



POLITÉCNICA

INTERNATIONAL
CAMPUS OF
EXCELLENCE

COORDINATION PROCESS OF
LEARNING ACTIVITIES
PR/CL/001



E.T.S. de Ingenieros
Informáticos

ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

103000933 - Requirements Engineering

DEGREE PROGRAMME

10AZ - Master Universitario En Innovación Digital

ACADEMIC YEAR & SEMESTER

2022/23 - Semester 1

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1. Description

1.1. Subject details

Name of the subject	103000933 - Requirements Engineering
No of credits	6 ECTS
Type	Optional
Academic year of the programme	First year
Semester of tuition	Semester 1
Tuition period	September-January
Tuition languages	English
Degree programme	10AZ - Master Universitario en Innovación Digital
Centre	10 - Escuela Tecnica Superior De Ingenieros Informaticos
Academic year	2022-23

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Oscar Dieste Tubio (Subject coordinator)	D5106	oscar.dieste@upm.es	Sin horario. Please check office hours in the "Course information section" at Moodle.
Natalia Juristo Juzgado	D5104	natalia.juristo@upm.es	Sin horario. Please check office hours in the "Course information section" at Moodle.

* The tutoring schedule is indicative and subject to possible changes. Please check tutoring times with the faculty member in charge.

3. Skills and learning outcomes *

3.1. Skills to be learned

CB07 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio

CB09 - Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades

CE-DM04 - Capacidad para analizar las necesidades que se plantean en un entorno industrial para su transformación digital

3.2. Learning outcomes

RA127 - The students will be able to analyze, specify and validate software requirements

RA128 - The students will be able to manage and negotiate requirements with project stakeholders

RA129 - The students will be able to elicit and conceptualize customer and user's needs

* The Learning Guides should reflect the Skills and Learning Outcomes in the same way as indicated in the Degree Verification Memory. For this reason, they have not been translated into English and appear in Spanish.

4. Brief description of the subject and syllabus

4.1. Brief description of the subject

The requirements engineering course aims to teach or expand students' abilities regarding software requirements: elicitation, analysis, documentation, validation and management. The course will balance lectures and practical activities. Special attention will be paid to tool support. Whenever possible, professional from industry will deliver keynotes about specific requirements engineering topics.

4.2. Syllabus

1. Requirements engineering processes
2. Requirements elicitation
3. Requirements analysis
4. Requirements documentation
5. Requirements validation
6. Requirements management/release planning

5. Schedule

5.1. Subject schedule*

Week	Classroom activities	Laboratory activities	Distant / On-line	Assessment activities
1	<p>Requirements engineering process (including agile approaches) Duration: 00:30</p> <p>Course goals and methodology Duration: 00:10</p> <p>Software project proposal Duration: 00:10</p> <p>Term paper proposal Duration: 00:10</p>	<p>Requirement types Duration: 02:00</p>		<p>Identifying software requirements for an existing software application</p> <p>Continuous assessment Not Presential Duration: 02:00</p>
2	<p>Software requirements specification Duration: 01:00</p> <p>Software requirements attributes (and relationship with Management) Duration: 00:30</p>	<p>Tool support for requirements specification: Rational Requisite Pro Duration: 01:30</p>		<p>Creation a requirement specification using Requisite Pro</p> <p>Continuous assessment Not Presential Duration: 03:00</p>
3	<p>Requirements validation Duration: 00:40</p> <p>Requirements reviews Duration: 00:20</p>	<p>Conduct a requirements review Duration: 00:45</p> <p>Apply validation approaches (user manual, requirements testing) Duration: 01:15</p>		<p>Software project proposal</p> <p>Continuous assessment Not Presential Duration: 03:00</p> <p>Report the validation exercises</p> <p>Continuous assessment Not Presential Duration: 01:00</p>
4	<p>Requirements elicitation Duration: 00:20</p> <p>Elicitation with interviews Duration: 00:40</p>	<p>PROJECT: Conduct the elicitation of a software project using interviews Duration: 01:30</p>		<p>Midterm exam</p> <p>Continuous assessment Presential Duration: 00:30</p> <p>Add elicitation information to DOORS</p> <p>Continuous assessment Not Presential Duration: 04:00</p>

