Software Quality

Academic Year: (2020 / 2021)   **Review date: 24-02-2021**

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: FRAGA VAZQUEZ, ANABEL

Type: Compulsory ECTS Credits : 6.0

Year : 1 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

None

OBJECTIVES

BASIC SKILLS:
1.- That the students know how to apply the acquired knowledge and their ability to solve problems in new or little-known environments within broader (or multidisciplinary) contexts related to their area of ¿¿study.
2.- That students are able to integrate knowledge and face the complexity of formulating judgments from information that, being incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments.
3.- That the students know how to communicate their conclusions and the latest knowledge and reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way.
4.- That students possess the learning skills that allow them to continue studying in a way that will have to be largely self-directed or autonomous.

GENERAL COMPETENCIES:
1.- Ability to manage works and installations of computer systems, complying with current regulations, ensuring the quality of the service.
2.- Capacity for the elaboration, strategic planning, direction, coordination, and technical and economic management of projects in all areas of Computer Engineering following quality and environmental criteria.
3.- Capacity for general management, technical management, and management of research, development, and innovation projects, in companies and technology centers, in the field of Computer Engineering.
4.- Ability to start-up, direct, and manage the manufacturing processes of computer equipment, guaranteeing safety for people and goods, the final quality of the products, and their approval.
5.- Ability to apply the knowledge acquired and to solve problems in new or little-known environments within broader and multidisciplinary contexts, with the ability to integrate knowledge.
6.- Ability to understand the ethical responsibility and professional deontology of the activity of the profession of Computer Engineer.
7.- Ability to apply the principles of economics and human resource management and projects, as well as the legislation, regulation, and standardization of IT.
8.- Capacity for continuous, self-directed, and autonomous learning.

SPECIFIC COMPETENCIES:
1.- Ability to ensure, manage, audit, and certify the quality of developments, processes, systems, services, applications, and computer products.
2.- Ability to design, develop, manage, and evaluate certification and security guarantee mechanisms in the treatment and access to information in a local or distributed processing system.
3.- Ability to analyze the information needs that arise in an environment and carry out at all stages the process of building an information system.

DESCRIPTION OF CONTENTS: PROGRAMME

1.- ITIL oriented towards Certification as ITIL Foundations
1.1.- Introduction to ISO 20000, COBIT and CMMI regarding their relationship with ITIL and their complementarity
1.2.- ITIL v3 phases
1.3.- Processes of the 5 phases of ITIL v3

2.- Systems Engineering and Software Engineering
2.1.- Introduction to INCOSE and ISO / IEC / IEEE 15288: 2002. Processes and life cycle
2.2.- Introduction to ISO / IEC / IEEE 12207: 2017. Processes and Life Cycle
2.3.- Introduction to the existing alignment between ISO 12207 and ISO 15288

3.- Quality of the software product
3.1.- Introduction to ISO / IEC 25000 - SQuaRE (System and Software Quality Requirements and Evaluation)
3.2.- Quality model: system/software and data
3.3.- Quality measurement
3.4.- Quality of requirements
3.5.- Quality evaluation

4.- Quality management techniques
4.1.- Requirements Engineering
4.2.- Quality Metrics
4.3.- Quality Levels expected in a System/Software
4.4.- Validation and Verification of Software Systems (V&V)

LEARNING ACTIVITIES AND METHODOLOGY

FORMATION ACTIVITIES
1.- Theoretical class
2.- Practical classes
3.- Theoretical and practical classes
4.- Laboratory practices
5.- Tutorials
6.- Group work
7.- Individual student work
8.- Partial and final exams

TEACHING METHODOLOGIES
1.- Presentations in the theory class with computer and audiovisual media support, in which the main concepts of the subject are developed and the complementary bibliography is provided to aid the learning of the students.
2.- Critical reading of texts recommended by the teacher of the subject: Press articles, reports, manuals and/or academic articles, either for later discussion in class or to expand and consolidate the knowledge of the subject.
3.- Resolution of practical cases, problems, etc. raised by the teacher individually or in groups
4.- Exhibition and discussion in class, under the teacher's moderation of topics related to the content of the subject, as well as practical cases or antagonistic topics that enhance the capacities and abilities of the students.
5.- Preparation of works and reports individually or in groups

ASSESSMENT SYSTEM

SE1: Class participation and debates: 10%
SE2: Individual work + Continuous practical assessment work and application of the standards seen in the course: 50%
SE3: Final Exam: 40%

% end-of-term-examination:	40
% of continuous assessment (assigments, laboratory, practicals…):	60

BASIC BIBLIOGRAPHY

 - AXELOS ITIL® Practitioner Guidance, TSO (The Stationery Office), 2016

 - AXELOS ITIL 4 Managing Professional Package,   TSO (The Stationery Office), 2020

 - Farenden, Peter ITIL for Dummies, Wiley, 2012

 - Helen Morris Liz Gallacher ITIL foundation exam study guide , Wiley, 2012

 - IEEE ISO/IEC 12207 Standard for Information Technology - Software Life Cycle Processes, IEEE, 2017

 - INCOSE ISO15288, Wiley, 2012

 - Organizacio¿n Internacional De Normalizacio¿n, and Comisio¿n Electrote¿cnica Internacional ISO 25000 - Systems and Software Engineering -- Systems and Software Quality Requirements and Evaluation (SQuaRE), Organizacio¿n Internacional De Normalizacio¿n, and Comisio¿n Electrote¿cnica Internacional, 2014

 - Pamela Erskine ITIL and organizational change , Wiley, 2013

 - Parra, Eugenio, Christos Dimou, Juan Llorens, Valentín Moreno, and Anabel Fraga A Methodology for the Classification of Quality of Requirements Using Machine Learning Techniques, Information and Software Technology, 2015
 - itSMF ITIL Foundation Handbook, TSO (The Stationery Office), 2012