

**1. General information****Course:** SOFTWARE ENGINEERING I**Type:** CORE COURSE**Degree:** 405 - DEGREE IN COMPUTER SCIENCE ENGINEERING (TA)**Center:** 15 - FACULTY OF SOCIAL SCIENCES AND INFORMATION TECHNOLOGIES**Year:** 2**Main language:** Spanish**Use of additional languages:****Web site:****Code:** 42314**ECTS credits:** 6**Academic year:** 2021-22**Group(s):** 60**Duration:** First semester**Second language:** English**English Friendly:** Y**Bilingual:** N**Lecturer:** RICARDO PÉREZ DEL CASTILLO - Group(s): 60

| Building/Office | Department                            | Phone number | Email                        | Office hours |
|-----------------|---------------------------------------|--------------|------------------------------|--------------|
| 2.11            | TECNOLOGÍAS Y SISTEMAS DE INFORMACIÓN | +34926051816 | Ricardo.PdelCastillo@uclm.es |              |

**2. Pre-Requisites**

Not established

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

This course provides an overview of Software Engineering and the role it plays in the context of Computer Engineering. For this, the basic concepts and the main characteristics and techniques to be applied in the software development stages are presented: requirements, analysis, design and implementation. For this, the Object Orientation paradigm will be adopted.

As a result, it is expected to train the student with the basic skills and knowledge necessary to work as a Software Engineer. This will provide the necessary basis to deepen specific subjects in Software Engineering that can be taken throughout the career.

**4. Degree competences achieved in this course****Course competences**

| Code   | Description   |
|--------|---|
| BA04   | Basic knowledge about the uses and programming of computers, operating systems, data bases, and digital programmes with applications in engineering.  |
| CO01   | 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.   |
| CO02   | 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. |
| CO03   | Ability to understand the important of negotiation, work efficiency, leadership, and communication abilities in every context of software development.  |
| CO08   | Ability to analyse, design, build and maintain applications in a strong, safe, and efficient manner by selecting the most appropriate paradigms and programming languages.                                  |
| CO16   | Knowledge and application of principles, methodologies, and life spans of software engineering.   |
| INS01  | Analysis, synthesis, and assessment 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.   |
| PER01  | Team work abilities.  |
| SIS01  | Critical thinking.  |
| SIS03  | Autonomous learning.  |
| SIS04  | Adaptation to new scenarios.  |
| SIS05  | Creativity.   |
| SIS09  | Care for quality.   |
| UCLM02 | Ability to use Information and Communication Technologies.  |

**5. Objectives or Learning Outcomes****Course learning outcomes****Description**

Knowledge of the principles of software engineering and the main methodologies for the construction of quality software.

Identification, modelling, and specifications of software and business requirements for the construction of software systems that implement them.

Building design models, both high leveled and detailed, for the construction of software systems that implement them.

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

**6. Units / Contents**

Unit 1: Introduction to Software Engineering  
Unit 2: Launching Software Development Project  
Unit 3: Object Oriented Software Development  
Unit 4: Requirement Analysis  
Unit 5: Design  
Unit 6: Implementation

#### ADDITIONAL COMMENTS, REMARKS

Lab practices:

- Practice 1: JDBC and Database access
- Practice 2: Object Orientation, Visual Paradigm and Multilayer Architecture
- Practice 3: Use Case Diagrams
- Practice 4: Class Diagrams
- Practice 5: Interaction Diagrams
- Practice 6: State Transition Diagrams
- Practice 7: Deployment Diagrams

#### 7. Activities, Units/Modules and Methodology

| Training Activity                              | Methodology   | Related Competences<br>(only degrees before RD 822/2021)                               | ECTS  | Hours      | As | Com | Description |
|--|---|--|---|------------|----|-----|-------------|
| Class Attendance (theory) [ON-SITE]            | Lectures  | BA04 CO01 CO02 CO03<br>CO08 CO16 SIS01 SIS09   | 0.72  | 18         | N  | -   |             |
| Individual tutoring sessions [ON-SITE]         | Collaborative on line international learning (COIL) | BA04 CO01 CO02 CO03<br>CO08 CO16 UCLM02  | 0.18  | 4.5        | N  | -   |             |
| Study and Exam Preparation [OFF-SITE]          | Self-study  | BA04 CO01 CO02 CO03<br>CO08 SIS01 SIS09<br>UCLM02                                      | 2.1   | 52.5       | N  | -   |             |
| Other off-site activity [OFF-SITE]             | Practical or hands-on activities                    | BA04 CO01 CO02 CO03<br>CO08 INS03 INS04 INS05<br>PER01 SIS03 SIS04 SIS05<br>UCLM02     | 0.6   | 15         | N  | -   |             |
| Problem solving and/or case studies [ON-SITE]  | Problem solving and exercises                       | BA04 CO01 CO02 CO03<br>CO08 INS01 INS04 PER01<br>SIS03 SIS09                           | 0.6   | 15         | Y  | N   |             |
| Writing of reports or projects [OFF-SITE]      | project-based learning                              | BA04 CO01 CO02 CO03<br>CO08 CO16 INS01 INS04<br>INS05 PER01 SIS03 SIS04<br>SIS05       | 0.9   | 22.5       | Y  | N   |             |
| Laboratory practice or sessions [ON-SITE]      | Practical or hands-on activities                    | BA04 CO01 CO02 CO03<br>CO08 CO16 INS01 INS03<br>INS04 INS05 PER01 SIS03<br>SIS04 SIS05 | 0.6   | 15         | Y  | Y   |             |
| Other on-site activities [ON-SITE]             | Assessment tests                                    | BA04 CO01 CO02 CO03<br>CO08 INS03 INS04 INS05<br>PER01 SIS03 SIS04 SIS05<br>UCLM02     | 0.15  | 3.75       | Y  | Y   |             |
| Other on-site activities [ON-SITE]             | Assessment tests                                    | BA04 CO01 CO02 CO03<br>CO08 INS03 INS04 INS05<br>PER01 SIS03 SIS04 SIS05<br>UCLM02     | 0.15  | 3.75       | Y  | Y   |             |
| <b>Total:</b>                                  |   |  | <b>6</b>                                    | <b>150</b> |    |     |             |
| <b>Total credits of in-class work: 2.4</b>     |   |  | <b>Total class time hours: 60</b>           |            |    |     |             |
| <b>Total credits of out of class work: 3.6</b> |   |  | <b>Total hours of out of class work: 90</b> |            |    |     |             |

