ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

103000933 - Requirements Engineering

DEGREE PROGRAMME

10AZ - Master Universitario En Innovación Digital

ACADEMIC YEAR & SEMESTER

2021/22 - 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 ot 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	2021-22

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Natalia Juristo Juzgado	D5104	natalia.juristo@upm.es	Sin horario. Please check office hours in the "Course information section" at Moodle.
Oscar Dieste Tubio (Subject coordinator)	D6203	oscar.dieste@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

CB10 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.

CE-EIT04 - Capacidad para desarrollar un proyecto y un modelo completos de negocio orientados al cliente usando una metodología iterativa siguiendo los pasos necesarios para crear una empresa de base tecnológica sostenible incluyendo consideraciones éticas, sociales y medioambientales.

CE-EIT05 - Capacidad para definir el plan de marketing y su expansión internacional para un producto o servicio tecnológico, negociando con otros actores en el área TIC su participación en la cadena de valor, creando una estructura comercial y una estrategia de precios.

CE-FT02 - Capacidad para analizar problemas de naturaleza financiera y su resolución mediante aplicación de tecnologías de la información y la comunicación

CG03 - La capacidad de usar la lengua inglesa de manera competente, es decir, con capacitación para tareas complejas de trabajo y estudio.

3.2. Learning outcomes

RA118 - Manage requirements

RA117 - Document and validate requirements specifications

RA116 - Elicit and analyze software requirements

* 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

7. System/acceptance testing

5. Schedule

5.1. Subject schedule*

Week	Face-to-face classroom activities	Face-to-face laboratory activities	Distant / On-line	Assessment activities
1	**Requirements engineering process (including agile approaches)** Duration: 00:30 **Course goals and methodology** Duration: 00:10 **Software project proposal** Duration: 00:10 **Term paper proposal** Duration: 00:10 **Requirement types** Duration: 02:00		**Requirements engineering process (including agile approaches)** Duration: 00:30 **Course goals and methodology** Duration: 00:10 **Software project proposal** Duration: 00:10 **Term paper proposal** Duration: 00:10 **Requirement types** Duration: 02:00	**Identifying software requirements for an existing software application** Continuous assessment Not Presential Duration: 02:00
2	**Software requirements specification** Duration: 01:00 **Software requirements attributes (and relationship with Management)** Duration: 00:30	**Tool support for requirements specification: Rational Requisite Pro** Duration: 01:30	**Software requirements specification** Duration: 01:00 **Software requirements attributes (and relationship with Management)** Duration: 00:30 **Tool support for requirements specification** Duration: 01:30	**Creation a requirement specification using Requisite Pro** Continuous assessment Not Presential Duration: 03:00
3	**Requirements validation** Duration: 00:30 **Requirements reviews** Duration: 00:30 **Perform a requirements review** Duration: 01:00 **Other validation approaches (user manual, requirements testing)** Duration: 01:00		**Requirements validation** Duration: 00:30 **Requirements reviews** Duration: 00:30 **Perform a requirements review** Duration: 01:00 **Other validation approaches (user manual, requirements testing)** Duration: 01:00	**Software project proposal** Continuous assessment Not Presential Duration: 03:00 **Report the validation exercises** Continuous assessment Not Presential Duration: 01:00

