UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course: QUALITY OF SOFTWARE SYSTEMS
Code: 42331
Type: CORE COURSE
ECTS credits: 6
Degree: 347 - DEGREE PROGRAMME IN COMPUTER SCIENCE ENGINEERING (CR)
Academic year: 2021-22
Center: 108 - SCHOOL OF COMPUTER SCIENCE OF C. REAL
Group(s): 20
Year: 4
Duration: First semester
Main language: Spanish
Second language: Spanish
Use of additional languages:
English Friendly: Y
Web site:
Bilingual: N

Lecturer: **JESÚS RAMÓN OVIEDO LAMA** - Group(s): **20**

Building/Office	Department	Phone number	Email	Office hours
	TECNOLOGÍAS Y SISTEMAS DE INFORMACIÓN		Jesus.Oviedo@uclm.es	

Lecturer: **MARIO GERARDO PIATTINI VELTHUIS** - Group(s): **20**

Building/Office	Department	Phone number	Email	Office hours
Fermín Caballero / 3.29	TECNOLOGÍAS Y SISTEMAS DE INFORMACIÓN	3715	mario.piattini@uclm.es	

2. Pre-Requisites

This subject is based on the competences and knowledge acquired in the subjects:

- Information systems
- Software Engineering I
- Software Engineering II

3. Justification in the curriculum, relation to other subjects and to the profession

This subject is integrated into the Software Engineering Specific Technology curriculum, and presents students with an overview of the concept of "Quality" within the world of Software Engineering. The contents cover the models and quality standards that are used in any organization, as well as a collection of techniques and tools essential for quality management.

The main characteristics of the quality of computer systems are analyzed, with special emphasis on the quality of processes and software products as well as the quality of information and personnel.

The most important aspects of the measurement and improvement of software systems are also studied.

The purpose of this subject is to provide the student with the knowledge and skills necessary to improve the software systems he or she manages or develops. The knowledge acquired in this subject will facilitate the students the possibility to deepen in other aspects of the quality, such as the quality in services, the certification or the government of the information systems.

4. Degree competences achieved in this course

Course competences

Code	Description
INS01	Analysis, synthesis, and assessment skills.
INS02	Organising and planning skills.
INS03	Ability to manage information and data.
INS04	Problem solving skills by the application of engineering techniques.
INS05	Argumentative skills to logically justify and explain decisions and opinions.
IS01	Ability to develop, maintain, and assess services and software systems which could fulfil all the user's needs and which work in an efficient and reliable manner, having feasible development and maintenance, and which comply with quality regulations, applying theories, principles, methodologies, and practical customs of software engineering.
PER01	Team work abilities.
PER02	Ability to work in multidisciplinary teams.
PER04	Interpersonal relationship skills.
PER05	Acknowledgement of human diversity, equal rights, and cultural variety.
SIS01	Critical thinking.
SIS03	Autonomous learning.
SIS04	Adaptation to new scenarios.
SIS05	Creativity.
SIS06	Leadership skills.
SIS08	Initiative and entrepreneurial abilities.

SIS09 Care for quality.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Knowledge and understanding of the application of the main techniques to evaluate, validate, verify and improve software.

An ability to measure and evaluate software processes in order to improve them.

Knowledge of the main quality criteria, both of the processes and of the software products.

Know the main quality standards and norms, as well as tools for their management.

6. Units / Contents

Unit 1: Quality Concept

Unit 2: Quality Tools

Unit 3: Quality Standards and Models

Unit 4: Quality of Computer Systems

Unit 5: Software Product Quality Models

Unit 6: Process Quality

Unit 7: Software Life Cycle Process

Unit 8: Process Assement and Improvement

Unit 9: Computer Systems Measurement

Unit 10: People Quality

ADDITIONAL COMMENTS, REMARKS

Practice 1: Software quality measurement tools

Practice 2: Software Process Quality Assessment

Practice 3: Software Product Quality Assessment

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	INS01 INS02 INS04 INS05 IS01 SIS01 SIS09	0.6	15	N	-	Teaching of the subject matter by lecturer (MAG)
Individual tutoring sessions [ON-SITE]		INS01 INS02 INS04 INS05 IS01 SIS09	0.18	4.5	N	-	Individual or small group tutoring in lecturer¿s office, classroom or laboratory (TUT)
Study and Exam Preparation [OFF-SITE]	Self-study	INS01 INS02 INS04 INS05 IS01 SIS03 SIS08 SIS09	1.8	45	N	-	Self-study (EST)
Other off-site activity [OFF-SITE]	Practical or hands-on activities	INS01 INS02 INS03 INS04 INS05 IS01 PER01 PER02 PER04 PER05 SIS03 SIS04 SIS05 SIS06 SIS08 SIS09	0.9	22.5	N	-	Lab practical preparation (PLAB)
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	INS01 INS02 INS04 INS05 IS01 PER01 PER02 PER04 PER05 SIS04 SIS05 SIS06 SIS08 SIS09	0.6	15	Y	N	Worked example problems and cases resolution by the lecturer and the students (PRO)
Writing of reports or projects [OFF-SITE]	Self-study	INS01 INS02 INS04 INS05 IS01 PER01 PER02 PER04 PER05 SIS01 SIS03 SIS04 SIS05 SIS06 SIS08 SIS09	0.9	22.5	Y	N	Preparation of essays on topics proposed by lecturer (RES)
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	INS01 INS02 INS03 INS04 INS05 IS01 PER01 PER02 PER04 PER05 SIS04 SIS05 SIS06 SIS08 SIS09	0.72	18	Y	Y	Realization of practicals in laboratory /computing room (LAB)
Other on-site activities [ON-SITE]	Assessment tests	INS01 INS02 INS04 INS05 IS01	0.3	7.5	Y	Y	Final test of the complete syllabus of the subject (EVA)
		Total:	**6**	**150**			
		Total credits of in-class work: 2.4					**Total class time hours: 60**
		Total credits of out of class work: 3.6					**Total hours of out of class work: 90**

