requirements of a particular software system. The teacher sketches a specific situation (different from one course to another), for which students have to determine and specify the requirements of a software system, using some methods and languages to be learned previously. This work is performed in group. The number of people and the composition of the group is defined at the beginning of the course (no more than five/six). Each group appoints a coordinator. Each group meets at least once a week for two hours, the hours of laboratory classes. The group submits its work in five deliverables during the course, within limits fixed at the beginning of the course.

Each project meeting consists of three parts: During the first part each student explains the individual work done during the week and the group consolidates the work done by each member; During the second part the group progress towards the new project aspects that must be taken over; the third part is the planing of what will be done during next week, and who will.

The third major activity is the course exercises. The teacher proposes several exercises during the course. Each student must submit (via Athena) his own solution to the exercises, within the specified deadline. The completion of the exercise requires learning new skills.

Note: The teaching method used in the course requires students to acquire new knowledge independently, using bibliographic sources that are normally in English. It is essential that the student has a sufficient level of English without much difficulty assimilating the literature (technical).

LEARNING OBJECTIVES OF THE SUBJECT

1. Understanding the need, objectives and contexts in which engineering requirements activities are performed
2. Knowing defining the objectives of a project.
3. Knowing identifying stakeholders of a project.
4. Understanding what is the system context, the boundary of the system and the use cases.
5. Knowing defining a business process in a particular language.
6. Understanding the need to perform a detailed state of the art of the professional practice within the scope of a project.
7. Knowing performing a detailed state of the art of professional practice within the scope of a project.
8. Understanding what are the scenarios and use cases of a system and what are the relations among them.
9. Knowing defining the use cases of a system by using a particular template.
10. Knowing what are the software system requirements and into what types are classified.
11. Knowing the methods to specify the requirements and contexts in which they are useful.
12. Knowing what the conflicts of requirements engineering, how to analyze them and how to solve them.
13. Understanding the need for argumentation satisfaction of goals on a project.
14. Knowing performing argumentation satisfaction of goals.
15. Knowing writing the requirements specification by using a particular template.
16. Knowing the methods to validate the requirements and in which contexts they are useful.
17. Knowing validating a requirements specification through inspection.
18. Understanding the need of performing the conceptual schema.
19. Knowing developing the conceptual schema from the requirements of a project.
20. Knowing writing a conceptual schema in an executable language.
21. Understanding the relations among the artifacts of requirements engineering, and the need to keep the traceability and consistency.
22. Knowing validating a conceptual schema through inspection.
STUDY LOAD

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<th>Type</th>
<th>Hours</th>
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<tr>
<td>Self study</td>
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Total learning time: 150 h

CONTENTS

- Overview of requirements engineering
- Project goals
- Stakeholders
- The system and its context
- Scenarios and use cases
- Software requirements
- Satisfaction argument of goals.
- Requirements engineering activities: Determination of requirements, documentation, negotiation and validation
- Conceptual modeling in requirements engineering
- Development of the conceptual schema
- Traceability of requirements engineering artifacts
Validation of conceptual schemas

ACTIVITIES

Introduction

Specific objectives:
1

Full-or-part-time: 10h
Theory classes: 2h
Laboratory classes: 2h
Self study: 6h

Goals project

Specific objectives:
2, 3

Full-or-part-time: 10h
Theory classes: 2h
Laboratory classes: 2h
Self study: 6h

E1

Description:
Exercise on project goals.

Specific objectives:
2

Requirements

Specific objectives:
2, 3, 10, 13, 14

Full-or-part-time: 10h
Theory classes: 2h
Laboratory classes: 2h
Self study: 6h

E2

Description:
Exercise on satisfaction argument

Specific objectives:
13, 14
Introduction to requirements engineering

Specific objectives:
4, 5

Full-or-part-time: 10h
Theory classes: 2h
Laboratory classes: 2h
Self study: 6h

Delivering state of the art

Specific objectives:
6, 7

Related competencies:
G6. SOLVENT USE OF THE INFORMATION RESOURCES: To manage the acquisition, structuring, analysis and visualization of data and information of the field of the informatics engineering, and value in a critical way the results of this management.

