



POLITÉCNICA

INTERNATIONAL  
CAMPUS OF  
EXCELLENCE

COORDINATION PROCESS OF  
LEARNING ACTIVITIES  
PR/CL/001



E.T.S. de Ingenieros  
Informaticos

# ANX-PR/CL/001-01

## LEARNING GUIDE

### SUBJECT

**103000872 - Evaluation Of Interactive Systems**

### DEGREE PROGRAMME

10AZ - Master Universitario En Innovación Digital

### ACADEMIC YEAR & SEMESTER

2024/25 - Semester 2

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## 1. Description

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### 1.1. Subject details

<b>Name of the subject</b>	103000872 - Evaluation Of Interactive Systems
<b>No of credits</b>	3 ECTS
<b>Type</b>	Optional
<b>Academic year of the programme</b>	First year
<b>Semester of tuition</b>	Semester 2
<b>Tuition period</b>	February-June
<b>Tuition languages</b>	English
<b>Degree programme</b>	10AZ - Master Universitario en Innovación Digital
<b>Centre</b>	10 - Escuela Tecnica Superior De Ingenieros Informaticos
<b>Academic year</b>	2024-25

## 2. Faculty

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### 2.1. Faculty members with subject teaching role

<b>Name and surname</b>	<b>Office/Room</b>	<b>Email</b>	<b>Tutoring hours *</b>
Oscar Dieste Tubio	6203	oscar.dieste@upm.es	Tu - 18:00 - 20:00 Th - 16:00 - 20:00 Please, ask for an appointment by email.
Cristian Moral Martos	5110	cristian.moral@upm.es	M - 10:00 - 14:00 Tu - 12:00 - 14:00 Please, ask for an appointment by email.

Elena Villalba Mora (Subject coordinator)	5110	elena.villalba@upm.es	M - 10:00 - 12:00 W - 10:00 - 12:00 F - 10:00 - 12:00 Please, ask for an appointment by email.
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\* The tutoring schedule is indicative and subject to possible changes. Please check tutoring times with the faculty member in charge.

### 3. Prior knowledge recommended to take the subject

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#### 3.1. Recommended (passed) subjects

- Hci: Introduction And Design Methods

#### 3.2. Other recommended learning outcomes

- User Centred Design, Usability

### 4. Skills and learning outcomes \*

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#### 4.1. 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

CE-DIPO02 - Capacidad para evaluar la interacción persona-ordenador de productos y servicios de alto valor innovador

## 4.2. Learning outcomes

RA42 - Understand and carry experiments to evaluate interactive systems

RA41 - Plan and perform evaluation of prototypes with different fidelity levels

RA40 - Evaluate the usability of prototypes

\* 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.

## 5. Brief description of the subject and syllabus

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### 5.1. Brief description of the subject

This course teaches methods to perform usability evaluation, experimental design and to statistically analyse the results. Different evaluation methods will be introduced for different tasks, user groups, and performed in a lab environment as well as in field.

Additionally, this course place the user in the centre of the evaluation, including vulnerable groups as participants with disabilities.

### 5.2. Syllabus

1. Introduction to evaluation of interactive systems
2. Inspection methods
  - 2.1. Introduction to inspection methods
  - 2.2. Heuristic evaluation
3. Interrogation techniques
4. Usability testing
  - 4.1. Introduction to usability testing
  - 4.2. Planning and conducting usability testing
  - 4.3. Analysing and reporting usability testing

## 5. Empirical research and experiments

5.1. Introduction to empirical research

5.2. Hypotheses and p-values

5.3. AB experiments

5.4. Simple within-subjects designs

5.5. Statistical power

5.6. Theoretical and practical considerations

5.7. Linear modelling

5.8. Experimental designs

## 6. Schedule

### 6.1. Subject schedule\*

Week	Type 1 activities	Type 2 activities	Distant / On-line	Assessment activities
1	<b>1. Introduction</b> Duration: 02:00 Lecture			
2	<b>2.1 Inspection methods. 2.2 Heuristics evaluation</b> Duration: 02:00 Lecture			
3	<b>2.2 Understanding Heuristics</b> Duration: 02:00 Additional activities			
4	<b>3. Interrogation techniques</b> Duration: 00:30 Lecture  <b>4.1 Introduction to usability testing. 4.2. Planning and conducting usability testing</b> Duration: 01:30 Lecture			<b>Planning a usability test</b> Group work Progressive assessment Not Presential Duration: 02:00
5	<b>2.2. Presentation of Heuristics evaluation</b> Duration: 02:00 Cooperative activities			<b>Presentation of inspection evaluation</b> Group presentation Progressive assessment Presential Duration: 02:00
6	<b>4.3 Analysing and reporting usability testing</b> Duration: 02:00 Laboratory assignments			
7	<b>4.2. Presentation of usability testing</b> Duration: 02:00 Design thinking			<b>Conducting, analysing and reporting a usability test</b> Group presentation Progressive assessment Presential Duration: 08:00
8	<b>5.1 Introduction to empirical research</b> Duration: 02:00 Lecture			
9	<b>5.2 Hypotheses and p-values</b> Duration: 02:00 Laboratory assignments			
10	<b>5.3 AB experiments</b> Duration: 02:00 Lecture			

11	<b>5.4 Simple within-subject design</b> Duration: 02:00 Laboratory assignments			<b>Propose an experiment</b> Group work Progressive assessment Not Presential Duration: 02:00
12	<b>5.5 Statistical power</b> Duration: 02:00 Laboratory assignments			<b>Calculate sample size</b> Group work Progressive assessment Not Presential Duration: 02:00
13	<b>5.6 Theoretical and practical considerations</b> Duration: 02:00 Laboratory assignments			<b>Conduct an experiment</b> Group work Progressive assessment Not Presential Duration: 04:00
14	<b>5.7 Linear modelling</b> Duration: 02:00 Laboratory assignments			<b>Analyze an experiment</b> Group work Progressive assessment Not Presential Duration: 02:00
15				<b>Report and experiment</b> Group work Progressive assessment Not Presential Duration: 04:00
16				
17				<b>Final written exam</b> Written test Global examination Presential Duration: 03:00

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.