5	<p>Analysis: Overview Duration: 00:20</p> <p>Analysis: Weak techniques Duration: 00:20</p> <p>Analysis: Low-fidelity prototypes Duration: 00:20</p>	<p>Perform a checklist-based analysis Duration: 00:30</p> <p>Conduct a low-fidelity prototype evaluation Duration: 00:30</p> <p>Tool support for requirements projects: IBM Doors Next Generation Duration: 01:00</p>		<p>Perform checklist-based analysis using DOORS</p> <p>Continuous assessment Not Presential Duration: 02:00</p>
6		<p>Elicitation: Other techniques, e.g., brainstorming, quizzes, etc. Duration: 02:00</p> <p>PROJECT: Conduct the evaluation of the project's low-fidelity prototype Duration: 01:00</p>		<p>Report the prototype evaluation exercise</p> <p>Continuous assessment Not Presential Duration: 02:00</p> <p>Add elicitation information to DOORS</p> <p>Continuous assessment Not Presential Duration: 01:00</p>
7		<p>PROJECT: Conduct the elicitation of a software project using interviews Duration: 02:00</p>		<p>Add elicitation information to DOORS</p> <p>Continuous assessment Not Presential Duration: 02:00</p>
8	<p>Elicitation: Requirements workshops and focus groups Duration: 01:00</p>	<p>PROJECT: Conduct the elicitation of a software project using a requirements workshop Duration: 02:00</p>		<p>Add elicitation information to DOORS</p> <p>Continuous assessment Not Presential Duration: 02:00</p> <p>Creation a preliminary requirement specification using DOORS</p> <p>Continuous assessment Not Presential Duration: 04:00</p>
9	<p>Analysis: Conceptual models Duration: 01:00</p>	<p>PROJECT: Create models for the different product perspectives (and enter them in DOORS) Duration: 02:00</p>		<p>Report the conceptual models and the cross-checks</p> <p>Continuous assessment Not Presential Duration: 02:00</p> <p>Creation the final version of the requirement specification using DOORS</p> <p>Continuous assessment Not Presential Duration: 01:00</p> <p>Conduct the review of the project's software requirements specification</p> <p>Continuous assessment Not Presential Duration: 03:00</p>

10	<p>Validation: Higher-fidelity prototypes Duration: 00:30</p>	<p>Early estimation Duration: 02:00</p>		<p>Perform the peer-evaluation of the software requirements specification</p> <p>Continuous assessment Not Presential Duration: 05:00</p> <p>Midterm exam</p> <p>Continuous assessment Presential Duration: 00:30</p>
11	<p>Requirements management Duration: 00:30</p> <p>Requirements prioritization Duration: 00:30</p> <p>Negotiation Duration: 01:00</p>	<p>Perform a change management process Duration: 01:00</p>		<p>Report the change management process</p> <p>Continuous assessment Not Presential Duration: 01:00</p>
12	<p>Triage and release planning Duration: 01:00</p>	<p>Perform a triage process Duration: 02:00</p>		<p>Report the triage process</p> <p>Continuous assessment Not Presential Duration: 01:00</p>
13	<p>Keynote: Practical experiences managing requirements Duration: 01:00</p>	<p>Human aspects in Requirements Engineering Duration: 02:00</p>		<p>Term paper submission</p> <p>Continuous assessment Not Presential Duration: 15:00</p>
14	<p>Project: Retrospective Duration: 01:00</p>	<p>Seminar: Model checking Duration: 03:00</p>		<p>Midterm exam</p> <p>Continuous assessment Presential Duration: 01:00</p> <p>Term paper presentation submission</p> <p>Continuous assessment Not Presential Duration: 01:30</p>
15		<p>Seminar: Model-driven engineering Duration: 03:00</p>		<p>Development of a simple application using MDA</p> <p>Continuous assessment Not Presential Duration: 04:00</p>
16	<p>Keynote: Artefact-driven Requirements Engineering Duration: 02:00</p>			<p>Term paper evaluation</p> <p>Continuous assessment Not Presential Duration: 02:00</p>

17				Global evaluation exam Final examination Presential Duration: 02:00
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Depending on the programme study plan, total values will be calculated according to the ECTS credit unit as 26/27 hours of student face-to-face contact and independent study time.

* The schedule is based on an a priori planning of the subject; it might be modified during the academic year, especially considering the COVID19 evolution.