4	**Requirements elicitation** Duration: 00:30 **Elicitation with interviews** Duration: 00:30 **Project: Conduct the elicitation of a software project using interviews** Duration: 02:00		**Requirements elicitation** Duration: 00:30 **Elicitation with interviews** Duration: 00:30 **Project: Conduct the elicitation of a software project using interviews** Duration: 02:00	**Midterm exam** Continuous assessment Not Presential Duration: 00:30
5	**Analysis: Overview** Duration: 00:20 **Analysis: Weak techniques** Duration: 00:20 **Analysis: Low-fidelity prototypes** Duration: 00:20 **Project: Conduct a prototype evaluation** Duration: 01:00	**Tool support for requirements projects: IBM Doors Next Generation** Duration: 01:00	**Analysis: Overview** Duration: 00:20 **Analysis: Weak techniques** Duration: 00:20 **Analysis: Low-fidelity prototypes** Duration: 00:20 **Project: Conduct a prototype evaluation** Duration: 01:00 **Tool support for requirements projects: IBM Doors Next Generation** Duration: 01:00	**Add elicitation & prototyping information to DOORS** Continuous assessment Not Presential Duration: 03:00 **Perform checklist-based analysis using DOORS** Continuous assessment Not Presential Duration: 01:00
6	**Elicitation: Other techniques, e.g., brainstorming, quizzes, etc.** Duration: 01:00 **Project: Conduct the elicitation of a software project using brainstorming, etc.** Duration: 02:00		**Elicitation: Other techniques, e.g., brainstorming, quizzes, etc.** Duration: 01:00 **Project: Conduct the elicitation of a software project using brainstorming, etc.** Duration: 02:00	
7	**Elicitation: Requirements workshops and focus groups** Duration: 01:00 **Project: Conduct the elicitation of a software project using a requirements workshop** Duration: 02:00		**Elicitation: Requirements workshops and focus groups** Duration: 01:00 **Project: Conduct the elicitation of a software project using a requirements workshop** Duration: 02:00	**Perform checklist-based analysis using DOORS** Continuous assessment Not Presential Duration: 01:00 **Creation a requirement specification using DOORS** Continuous assessment Not Presential Duration: 04:00

8	**Analysis: Conceptual models** Duration: 01:00 **Project: Create models for the different product perspectives (and enter them in DOORS)** Duration: 02:00		**Analysis: Conceptual models** Duration: 01:00 **Project: Create models for the different product perspectives (and enter them in DOORS)** Duration: 02:00	**Midterm exam** Continuous assessment Not Presential Duration: 00:30 **Report the conceptual models and the cross-checks** Continuous assessment Not Presential Duration: 01:00
9	**Validation: High-fidelity prototype** Duration: 00:20 **Prepare high-fidelity prototype (each group creates the high fidelity prototype for their project proposal)** Duration: 02:00 **Perform a reverse-prototype evaluation** Duration: 00:40		**Validation: High-fidelity prototype** Duration: 00:20 **Prepare high-fidelity prototype (each group creates the high fidelity prototype for their project proposal)** Duration: 02:00 **Perform a reverse-prototype evaluation** Duration: 00:40	**Report the reverse check** Continuous assessment Not Presential Duration: 01:00 **Creation the final version of the requirement specification using DOORS** Continuous assessment Not Presential Duration: 03:00
10	**Early estimation** Duration: 01:00 **Requirements management** Duration: 00:30 **Project: Perform A change management process** Duration: 01:30		**Early estimation** Duration: 01:00 **Requirements management** Duration: 00:30 **Project: Perform A change management process** Duration: 01:30	**Term paper submission** Continuous assessment Not Presential Duration: 15:00 **Report the change management process** Continuous assessment Not Presential Duration: 01:00
11	**Requirements prioritization** Duration: 00:20 **Triage and release planning** Duration: 00:40 **Project: Negotiation (/triage) and release planning** Duration: 01:00		**Requirements prioritization** Duration: 00:20 **Triage and release planning** Duration: 00:40 **Project: Negotiation (/triage) and release planning** Duration: 01:00	**Term paper presentation** Continuous assessment Not Presential Duration: 01:00 **Report the triage process** Continuous assessment Not Presential Duration: 01:00
12	**Human aspects in Requirements Engineering** Duration: 02:00		**Human aspects in Requirements Engineering** Duration: 02:00	**End term exam** Continuous assessment Not Presential Duration: 01:00
13	**Keynote: Practical experiences managing requirements** Duration: 01:00 **Project: Retrospective** Duration: 01:00		**Keynote: Practical experiences managing requirements** Duration: 01:00 **Project: Retrospective** Duration: 01:00	**Term paper presentation** Continuous assessment Not Presential Duration: 01:00