## 7. Activities and assessment criteria

### 7.1. Assessment activities

#### 7.1.1. Assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
4	Planning a usability test	Group work	No Presential	02:00	10%	/ 10	CE-DIPO02 CB07
5	Presentation of inspection evaluation	Group presentation	Face-to-face	02:00	25%	/ 10	CE-DIPO02 CB07
7	Conducting, analysing and reporting a usability test	Group presentation	Face-to-face	08:00	25%	/ 10	CE-DIPO02 CB07
11	Propose an experiment	Group work	No Presential	02:00	5%	/ 10	CE-DIPO02
12	Calculate sample size	Group work	No Presential	02:00	5%	/ 10	CE-DIPO02
13	Conduct an experiment	Group work	No Presential	04:00	10%	/ 10	CE-DIPO02
14	Analyze an experiment	Group work	No Presential	02:00	10%	/ 10	CE-DIPO02
15	Report and experiment	Group work	No Presential	04:00	10%	/ 10	CE-DIPO02

#### 7.1.2. Global examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
17	Final written exam	Written test	Face-to-face	03:00	100%	5 / 10	CE-DIPO02 CB07

#### 7.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
Final written exam	Written test	Face-to-face	03:00	100%	5 / 10	CE-DIPO02 CB07

## 7.2. Assessment criteria

### Grading criteria

The projects will be evaluated during their iterative development during the course. Grading of students will be based on:

- 1) Quality of the oral communication skills.
- 2) Ability to debate
- 3) Ability to understand concepts.

### Progressive evaluation system

The evaluation is progressive along the semester, concrete dates for the presentations and submissions of the assignments are fixed with sufficient notice to the students.

100% of the grade is based on group-work during the semester which includes some presentations in the classroom, therefore it cannot be re-submitted in case a student fails the assignments (i.e. Usability test and Heuristics assignments), but there are not minimal grades per assignment.

The evaluation activities and their concrete weight in the grading are described in "Continuous evaluation" ("Evaluación progresiva") above.

### Global evaluation process

For those students that are not able to obtain in total a 5 over 10 in the progressive evaluation, either must finish a concrete milestone they haven't passed (upon agreement with the professor), or a final exam that replace 100% of the grade.

This is described in "Global evaluation" ("Evaluación global") above.

### Extraordinary evaluation

The extraordinary evaluation exists for students unable to pass the course during the semester. For that

extraordinary evaluation students either must finish a concrete milestone they haven't passed (upon agreement with the professor), or a final exam that replace 100% of the grade.

## 8. Teaching resources

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### 8.1. Teaching resources for the subject

Name	Type	Notes
Moodle	Web resource	<a href="https://moodle.upm.es/titulaciones/oficiales">https://moodle.upm.es/titulaciones/oficiales</a>
Interaction Design: Beyond Human-Computer Interaction.	Bibliography	Helen Sharp, Yvonne Rogers, Jenny Preece. 3ª Edición. John Wiley & Sons, 2011.
Usability Engineering	Bibliography	Jakob Nielsen. AP Professional, 1993.
Applied Statistics and Probability for Engineers	Bibliography	Douglas C. Montgomery, George C. Runger. Applied Statistics and Probability for Engineers. John Wiley & Sons, 2010. <a href="https://learning.oreilly.com/library/view/applied-statistics-and/9780470053041/">https://learning.oreilly.com/library/view/applied-statistics-and/9780470053041/</a>

## 9. Other information

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### 9.1. Other information about the subject

The objective of this course is to learn methods and technique to design interactive systems that have an adequate degree of usability and accessibility for a concrete vulnerable group: older population. Taking this into account, and the UN recommendations on SDGs, this subject deals with competencies related to the following SDGs:

- Goal 4. Quality education - Ensure inclusive, equitable and quality education and promote lifelong learning opportunities for all. To facilitate this objective, interactive systems designed for teaching, which are increasingly important in society, must meet usability and accessibility requirements discussed in the subject.
- Goal 8. Decent work and economic growth - Promote inclusive and sustainable economic growth, employment and decent work for all. Today many jobs depend on the use of interactive systems. These systems must meet usability and accessibility requirements to promote equal opportunities at work, not discriminating because of age. New solutions and challenges related to ageing will also create new opportunities.
- Goal 10. Reduced inequalities - To favor the inclusion of all people in society, interactive systems that are designed for all types of activities, including citizen participation, culture and leisure, must meet the usability and accessibility requirements covered in the subject. This is of crucial importance for the older population whose requirements are usually not considered when designing interactive systems. This way we can reduce ageism.

The following innovative teaching methodology is implemented in the course to motivate and reinforce student learning (<https://innovacioneducativa.upm.es/guias-pdi>):

- Design Thinking: the project follows a User Centred Design, Inclusive Design and Design thinking approach.

Besides, the whole course applies "learn by doing", so students are challenged to practice techniques learnt during the classes. In addition, in some classes, we apply role playing to practice how to conduct usability testing before going into the field to practice.

Note 1: please, always ask for an appointment before visiting a professor.

Note 2: please note that concrete dates for the assignments will be informed at the beginning of the course.