UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course: INGENIERÍA DEL SOFTWARE II
Type: CORE COURSE
Degree: 346 - DEGREE IN COMPUTER SCIENCE AND ENGINEERING
Center: 604 -
Year: 3
Main language: Spanish
Use of additional languages:
Web site:

Code: 42324
ECTS credits: 6
Academic year: 2019-20
Group(s): 10 11 12
Duration: First quarter
Second language: English
English Friendly: N
Bilingual: Y

Lecturer: **MARIA DE LOS LLANOS ALONSO DIAZ-MARTA** - Group(s): **10 11**

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Lecturer: **GREGORIO DIAZ DESCALZO** - Group(s): **10 11**

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2. Pre-Requisites

Students are required to have already passed Programming Fundamentals I and II, as well as Software Engineering I and Databases to have a minimum guarantee of passing this course. Those students who haven't already passed these courses and are interesting in getting enrolled in Software Engineering II, should make a major effort to acquire the necessary knowledge and experience of software design and databases.

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

This subject pretends to offer a big picture of the Software Engineering processes and their relations to create work teams that develop information systems industrializing such processes, highlighting that this development is always cooperative and multidisciplinary.

For this aim, the subject introduces the concept of Software Lifecycle and describes a map of the processes necessary to develop software with a work team, explaining its enactment when different software development methodologies are used. Moreover, different important process are presented such as configuration management, quality management, testing management and maintenance management.

As result, it is expected that the student will be able to achieve the abilities and knowledge necessary to work as Software Engineer.

Moreover, it is important to highlight that this subject belong to the module of Software Engineering, Information Systems and Intelligent Systems of the curriculum and provides the basis for the subjects of the specialty of Software Engineering:

- Requirements Engineering

- Software Design

- Process of Software Engineering

- Quality of Software Engineering

- Software Project Management

- Databases Development

- Enterprise Information Systems

- Security of Software Systems

4. Degree competences achieved in this course

Course competences

Code	Description
CO1	Ability to design, develop, select, and assess, applications and digital systems, guaranteeing their reliability, security, and quality, according to ethical principles and the current and common laws.
CO16	Knowledge and application of principles, methodologies, and life spans of software engineering.
CO2	Ability to conceive, plan, develop and manage projects, services, and digital systems in any context, leading their start and applying continuous improvements, assessing their economic and social impact.
	Ability to understand the important of negotiation, work efficiency, leadership, and communication abilities in every context of software

CO3	development.
CO5	Knowledge, administration, and maintenance of systems, services and digital systems.
CO8	Ability to analyse, design, build and maintain applications in a strong, safe, and efficient manner by selecting the most appropriate paradigms and programming languages.
PER1	Team work abilities.
SIS4	Adaptation to new scenarios.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Knowledge about tools that support the construction of software systems and the storage and processing of data.

Knowledge and application of different types of software life cycle models.

Knowledge and use of the technologies that support the construction and use of information systems.

Consideration of the aspects of quality in software development such as usability, accessibility, security, reliability, etc.

Implementation and maintenance of applications according to the analysis and design activities previously carried out.

Additional outcomes

6. Units / Contents

Unit 1: Configuration Management

Unit 2: Software Testing: Introduction and Foundations

Unit 3: Software Testing: Strategies and Processes

Unit 4: Software Quality

Unit 5: Software maintenance

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences	ECTS	Hours	As	Com	R	Description
Class Attendance (theory) [ON-SITE]	Lectures	CO2 CO5 CO8	0.74	18.5	N	-	-	Lectures will be provided about the different topics of the subject. This is an individual activity.
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	CO2 CO8 PER1 SIS4	0.16	4	Y	N	N	Collaborative problem solving. Group Activity.
Workshops or seminars [ON-SITE]	Workshops and Seminars	CO2 CO3 CO8 PER1	0.54	13.5	Y	N	N	Seminars about the tools to be used during the laboratory session, explaining their relationship with theoretical concepts. An assessment of the theoretical and practical ideas explained will be carried out.
Practicum and practical activities report writing or preparation [OFF-SITE]	Other Methodologies	CO2 CO3 CO8 PER1	0.24	6	Y	N	N	Autonomous activity to assess some theoretical concepts.
Study and Exam Preparation [OFF-SITE]	Other Methodologies	CO2 CO8	1.28	32	Y	N	N	Autonomous activity to study and understand the topics presented in the subject.
Laboratory practice or sessions [ON-SITE]	Group Work	CO1 CO16 CO2 CO3 CO8 PER1 SIS4	0.72	18	N	-	-	Team activity to carry out the lab assignements as both autonomous and tutorized work. As far as possible, it would be coordinated with the assignements of the Project Management subject.
Laboratory practice or sessions [ON-SITE]	Assessment tests	CO2 CO3 CO8 PER1 SIS4	0.05	1.25	Y	Y	Y	Assesment of the lab assignments considering both team and individual work.
Writing of reports or projects [OFF-SITE]	Cooperative / Collaborative Learning	CO1 CO16 CO2 CO3 CO8 PER1	2.08	52	Y	Y	Y	Team work to carry out reports, models, implementation, etc required for the lab assignaments.
Other on-site activities [ON-SITE]	Assessment tests	CO2 CO8	0.08	2	Y	N	N	Evaluation of the student's progress by means of writing tests.
Final test [ON-SITE]	Assessment tests	CO2 CO8	0.11	2.75	Y	Y	Y	Final exam carried out by the student.
		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
R: Rescheduling training activity

8. Evaluation criteria and Grading System

	Grading System	

Evaluation System	Face-to-Face	Self-Study Student	Description
Assessment of active participation	10.00%	0.00%	The different activities related to the theoretical content of the subject presented in the seminars will be evaluated [PRES].
Laboratory sessions	45.00%	0.00%	The lab assignements will be carried out as teamwork of 4 four students and will have 3 evaluations, carried out during the semester. To pass this part of the subject the score of the team will have to satisfy the following requirement: - The score obtained by each member of the team will be higher or equal than 5 for the three evaluations. If the student fails any evaluation, then the student will fail the ordinary evaluation and will have to retake the lab assignements by the end of February. To determine the student's score it will be considered both the individual and team work. For the teamwork, it will be considered the involvement and performance of the student regarding his peers For the assesment, teachers will ask directly to any team member and will consider both the work carried out in the lab [LAB] (22,5%) and the reports required [INF] (22,5%). Moreover, competences CO2, CO3, CO8, PER1, SIS4. will be also assessed.
Test	22.50%	0.00%	A mid-term exam will be carried out [ESC]. Students whose score of this exam be higher or equal than 5, will not be evaluated of topics 1 and 2 in the final exam. Moreover, competences CO2 and CO8 will be also evaluated.
Final test	22.50%	0.00%	A final exam [ESC] will be carried out to evaluate both theoretical and practical contents. If this exam is not passed, then the student will automatically fail the subject. Moreover, competences CO2 and CO8 will be also evaluated.
Other methods of assessment	10.00%	0.00%	[Optional] Teams participating in international contests, such as Imagine CUP, as result of their work in the subject may obtain 1 additional point. Such point will be obtained provided the team has really submitted its work achieving certain quality levels, once it has been approved by the teacher, and having a final score higher or equal than 5.
Theoretical papers assessment	10.00%	0.00%	[Optional] Those students interested in carrying out a theoretical/practical report related to a topic of the subject, may obtain till 1 additional point once it has been approved by the teacher.
Total:	**120.00%**	**0.00%**	

Evaluation criteria for the final exam:

In order to pass this subject, the student will be required a minimum pass grade of 5, satisfying the following criteria:
- Theory [ESC]: 2,25 out of 4,5. The grade of theory will be calculated as: (Final term exam * 0. 225) + (test *0.225) if the student has passed both the test and the final term exam. If the student has failed the test but has passed the final term exam, then the grade of theory will be calculated as: (Final term exam * 0.45).
- Laboratory [INF][LAB]: 2,25 out of 4,5. The grade of Laboratory will be kept for future assessments if the student has a grade of Laboratory higher or equal than 2.25 (out of 4.5).