14		**Seminar: Model-driven engineering (parte 1)** Duration: 02:00	**Seminar: Model-driven engineering (parte 1)** Duration: 02:00	**Term paper presentation** Continuous assessment Not Presential Duration: 01:00
15		**Seminar: Model-driven engineering (parte 2)** Duration: 02:00	**Seminar: Model-driven engineering (parte 2)** Duration: 02:00	**Term paper presentation** Continuous assessment Not Presential Duration: 01:00
16	**Keynote: Artifact-driven Requirements Engineering** Duration: 02:00		**Keynote: Artifact-driven Requirements Engineering** Duration: 02:00	**Development of a simple application using MDA** Continuous assessment Not Presential Duration: 05:00 **Term paper presentation** Continuous assessment Not Presential Duration: 01:00
17				**End term exam** Final examination Presential Duration: 05:00

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. Continuous assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
1	Identifying software requirements for an existing software application		No Presential	02:00	4%	3 / 10	CE-EIT04 CG03
2	Creation a requirement specification using Requisite Pro		No Presential	03:00	5%	3 / 10	CE-EIT04 CG03
3	Software project proposal		No Presential	03:00	3%	3 / 10	CB07 CE-EIT04 CG03 CB09
3	Report the validation exercises		No Presential	01:00	3%	3 / 10	CE-EIT04 CG03
4	Midterm exam		No Presential	00:30	10%	5 / 10	CE-EIT04 CG03
5	Add elicitation & prototyping information to DOORS		No Presential	03:00	3%	3 / 10	CB07 CE-EIT04 CG03
5	Perform checklist-based analysis using DOORS		No Presential	01:00	2%	3 / 10	CB07 CE-EIT04 CG03
7	Perform checklist-based analysis using DOORS		No Presential	01:00	2%	3 / 10	CB07 CE-EIT04 CG03
7	Creation a requirement specification using DOORS		No Presential	04:00	6%	3 / 10	CB07 CE-EIT04 CG03
8	Midterm exam		No Presential	00:30	10%	5 / 10	CE-EIT04 CG03
8	Report the conceptual models and the cross-checks		No Presential	01:00	3%	3 / 10	CB07 CE-EIT04 CG03
9	Report the reverse check		No Presential	01:00	3%	3 / 10	CB07 CE-EIT04 CG03 CB09

9	Creation the final version of the requirement specification using DOORS		No Presential	03:00	6%	3 / 10	CB07 CE-EIT04 CG03
10	Term paper submission		No Presential	15:00	10%	5 / 10	CB10 CG03
10	Report the change management process		No Presential	01:00	5%	3 / 10	CE-EIT04 CG03 CB09 CE-FT02
11	Term paper presentation		No Presential	01:00	1%	3 / 10	CG03 CB09
11	Report the triage process		No Presential	01:00	5%	3 / 10	CB09 CE-FT02 CE-EIT05 CG03
12	End term exam		No Presential	01:00	10%	5 / 10	CE-EIT04 CG03
13	Term paper presentation		No Presential	01:00	1%	3 / 10	CG03 CB09
14	Term paper presentation		No Presential	01:00	1%	3 / 10	CG03 CB09
15	Term paper presentation		No Presential	01:00	1%	3 / 10	CG03 CB09
16	Development of a simple application using MDA		No Presential	05:00	5%	3 / 10	CG03 CE-EIT04
16	Term paper presentation		No Presential	01:00	1%	3 / 10	CG03 CB09

6.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
17	End term exam		Face-to-face	05:00	100%	6.5 / 10	CB07 CB10 CE-EIT04 CE-EIT05 CG03 CB09 CE-FT02

6.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
Final exam (extraordinary session)		Face-to-face	05:00	100%	6.5 / 10	CB07 CB10 CE-EIT04 CE-EIT05 CG03 CB09 CE-FT02

6.2. Assessment criteria

Continuous 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.

Final exam (January)

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

Final exam (extraordinary session)

- See **Final Exam (January)**

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