System, context, use cases

Specific objectives:
4, 5, 6, 7

Related competencies:
G6. SOLVENT USE OF THE INFORMATION RESOURCES: To manage the acquisition, structuring, analysis and visualization of data and information of the field of the informatics engineering, and value in a critical way the results of this management.

Full-or-part-time: 10h
Theory classes: 2h
Laboratory classes: 2h
Self study: 6h

E3

Description:
Modeling business processes

Specific objectives:
5

Determining requirements

Specific objectives:
9, 10, 11

Full-or-part-time: 10h
Theory classes: 2h
Laboratory classes: 2h
Self study: 6h
### E4

**Description:**
Exercise on essential and real use cases

**Specific objectives:**
8, 9

### Negotiating requirements

**Specific objectives:**
12

**Full-or-part-time:** 10h
- Theory classes: 2h
- Laboratory classes: 2h
- Self study: 6h

### D1

**Description:**
Preliminary delivery on requirements specification

**Specific objectives:**
2, 3, 4, 8, 9, 10, 15

### Validation requirements

**Specific objectives:**
16, 17

**Full-or-part-time:** 10h
- Theory classes: 2h
- Laboratory classes: 2h
- Self study: 6h

### E5

**Description:**
Exercise on validation requirements

**Specific objectives:**
16, 17
### Recap on requirements

**Specific objectives:**
2, 3, 4, 8, 9, 10, 13, 14, 15, 16, 17, 21, 22

**Full-or-part-time:** 9h
Theory classes: 1h
Laboratory classes: 2h
Self study: 6h

### Q1

**Description:**
Questionnaire on basic concepts of requirements engineering. The questionnaire will be answered online within the class. Each student must bring a laptop or similar to access and respond to the questionnaire.

**Specific objectives:**
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17

**Related competencies:**
G6. SOLVENT USE OF THE INFORMATION RESOURCES: To manage the acquisition, structuring, analysis and visualization of data and information of the field of the informatics engineering, and value in a critical way the results of this management.

**Full-or-part-time:** 1h
Guided activities: 1h

### D2

**Description:**
Final delivery of the requirements specification

**Specific objectives:**
2, 3, 4, 8, 9, 10, 11, 13, 14, 15, 16, 17

### Conceptual modeling in requirements engineering

**Specific objectives:**
18, 20, 21

**Full-or-part-time:** 10h
Theory classes: 2h
Laboratory classes: 2h
Self study: 6h

### E6

**Description:**
Exercise on the executable OCL

**Specific objectives:**
20
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<th><strong>The structural scheme</strong></th>
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<td><strong>Specific objectives:</strong></td>
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<td>19, 20</td>
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<td><strong>Full-or-part-time:</strong></td>
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<td><strong>Description:</strong></td>
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<td>Exercise on schema validation</td>
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<td><strong>Specific objectives:</strong></td>
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Recap subject

**Specific objectives:**
18, 19, 20, 21, 22

**Full-or-part-time:** 9h
- Theory classes: 1h
- Laboratory classes: 2h
- Self study: 6h

Completion of the final delivery of the conceptual scheme

**Specific objectives:**
19, 20, 22

**Full-or-part-time:** 10h
- Self study: 10h

D4

**Description:**
Final delivery of conceptual schema

**Specific objectives:**
19, 20, 21, 22

Q2

**Description:**
Questionnaire on basic concepts of conceptual modeling in requirements engineering. The questionnaire will be answered online within the class. Each student must bring a laptop or similar to access and respond to the questionnaire.

**Specific objectives:**
18, 19, 20, 21, 22

**Full-or-part-time:** 1h
- Guided activities: 1h

**GRADING SYSTEM**
The generic competence assigned to the course is graded with values A, B, C, D, where:
- A indicates that the competence has been accomplished with a level of excellence
- B indicates that the competence has been accomplished with the desired level
- C indicates that the competence has been accomplished with a sufficient level
- D indicates that the competence has not accomplished

This grade comes from the evaluation of the first deliverable of the project (Context analysis).
BIBLIOGRAPHY

Basic:

Complementary: