

Academic Year: ( 2020 / 2021 )

Review date: 10-07-2020

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: DUGARTE PEÑA, GERMAN LENIN

Type: Compulsory ECTS Credits : 6.0

Year : 2 Semester : 2

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

Basics of information technologies

**OBJECTIVES**

CB1. That students have demonstrated to possess and understand knowledge in an area of study that starts from the base of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that imply knowledge coming from the forefront of his/her field of study

CB2. That students know how to apply their knowledge to their work or vocation in a professional manner and possess the skills that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study

CB4. That students can transmit information, ideas, problems and solutions to a specialized and non-specialized public

CB5. That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy

CG5 Know how to design, plan and align the evolution of technology (systems and information and communication technologies) concerning the organization of the company and its evolution.

CT3. Be able to assess the reliability and quality of information and its sources, ethically using such information, avoiding plagiarism, and in accordance with the academic and professional conventions of the study area.

CT5. Know and be able to handle interpersonal skills on initiative and responsibility, negotiation, emotional intelligence, etc. as well as calculation tools that allow to consolidate the basic technical skills that are required in any professional field.

CE14 Know the principles of software development, its production and implementation in the different organizational areas of the companies

CE15. Know the main technology products and technology trends associated with the world of management and business, and know how to design their implementation and innovation in organizations.

RA1. Have acquired advanced knowledge and demonstrated an understanding of the theoretical and practical aspects and the methodology of work in the field of business administration and digital technology with a depth that reaches the forefront of knowledge

RA2. Power, through arguments or procedures developed and sustained by themselves, apply their knowledge, understanding of these and their problem-solving abilities in complex work environments characteristic of the fourth era, making use of creative and innovative ideas, capable of creating new business opportunities.

RA5. Know how to communicate clearly and accurately to all types of audiences (specialized or not), knowledge, methodologies, ideas, problems and solutions in the field of business and technology.

RA6. Be able to identify their training needs to be always at the forefront of management in the digital age, organizing their learning with a high degree of autonomy in all types of contexts (structured or not).

**DESCRIPTION OF CONTENTS: PROGRAMME**

I Software concepts, principles, processes and roles involved and the way of thinking in the digital age

1. Understand the concepts of software product, software service and software system

2. Understand the main processes and the principles that guide the software production

3. Understand the roles of a digital business professional

4. Know thinking approaches for solving existing and emerging systems problems in an interconnected world

II - Envisioning software systems for the digital age

1. Understand the need to envision software systems as part of an interaction ecology whose center are users and their goals
2. Know creativity and participatory design methods to design successful products and user experiences
- III Define user needs of digital products / services
  1. Know and understand the importance of defining correct, consistent and complete specifications for digital products and services
  2. Know and understand the need of creating digital products and services from existing software components
- IV Methodologies and processes for the management of digital products development
  1. Functions of the software/service product owners in the architectural design and testing
  2. Know the philosophy and fundamentals of effective and agile digital product management
  3. Understand the importance of the testing process of digital products and services within an agile product delivery

#### LEARNING ACTIVITIES AND METHODOLOGY

AF1. THEORETICAL-PRACTICAL CLASSES. The professor will present the knowledge that students should acquire. They will receive the class notes and will have basic texts of reference to facilitate the follow-up of the classes and the development of the subsequent work. Exercises, practical problems on the part of the student will be solved and workshops and evaluation tests will be carried out to acquire the necessary skills.

AF2. TUTORIALS. Individualized assistance (individual tutorials) or group (collective tutorials) to students by the teacher.

AF3. INDIVIDUAL OR GROUP STUDENT WORK.

MD1 THEORY CLASS. Exhibitions in the teacher's class with the support of computers and audiovisual media, in which the main concepts of the subject are developed and the materials and bibliography are provided to complement the students' learning.

MD2. PRACTICES. Resolution of practical cases, problems, etc. raised by the teacher individually or in groups.

MD3. TUTORIALS. Individualized assistance (individual tutorials) or group (collective tutorials) to students by the teacher. For subjects of 6 credits, 4 hours will be dedicated with 100% of attendance.

#### ASSESSMENT SYSTEM

SE1. FINAL EXAM. In which the knowledge, skills and abilities acquired throughout the course will be assessed globally.

SE2. CONTINUOUS ASSESSMENT. In it, work, presentations, debates, exhibitions in class, exercises, practices and work in the workshops throughout the course will be evaluated.

<b>% end-of-term-examination:</b>	0
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	100

#### BASIC BIBLIOGRAPHY

- UC3M The Software Architect Code: Building the Digital World, edX, 2017

#### ADDITIONAL BIBLIOGRAPHY

- Bass, L. Software architecture in practice., Pearson Education, 2015
- Cross, N. Design thinking: Understanding how designers think and work., Berg, 2011
- Gharajedaghi, J. Systems Thinking - Managing Chaos and Complexity: A Platform for Designing Business Architecture, Elsevier Inc., 2012
- Hanington, B. and Martin, B. Universal Methods of Design: 100 Ways to Research Complex Problems, Develop Innovative Ideas, and Design Effective Solutions., Rockport Publishers, 2012
- Kulak, D., & Li, H. The Journey to Enterprise Agility, Springer, 2017
- Sommerville, I. Software engineering., Pearson, 2015
- Sterman, J. Business Dynamics: Systems Thinking and Modeling for a Complex World, McGraw-Hill, 2000

#### BASIC ELECTRONIC RESOURCES

- UC3M . The Software Architect Code: Building the Digital World: <https://www.edx.org/es/course/the-software-architect-code-building-the-digital-world>