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   |
|---------------------|-----------------------|----------------------------|---|
| Test                | 25.00%                | 25.00%                     | Partial Test 1. Compulsory activity that can be retaken (rescheduling). To be carried out at the end of the first half of the teaching period.  |
| Test                | 25.00%                | 25.00%                     | Partial Test 2. Compulsory activity that can be retaken. To be carried out within the planned dates of the final exam call. The Partial Test 1 retake will be performed at this date. |
| Laboratory sessions | 25.00%                | 25.00%                     | Compulsory activity that can be retaken. To be carried out during lab sessions.   |

|                                    |                |               |   |
|------------------------------------|----------------|---------------|---|
| Assessment of active participation | 10.00%         | 0.00%         | Non-compulsory activity that can be retaken. To be carried out during the theory/lab sessions in continuous modality. Non-continuous students will be evaluated for this activity through an alternative system in the ordinary call. |
| Theoretical papers assessment      | 15.00%         | 15.00%        | Elaboration in group of a theoretical paper. Non-compulsory activity that cannot be retaken. To be carried out before end of teaching period  |
| <b>Total:</b>                      | <b>100.00%</b> | <b>90.00%</b> |   |

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. If the activity consists of several sections, each section may be evaluated separately provided students are informed in writing of this evaluation criterion at the beginning of the academic year. 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 partial tests 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 exam call (convocatoria extraordinaria). 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 qualification of the passed activities in any call, except for the partial tests, will be conserved for the next academic year at the request of the student, provided that it is equal or superior to 5 and the training activities and the evaluation criteria of the subject are not modified in the next academic year.

The failure of a student to attend the partial 1 and partial 2 tests 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 who are unable to attend training activities on a regular basis may apply at the beginning of the semester for the non-continuous assessment mode. Similarly, if a student who is undergoing continuous assessment incurs any circumstance that prevents her/him from regularly attending the classroom-based training activities, she/he may renounce the accumulated mark in continuous assessment and apply for the non-continuous assessment mode. In this case, a notification by the student must be given before the date scheduled for the tests in the ordinary call, in accordance with a deadline that will be informed at the beginning of the semester.

Students who take the non-continuous assessment 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 assessment".

In the "non-continuous assessment" 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 |
| <b>General comments about the planning:</b> The subject is taught in 3 x 1,5 hour sessions per week. The planning can be modified in the event of unforeseen causes. |       |

| 10. Bibliography and Sources                                 |   |                  |      |                   |      |             |
|--|---|------------------|------|-------------------|------|-------------|
| Author(s)  | Title/Link  | Publishing house | Citv | ISBN              | Year | Description |
| Piattini, M., Calvo-Manzano, J., Cervera, J. y Fernández, L. | Análisis y diseño de Aplicaciones Informáticas de Gestión. Una perspectiva de Ingeniería del Software   | Ra-Ma            |      | 847897587X        | 2003 |             |
| Pressman, Roger S.   | Ingeniería del software : un enfoque práctico<br><a href="https://catalogobiblioteca.uclm.es/cgi-bin/abnetopac/O7757/ID7fddc513?ACC=161">https://catalogobiblioteca.uclm.es/cgi-bin/abnetopac/O7757/ID7fddc513?ACC=161</a>      | McGraw-Hill      |      | 978-607-15-0314-5 | 2010 |             |
| Arlow, Jim; Neustadt, Ila                                    | UML 2 and the Unified Process: Practical Object-Oriented Analysis and Design  | Addison-Wesley   |      | 0321321278        | 2005 |             |
| Grady Booch, James Rumbaugh, Ivar Jacobson                   | El lenguaje unificado de modelado, guía de usuario<br><a href="https://catalogobiblioteca.uclm.es/cgi-bin/abnetopac/O7049/IDa3e0cda5?ACC=161">https://catalogobiblioteca.uclm.es/cgi-bin/abnetopac/O7049/IDa3e0cda5?ACC=161</a> | Addison-Wesley   |      | 84-7829-076-1     | 2010 |             |