Final score will be computed as:
Final= Theory+Laboratory+Classroom activities

being compulsory that both Theory and Laboratory be higher or equal to 2.25 out of 4.5. Otherwise, Final would be the highest of them.

Specifications for the resit/retake exam:

In order to pass this subject, the student will be required a minimum pass grade of 5, satisfying the following criteria:
- Theory [ESC]: 2,25 out of 4,5. The grade of theory will be calculated as: (Final term exam * 0. 225) + (test *0.225) if the student has passed both the test and the final term exam. If the student has failed the test but has passed the final term exam, then the grade of theory will be calculated as: (Final term exam * 0.45).
- Laboratory [INF][LAB]: 2,25 out of 4,5. The grade of Laboratory will be kept for future assessments if the student has a grade of Laboratory higher or equal than 2.25 (out of 4.5).

Final score will be computed as:
Final= Theory+Laboratory+Classroom activities

being compulsory that both Theory and Laboratory be higher or equal to 2.25 out of 4.5. Otherwise, Final would be the highest of them.

Specifications for the second resit / retake exam:

In order to pass this subject, the student will be required a minimum pass grade of 5, satisfying the following criteria:
- Theory [ESC]: 2,25 out of 4,5. The grade of theory will be calculated as: (Final term exam * 0. 225) + (test *0.225) if the student has passed both the test and the final term exam. If the student has failed the test but has passed the final term exam, then the grade of theory will be calculated as: (Final term exam * 0.45).
- Laboratory [INF][LAB]: 2,25 out of 4,5. The grade of Laboratory will be kept for future assessments if the student has a grade of Laboratory higher or equal than 2.25 (out of 4.5).

Final score will be computed as:
Final= Theory+Laboratory+Classroom activities

being compulsory that both Theory and Laboratory be higher or equal to 2.25 out of 4.5. Otherwise, Final would be the highest of them.

9. Assignments, course calendar and important dates

Not related to the syllabus/contents	
Hours	**hours**
Laboratory practice or sessions [PRESENCIAL][Group Work]	18
Laboratory practice or sessions [PRESENCIAL][Assessment tests]	1.25
Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning]	52
Other on-site activities [PRESENCIAL][Assessment tests]	2
Final test [PRESENCIAL][Assessment tests]	2.75

General comments about the planning: Lectures are offered in three different sessions of 1.5 hours each one. This course schedule is APPROXIMATE. It could vary throughout the academic course due to teaching needs, bank holidays, etc. A weekly schedule will be properly detailed and updated on the online platform (Campus Virtual). Note that all the lectures, lab sessions, exams and related activities performed in the bilingual groups will be entirely taught in English. Every week three hours will be devoted to activities in the classroom. Evaluations or classes may be retaken in the afternoon.

Unit 1 (de 5): Configuration Management	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3.75
Workshops or seminars [PRESENCIAL][Workshops and Seminars]	5.5
Practicum and practical activities report writing or preparation [AUTÓNOMA][Other Methodologies]	1
Study and Exam Preparation [AUTÓNOMA][Other Methodologies]	7
Teaching period: Week 1-5	

Unit 2 (de 5): Software Testing: Introduction and Foundations	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3.75
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	3
Workshops or seminars [PRESENCIAL][Workshops and Seminars]	4
Practicum and practical activities report writing or preparation [AUTÓNOMA][Other Methodologies]	4
Study and Exam Preparation [AUTÓNOMA][Other Methodologies]	8
Teaching period: Week 6-7	

Unit 3 (de 5): Software Testing: Strategies and Processes	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1
Workshops or seminars [PRESENCIAL][Workshops and Seminars]	2
Study and Exam Preparation [AUTÓNOMA][Other Methodologies]	5
Teaching period: Week 8-11	

