

Academic Year: ( 2019 / 2020 )

Review date: 05-05-2020

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: ALVAREZ RODRIGUEZ, JOSE MARIA

Type: Compulsory ECTS Credits : 6.0

Year : 4 Semester : 1

**REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)**

Writing and Communication Skills  
Principles of Software Development

**OBJECTIVES**

General Competences

CG-1. Apply appropriate theoretical and practical methods to the analysis, design and troubleshooting, providing solutions that respect the rules of accessibility, ergonomics and safety at work and to comply with existing legislation.

Specific Competences Common to Computer Engineering

CECRI-1. Capacity to design, develop, select and evaluate applications and systems, ensuring their reliability, safety and quality, according to ethical principles and legislation and regulations.

CECRI-4. Capacity to develop the technical specifications of a computer facility that meets the standards and regulations.

CECRI-8. Ability to analyze, design, build and maintain applications in a robust, secure and efficient choosing the paradigm and the most appropriate programming languages.

CECRI-16. Knowledge and application of the principles, methodologies and life cycles of software engineering.

**DESCRIPTION OF CONTENTS: PROGRAMME**

Block I. Requirements engineering

Unit 1. Introduction to requirements engineering

Unit 2. Elicitation, description and management of requirements

Unit 3. Properties, attributes and organization of requirements

Unit 4. Types of requirements

Block II. Conceptual modeling with UML

Unit 5. Introduction to conceptual modeling

Unit 6. Conceptual modeling: classes and objects

Unit 7. Conceptual modeling: associations

Unit 8. Conceptual modeling: hierarchies

Block III. Architectural modeling with UML

Unit 9. Introduction to architectural modeling

Unit 10. Architectural modeling: components

Unit 11. Architectural modeling: interfaces

Unit 12. Architectural modeling: design by contracts

**LEARNING ACTIVITIES AND METHODOLOGY**

Theoretical Lectures: 1 ECTS

Practical Lectures: 1 ECTS

- Exercise resolution
- General tutoring
- Partial oral expositions of the project

Team Work: 3 ECTS

- Proposal of project statement
- Project development
- Project peer review

- Proposal of questions for final exam
- Individual Work: 1 ECTS
- Contribution to team project
  - Study and preparation of final exam

## ASSESSMENT SYSTEM

### CONTINUOUS EVALUATION (40%)

- Oral presentations of the project: 30%
- Proposal of questions for final exam: 10%

### FINAL EVALUATION (60%)

- Final project report: 30%
- Final examination: 30%

A minimum grade of 5.0 both in the final project report and in the final examination is required to pass the course.

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| <b>% end-of-term-examination:</b>   | 60 |
| <b>% of continuous assessment (assignments, laboratory, practicals...):</b> | 40 |

## BASIC BIBLIOGRAPHY

- Alexander, I. and Stevens, R. Writing Better Requirements, Addison-Wesley, 2002
- Arlow, J. and Neustadt, I. UML and the Unified Process. Practical Object-Oriented Analysis & Design, Addison-Wesley, 2002
- Braude, E. Software Engineering. An Object-Oriented Perspective., John Wiley & Sons, 2001..
- ESA Board for Software Standardisation and Control (BSSC). ESA Software Engineering Standards., European Space Agency, February 1991..
- Fowler, M. and Scott, K. UML Distilled. A Brief Guide to the Standard Object Modeling Language, Addison-Wesley, 2004
- Larman, C. Applying UML and Patterns. An Introduction to Object-Oriented Analysis and Design and the Unified Process, Prentice Hall, 1998
- Pressman, Roger S. Ingeniería del software: un enfoque práctico, 6ª ed., McGraw-Hill, 2006..
- Sommerville, I. Ingeniería del Software., Pearson-Addison Wesley, 2005..
- Sommerville, I. and Sawyer, P. Requirements Engineering: A Good Practice Guide, John Wiley & Sons, 1997
- Stevens, P. and Pooley, R. Using UML, Software Engineering with Objects and Components, Addison-Wesley, 2000
- Wiegers, K. and Beaty, J. Software Requirements, Microsoft Press, 2013

## BASIC ELECTRONIC RESOURCES

- UC3M . The Software Architect Code: Building the Digital World: <https://www.edx.org/course/software-architect-code-building-digital-uc3mx-inf-1x>
- edX Platform . List of courses on Software Engineering:  
[https://www.edx.org/course?search\\_query=SOFTWARE+ENGINEERING](https://www.edx.org/course?search_query=SOFTWARE+ENGINEERING)