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Theoretical papers assessment	15.00%	15.00%	Non-compulsory activity that can be retaken. To be carried out before end of teaching period
			Compulsory activity that can be retaken. To be carried out

Practicum and practical activities reports assessment	30.00%	30.00%	during lab sessions
Assessment of active participation	15.00%	15.00%	Non-compulsory activity that can be retaken (rescheduling). To be carried out in the theory/laboratory sessions for the students of the continuous modality. The students of non-continuous modality will be evaluated of this activity through an alternative system in the ordinary call
Final test	40.00%	40.00%	Compulsory activity that can be retaken (rescheduling) to be carried out within the planned exam dates of the final exam call (convocatoria ordinaria).
Total:	**100.00%**	**100.00%**	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject , an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:

Continuous assessment:

In compulsory activities, a minimum mark of 40% is required in order to pass that activity and have the possibility to therefore pass the entire subject. The evaluation of the activities will be global and therefore must be quantified by means of a single mark. In the case of the activities that may be retaken (i.e., rescheduling), an alternative activity or test will be offered in the resit/retake exam call (convocatoria extraordinaria).

The final exam will be common for all the theory/laboratory groups of the subject and will be evaluated by the lecturers of the subject in a serial way, i.e., each part of the final exam will be evaluated by the same lecturer for all the students.

A student is considered to pass the subject if she/he obtains a minimum of 50 points out of 100, taking into account the points obtained in all the evaluable activities, and also has passed all the compulsory activities.

For students who do not pass the subject in the final exam call (convocatoria ordinaria), the marks of activities already passed will be conserved for the resit/retake examcall (convocatoria extraordinaria). If an activity is not recoverable, its assessment will be preserved for the resit/retake exam call (convocatoria extraordinaria) even if it has not been passed. In the case of the passed recoverable activities, the student will have the opportunity to receive an alternative evaluation of those activities in the resit/retake exam call and, in that case, the final grade of the activity will correspond to the latter grade obtained.

The mark of the passed activities in any call, except for the final exam, will be conserved for the subsequent academic year at the request of the student, provided that mark is equal or greater than 50% and that the activities and evaluation criteria of the subject remain unchanged prior to the beginning of that academic year.

The failure of a student to attend the final exam will automatically result in her/him receiving a "Failure to attend" (no presentado). If the student has not passed any compulsory evaluation activity, the maximum final grade will be 40%.

Non-continuous evaluation:

Students may apply at the beginning of the semester for the non-continuous assessment mode. In the same way, the student may change to the non-continuous evaluation mode as long as she/he has not participated during the teaching period in evaluable activities that together account for at least 50% of the total mark of the subject. If a student has reached this 50% of the total obtainable mark or the teaching period is over, she/he will be considered in continuous assessment without the possibility of changing to non-continuous evaluation mode.

Students who take the non-continuous evaluation mode will be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences), through the assessment systems indicated in the column "Non-continuous evaluation".

In the "non-continuous evaluation" mode, it is not compulsory to keep the mark obtained by the student in the activities or tests (progress test or partial test) taken in the continuous assessment mode.

Specifications for the resit/retake exam:

Evaluation tests will be conducted for all recoverable activities.

Specifications for the second resit / retake exam:

Same characteristics as the resit/retake exam call.

9. Assignments, course calendar and important dates

Not related to the syllabus/contents

Hours **hours**

General comments about the planning: The subject is taught in 3 x 1,5 hour sessions per week.

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	City	ISBN	Year	Description
Mario G. Piattini Velthuis, Félix Óscar García Rubio	Medición de Software	RA-MA		978-84-9964-850-7	2019	
Piattini Velthuis, Mario/ García Rubio, Félix Oscar/ García Rodríguez de Guzmán, Ignacio/ Pino, Francisco	Calidad de sistemas de información. 5ªEdición	RA-MA		978-84-9964-733-3	2020	
Piattini Velthuis, Mario/ Jadwiga Octaba, Hanna/ Orozco Mendoza, María Julia/ Alquicira Esquivel	COMPETISOFT: Mejora de Procesos Software para Pequeñas y Medianas Empresas y Proyectos	RA-MA		978-84-7897-901-1	2008	
Pino, F., Rodríguez, M., Piattini, M. y Fernández, C.M.	Modelo de madurez de ingeniería del software Versión 2.0 (MMIS V.2)	AENOR ediciones	madrid	978-84-8143-973-1	2018	
Pino, F., Pino, A., Caicedo, A. y	ISO/IEC 29110 para procesos software en las pequeñas	AENOR		978-84-8143-966-3	2018	