

Academic Year: (2023 / 2024)

Review date: 26-04-2023

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: GENOVA FUSTER, GONZALO

Type: Compulsory ECTS Credits : 6.0

Year : 5 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Programming (1st year / 1st semester)
Algorithms and Data Structures (1st year / 2nd semester)
Software Engineering (2nd year / 1st semester)
Software Development (2nd year / 2nd semester)

OBJECTIVES**LEARNING OUTCOMES**

R1. Knowledge and understanding: To have basic knowledge and understanding of the scientific and technological foundations of Computer Engineering, as well as a specific knowledge of computer science, computer engineering and information systems.

R4 Research and Innovation: Be able to use appropriate methods to conduct research and make innovative contributions in the field of Computer Engineering.

R5 Engineering Applications: Graduates will be able to apply their knowledge and understanding to solve problems, conduct research and design devices or processes in the field of Computer Engineering according to criteria of cost, quality, safety, efficiency, environmental friendliness and ethical implications. These skills include knowledge, use and limitations of computer systems, process engineering, computer architectures, computational models, equipment, practical work, technical literature and information sources.

R6 Transversal Competences: To have the necessary skills for the practice of engineering in today's society. The graduate will have the ability to work effectively both individually and in teams, showing communication and team coordination skills. On the other hand, they will demonstrate awareness of the responsibility of engineering practice, social and environmental impact, and commitment to professional ethics and standards of engineering practice. Finally, you will demonstrate skills and competencies related to best practices in project management, project management tools and risk analysis.

BASIC AND GENERAL COMPETENCES

CG1 - Apply appropriate theoretical and practical methods for analysis, design and problem solving, providing IT solutions that respect accessibility standards, ergonomics and safety at work and comply with existing legislation.

CGO1 - Ability to conceive, draft, organize, plan, develop and sign projects in the field of computer engineering that aim, according to the knowledge acquired, the design, development or operation of computer systems, services and applications.

CGO5 - Ability to design, develop and maintain computer systems, services and applications using software engineering methods as a tool for quality assurance, in accordance with the knowledge acquired.

CGO8 - Knowledge of the basic subjects and technologies, which enable them to learn and develop new methods and technologies, as well as those that provide them with great versatility to adapt to new situations.

SPECIFIC COMPETENCES

CECRI2 - Ability to plan, conceive, deploy and manage IT projects, services and systems in all areas, leading their implementation and continuous improvement and assessing their economic and social

impact.

CECRI16 - Knowledge and application of the principles, methodologies and life cycles of software engineering.

MENTION COMPETENCES

CESI1 - Ability to integrate Information and Communication Technologies solutions and business processes to meet the information needs of organizations, enabling them to achieve their objectives effectively and efficiently, thus giving them competitive advantages.

CESI2 - Ability to determine the requirements of the information and communication systems of an organization taking into account security aspects and compliance with regulations and legislation in force.

CESI3 - Ability to actively participate in the specification, design, implementation and maintenance of information and communication systems.

CESI4 - Ability to understand and apply the principles and practices of organizations, so that they can act as a liaison between the technical and management communities of an organization and actively participate in the training of users.

CESI5 - Ability to understand and apply the principles of risk assessment and apply them correctly in the development and implementation of action plans.

CESI6 - Ability to understand and apply the principles and techniques of quality management and technological innovation in organizations.

DESCRIPTION OF CONTENTS: PROGRAMME

- Software development paradigms
- Evolution of visual development environments
- Visual modeling languages
- Programming languages for visual components.
- Design of systems based on visual components.

LEARNING ACTIVITIES AND METHODOLOGY

THEORETICAL-PRACTICAL CLASSES (1,5 ECTS). In them the knowledge to be acquired by the students will be presented. They will receive the class notes and will have basic reference texts to facilitate the follow-up of the classes and the development of the subsequent work. Exercises will be solved by the student that will serve as self-evaluation and to acquire the necessary skills. Classes of problems, in which the problems proposed to the students will be developed and discussed.

WORKSHOPS AND/OR LABORATORY PRACTICES (0.5 ECTS).

TUTORIALS (1.0 ECTS). Individualized assistance (individual tutorials) or in group (collective tutorials) to the students by the professor.

INDIVIDUAL OR GROUP WORK OF THE STUDENT (2.0 ECTS).

ASSESSMENT SYSTEM

The evaluation of the course will consist of partial deliveries and a final practice where all the knowledge acquired in the course is applied. The evaluation system includes the assessment of the directed academic activities and practices according to the following weighting.

CONTINUOUS EVALUATION (70%). In this evaluation will be valued the Works, Presentations, Debate Performance, Class Exhibitions, Exercises and Laboratory Practices.

FINAL EXAM (30%). In which the knowledge, skills and abilities acquired throughout the course will be globally assessed.

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| % end-of-term-examination: | 0 |
| % of continuous assessment (assignments, laboratory, practicals...): | 100 |

BASIC BIBLIOGRAPHY

- J.D. Meier, Alex Homer, David Hill et al. Patterns & practices Application Architecture Guide 2.0, Microsoft Corporation 2009.
- Stevens, P Using UML: Software Engineering with Objects and Components (2nd Edition), Addison-Wesley, 2006.
- Thomas M. Shortell (ed) INCOSE Systems Engineering Handbook: A Guide for System Life Cycle Processes and Activities, Wiley, 2015

BASIC ELECTRONIC RESOURCES

- Functional Mock-up Interface . FMI Site: <https://fmi-standard.org/>
- INCOSE . INCOSE Site: <https://www.incose.org/>
- Object Management Group . OMG SysML Site: <http://www.omgsysml.org/>