Unit 4 (de 5): Software Quality	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1
Practicum and practical activities report writing or preparation [AUTÓNOMA][Other Methodologies]	1
Study and Exam Preparation [AUTÓNOMA][Other Methodologies]	6
Teaching period: Week 12-13	

Unit 5 (de 5): Software maintenance	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Workshops or seminars [PRESENCIAL][Workshops and Seminars]	2
Study and Exam Preparation [AUTÓNOMA][Other Methodologies]	6
Teaching period: Week 14	

Global activity	
Activities	**hours**
Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning]	52
Other on-site activities [PRESENCIAL][Assessment tests]	2
Final test [PRESENCIAL][Assessment tests]	2.75
Class Attendance (theory) [PRESENCIAL][Lectures]	17.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	5
Workshops or seminars [PRESENCIAL][Workshops and Seminars]	13.5
Practicum and practical activities report writing or preparation [AUTÓNOMA][Other Methodologies]	6
Study and Exam Preparation [AUTÓNOMA][Other Methodologies]	32
Laboratory practice or sessions [PRESENCIAL][Group Work]	18
Laboratory practice or sessions [PRESENCIAL][Assessment tests]	1.25
Total horas:	150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Gene Kin, Jon Willis y Patrick Debois	The DevOPS Handbook: How to Create World-Class Agility, Reliability, and Security in Technology Organizations	IT Revolution Press		1942788002	2016	
Martin Fowler	Refactoring: Improving the Design of Existing Code	Addison-wesley Signature Series		0134757599	2019	
	https://www.amazon.es/Refactoring-Improving-Existing-Addison-wesley-Signature/dp/0134757599/ref=pd_sbs_14_3/258-					

	5282820-5366216?_encoding=UTF8&pd_rd_i=0134757599&pd_rd_r=264d348c-9cb8-11e9-b1eb-4784b345ea18&pd_rd_w=mKtlP&pd_rd_wg=u0vFC&pf_rd_p=f9384d3f-fa3d-4e25-8bc3-b0c7853cd8a6&pf_rd_r=DC4V1QAB3W2FV9BJQ6MD&psc=1&refRID=DC4V1QAB3W2FV9BJQ6MD				
Jez Humble y David Farley	Continuous Delivery: Reliable Software Releases through Build, Test, and Deployment Automation	Addison Wesley Signature Series	9780321601919	2010	
	https://www.amazon.es/Continuous-Delivery-Deployment-Automation-Addison-Wesley/dp/0321601912/ref=pd_bxgy_14_img_3/258-5282820-5366216?_encoding=UTF8&pd_rd_i=0321601912&pd_rd_r=169b1b58-9cb8-11e9-bafd-45911e5c33eb&pd_rd_w=P4hUD&pd_rd_wg=Lo8eF&pf_rd_p=7b8b17e5-e2e0-413e-bf77-272aa9f4139c&pf_rd_r=938A3TQQ9X0J7GC6WDH6&psc=1&refRID=938A3TQQ9X0J7GC6WDH6				
COLLARD, J.F. BURNSTEIN, I.	Practical Software Testing: A Process-Oriented Approach	Springer	0387951318	2003	Pruebas
GALIN, D.	Software Quality Assurance: From theory to implementation	Addison-Wesley	9780201709452	2003	Calidad
KAN, S.H.	Metrics and Models in Software Quality Engineering	Addison-Wesley	0201633396	1995	Calidad
KANER, C., NGUYEN, H.Q., FALK, J.	Testing Computer Software	John Wiley & Sons	1850328471	1999	Pruebas
LEON, A.	Software Configuration Management Handbook	Artech House	1580530729	2005	Gestión de Configuración
PIGOSKI, T.M.	Practical Software Maintenance	John Wiley & Sons	0471170011	1997	Mantenimiento
BROWN, W.J., MCCORMICK, H.W., THOMAS, S.W.	AntiPatterns: refactoring software, architectures and projects in crisis	John Wiley and Sons	0471197130	1998	Mantenimiento