6. Activities and assessment criteria

6.1. Assessment activities

6.1.1. Assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
1	Identifying software requirements for an existing software application		No Presential	02:00	3%	3 / 10	CE-DM04 CB07
2	Creation a requirement specification using Requisite Pro		No Presential	03:00	4%	3 / 10	CE-DM04
3	Software project proposal		No Presential	03:00	2%	3 / 10	CB07 CE-DM04 CB09
3	Report the validation exercises		No Presential	01:00	3%	3 / 10	CE-DM04
4	Midterm exam		Face-to-face	00:30	10%	5 / 10	CE-DM04
4	Add elicitation information to DOORS		No Presential	04:00	3%	3 / 10	CE-DM04
5	Perform checklist-based analysis using DOORS		No Presential	02:00	2%	3 / 10	CE-DM04
6	Report the prototype evaluation exercise		No Presential	02:00	3%	3 / 10	CE-DM04 CB09
6	Add elicitation information to DOORS		No Presential	01:00	1%	3 / 10	CE-DM04
7	Add elicitation information to DOORS		No Presential	02:00	2%	3 / 10	CE-DM04
8	Add elicitation information to DOORS		No Presential	02:00	2%	3 / 10	CE-DM04
8	Creation a preliminary requirement specification using DOORS		No Presential	04:00	4%	3 / 10	CE-DM04
9	Report the conceptual models and the cross-checks		No Presential	02:00	3%	3 / 10	CE-DM04 CB09
9	Creation the final version of the requirement specification using DOORS		No Presential	01:00	1%	3 / 10	CE-DM04
9	Conduct the review of the project's software requirements specification		No Presential	03:00	5%	3 / 10	CE-DM04 CB07 CB09

10	Perform the peer-evaluation of the software requirements specification		No Presential	05:00	10%	3 / 10	CE-DM04 CB07 CB09
10	Midterm exam		Face-to-face	00:30	10%	5 / 10	CE-DM04
11	Report the change management process		No Presential	01:00	2%	3 / 10	CE-DM04 CB09
12	Report the triage process		No Presential	01:00	3%	3 / 10	CE-DM04 CB09
13	Term paper submission		No Presential	15:00	5%	0 / 10	CE-DM04 CB07 CB09
14	Midterm exam		Face-to-face	01:00	10%	5 / 10	CE-DM04
14	Term paper presentation submission		No Presential	01:30	2%	0 / 10	CE-DM04 CB07 CB09
15	Development of a simple application using MDA		No Presential	04:00	5%	3 / 10	CE-DM04
16	Term paper evaluation		No Presential	02:00	5%	0 / 10	CB09 CE-DM04 CB07

6.1.2. Global examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
17	Global evaluation exam		Face-to-face	02:00	100%	5 / 10	CB07 CB09 CE-DM04

6.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
Final exam (extraordinary session)		Face-to-face	04:00	100%	5 / 10	CE-DM04 CB07 CB09

6.2. Assessment criteria

Progressive evaluation

- The assessment of assignments will depend on (1) the quality of the submissions, e.g., presentation, cleanliness, etc., and (2) the correctness of the results.
- The final grade will be calculated using a weighted average as described before.
- The cooperative activities labeled "PROJECT:" are compulsory. Failing to attend these activities without due reason implies failing the project.
- The students cannot retake the course project in the global evaluation. The project requires the cooperation of groups of students and has a pre-specified calendar, including face-to-face sessions. These activities cannot be scheduled at different times because it is not guaranteed that fellow students have other time slots available apart from the ones assigned to the Requirements Engineering course.
- The students cannot retake the term paper. First, this activity does not have a minimum grade, i.e., there is no "fail" grade. Second, the term paper is evaluated using peer review; it implies that the paper should be available at the designated time. Finally, the term paper requires a substantial effort that students cannot likely perform between the submission time and the Global Examination date; these dates correspond to the course evaluation period.

Global evaluation (January)

- All assignments can be re-submitted and regraded. When the instructors provide the feedback, they will specify a deadline for the resubmission.
- The students can resit the midterm exams in January (on the date/time specified by the administration).
- The project and the term paper cannot be retaken.

Global evaluation (July)

- Students will take a single exam. This exam includes all topics (theoretical and practical) covered in the course. Preparatory materials will be available at Moodle.

7. Teaching resources

7.1. Teaching resources for the subject

Name	Type	Notes
Course material	Web resource	All required materials will be available at moodle