

Academic Year: ( 2020 / 2021 )

Review date: 10-07-2020

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: GENOVA FUSTER, GONZALO

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

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

Programming  
 Algorithms and Data Structures  
 Principles of Software Development  
 Software Engineering

**OBJECTIVES**

- General competences:
  - Team working. (PO d)
  - Capacity for Analysis and Synthesis (PO a).
  - Capacity for Abstraction (PO a).
  - Practical resolution of problems (PO c).
  - Application of knowledge in the real world (PO a).
- Specific competences
  - Cognitive (PO a)
    - Knowledge of the existing visual development environments, in the market.
    - Understanding of the capacities and the limits of visual development.
    - Knowledge of software applications, design and modeling techniques.
    - Rapid and methodical development of a software application.
  - Procedural / Instrumental (PO a, g, k)
    - Distinguish the cases in which visual development is convenient.
    - Understand and apply the principles of visual components implementation.
    - Approach visual development limitations, proposing effective solutions.
    - Use a visual development environment exploiting its capabilities to the maximum.
  - Attitudinal (PO c, d)
    - Capacity for generating new ideas (creativity).
    - Perseverance in the search of optimal solutions to a problem.
    - Ability to communicate and propose in an effective manner the solution to a problem.
  - SPECIFIC SKILLS OF COMPUTER ENGINEERING
    - Ability to plan, design, deploy and manage projects, services and systems across areas, leading its implementation and continuous improvement and assessing their economic and social impact. (CER12)
    - Knowledge and application of the principles, methodologies and life cycles of software engineering. (CER116)
  - SPECIFIC SKILLS OF INFORMATION SYSTEMS
    - Ability to integrate solutions Information Technology and Communications and processes business to meet the information needs of organizations, enabling them to achieve its objectives effectively and efficiently, giving them a competitive advantage. (CES11)

**DESCRIPTION OF CONTENTS: PROGRAMME**

Content description:

**SYSTEMS ENGINEERING**

- Introduction to Systems Engineering as Life Cycle and Process (INCOSE)
- Estimation: Cost and budget
- Project management
- Configuration Management

## SOFTWARE AND SYSTEM DEVELOPMENT PROCESS

- Life Cycles
- Requirements Engineering
- System Architecture
- Physical Design

## IMPLEMENTATION, VERIFICATION AND VALIDATION OF SYSTEMS

- System verification
- System validation

## LEARNING ACTIVITIES AND METHODOLOGY

Theoretical Classes: 1 ECTS.

They have the objective of reaching the specific cognitive competences of the course (PO a).

Practical Classes: 2 ECTS.

They develop the specific instrumental competences and the greater part of the transversal competences (PO a, c, d, g).

Guided Academic Activities:

- With the presence of the Teacher: 1 ECTS

Explanation of the main software development environments, demonstration of software and systems development methodologies (PO a, c, d, g, k).

- Without the presence of the Teacher: 2 ECTS.

Development of a project using a software and systems development methodology (PO a, c, k).

- Exercises and Exam: 1 ECTS.

They have the objective to influence and complement the development of the specific cognitive and procedural capacities (PO a, c).

## ASSESSMENT SYSTEM

The final evaluation of the course will consist of the evaluation of the exercises done during the course and the evaluation of the final project, where all the knowledge acquired during the course will be applied. The evaluation system includes the assessment of the guided academic activities and assignments according to the following weighing:

- Exercises: 30% (PO a, c)
- Final Project 50% (PO a, c, d, g)
- Guided Academic Activities:
  - With the presence of the Teacher: 15% (PO a, c, d, g, k)
  - Without the presence of the Teacher: 5% (PO a, c, k)

|   |     |
|---|-----|
| <b>% end-of-term-examination:</b>   | 0   |
| <b>% of continuous assessment (assignments, laboratory, practicals...):</b> | 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

- INCOSE . INCOSE Site: [www.incose.org](http://www.incose.org)