ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

93000980 - Ambient Intelligence

DEGREE PROGRAMME

09AU - Master Universitario En Ingenieria Biomedica

ACADEMIC YEAR & SEMESTER

2023/24 - Semester 2

Index

Learning guide

1. Description

1.1. Subject details

Name of the subject	93000980 - Ambient Intelligence
No of credits	3 ECTS
Type	Optional
Academic year ot the programme	First year
Semester of tuition	Semester 2
Tuition period	February-June
Tuition languages	English
Degree programme	09AU - Master Universitario en Ingenieria Biomedica
Centre	09 - Escuela Tecnica Superior De Ingenieros De Telecomunicacion
Academic year	2023-24

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Maria Fernanda Cabrera Umpierrez (Subject coordinator)		mf.cabrera@upm.es	- -
Giuseppe Fico		giuseppe.fico@upm.es	Sin horario.
Cecilia Vera Muñoz	D-204	cecilia.vera@upm.es	Sin horario.

* 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

CB06 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación

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

CB08 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios

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.

CG-MIB01 - Resolver problemas e integrar conocimiento en temas nuevos o escasamente definidos y en entornos multidisciplinares del área de la Ingeniería Biomédica

CG-MIB02 - Analizar y aplicar la reglamentación correspondiente a la sensibilidad social y ética en los ámbitos de operación que pueden darse en Ingeniería Biomédica

CG-MIB03 - Utilizar la filosofía, el método científico y el método experimental para la búsqueda de innovación, la curiosidad científica y el desarrollo de actitudes creativas

CG-MIB04 - Utilizar las tecnologías de la información y la comunicación para la búsqueda de información, datos bibliográficos y adquisición de nuevo conocimiento para la formación permanente y el trabajo autónomo

CG-MIB05 - Utilizar técnicas de expresión oral y escrita para comunicar trabajos y conclusiones a comunidades de iguales o divulgación científica, elaboración de artículos, manuales de estilo y herramientas de edición para fomentar la capacidad de comunicación y diseminación de resultados

CG-MIB06 - Aplicar técnicas de trabajo colaborativo en equipos multidisciplinares internacionales y liderazgo, así como utilizar métodos para asumir la responsabilidad de orientar y dirigir trabajos científicos en el ámbito de la

ingeniería Biomédica

3.2. Learning outcomes

RA31 - Aplicación de conocimientos teóricos y habilidades prácticas en las metodologías más avanzadas y las tecnologías de la información y las comunicaciones para el modelado, desarrollo, integración y evaluación de servicios de inteligencia ambiental y tecnologías asistivas.

* 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 objective of this subject is to develop a comprehensive understanding of Ambient Intelligence, including its conceptual framework, historical evolution, and practical applications. Through this course, students will gain competencies in utilizing cutting-edge technologies and designing innovative services in the domains of health and independent living. By exploring the interdisciplinary nature of Ambient Intelligence, students will acquire the skills to address complex challenges and leverage technological advancements to enhance the quality of life for individuals in various environments.

4.2. Syllabus

1. Introduction
2. AMI architectures and technologies
   2.1. AMI sysem architectures
   2.2. Information models in AMI
3. Technologies for Independent Living
   3.1. Independent living paradigm
   3.2. Active and Assisted Living Services
   3.3. Practical examples (LifeSpace)
4. Accessibility
5. AMI and health
6. Ethical implications
7. Practical cases

5. Schedule

5.1. Subject schedule*

Week	Classroom activities	Laboratory activities	Distant / On-line	Assessment activities
1	**Theme 1** Duration: 02:30 Lecture			**Practical case** Group work Continuous assessment Presential Duration: 00:00
2	**Theme 2** Duration: 02:30 Lecture			**Practical case** Group work Continuous assessment Presential Duration: 00:00
3	**Theme 2** Duration: 02:30 Lecture			**Practical case** Group work Continuous assessment Presential Duration: 00:00
4	**Theme 3** Duration: 02:30 Lecture			**Practical case** Group work Continuous assessment Presential Duration: 00:00
5	**Theme 3** Duration: 02:30 Lecture			**Practical case** Group work Continuous assessment Presential Duration: 00:00
6	**Theme 3** Duration: 02:30 Laboratory assignments			**Practical case** Group work Continuous assessment Presential Duration: 00:00
7	**Theme 4** Duration: 02:30 Lecture			**Practical case** Group work Continuous assessment Presential Duration: 00:00
8	**Theme 4** Duration: 02:30 Lecture			**Practical case** Group work Continuous assessment Presential Duration: 00:00
9	**Theme 5** Duration: 02:30 Lecture			**Practical case** Group work Continuous assessment Presential Duration: 00:00

10	**Theme 5** Duration: 02:30 Lecture			**Practical case** Group work Continuous assessment Presential Duration: 00:00
11	**Theme 5** Duration: 02:30 Lecture			**Practical case** Group work Continuous assessment Presential Duration: 00:00
12	**Theme 6** Duration: 02:30 Lecture			**Practical case** Group work Continuous assessment Presential Duration: 00:00
13	**Theme 6** Duration: 02:30 Lecture			**Practical case** Group work Continuous assessment Presential Duration: 00:00
14	**Theme 7** Duration: 02:30 Additional activities			**Presentation of the practical case** Group presentation Continuous assessment Presential Duration: 02:30 **Development and presentation of the practical case. Compulsory activity** Group presentation Final examination Presential Duration: 01:30
15				
16				
17				**Exam** Written test Continuous assessment Presential Duration: 02:30 **Exam** Written test Final examination Presential Duration: 02:30

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	Practical case	Group work	Face-to-face	00:00	2.83%	5 / 10	CB06 CB10 CG-MIB04
2	Practical case	Group work	Face-to-face	00:00	2.83%	5 / 10	CB06 CB10 CG-MIB04
3	Practical case	Group work	Face-to-face	00:00	2.84%	5 / 10	CB06 CB10 CG-MIB04
4	Practical case	Group work	Face-to-face	00:00	2.84%	5 / 10	CB06 CB10 CG-MIB04
5	Practical case	Group work	Face-to-face	00:00	2.84%	5 / 10	CB06 CB10 CG-MIB04
6	Practical case	Group work	Face-to-face	00:00	2.84%	5 / 10	CB06 CB10 CG-MIB04
7	Practical case	Group work	Face-to-face	00:00	2.84%	5 / 10	CB06 CB10 CG-MIB04
8	Practical case	Group work	Face-to-face	00:00	3.84%	5 / 10	CB06 CB10 CG-MIB04
9	Practical case	Group work	Face-to-face	00:00	2.84%	5 / 10	CB06 CB10 CG-MIB04
10	Practical case	Group work	Face-to-face	00:00	2.84%	5 / 10	CB06 CB10 CG-MIB04
11	Practical case	Group work	Face-to-face	00:00	2.84%	5 / 10	CB06 CB10 CG-MIB04

12	Practical case	Group work	Face-to-face	00:00	3.84%	5 / 10	CB06 CB10 CG-MIB04
13	Practical case	Group work	Face-to-face	00:00	3.84%	5 / 10	CB06 CB10 CG-MIB04
14	Presentation of the practical case	Group presentation	Face-to-face	02:30	10.1%	5 / 10	CB09 CB08 CG-MIB06
17	Exam	Written test	Face-to-face	02:30	50%	5 / 10	CB06 CB07 CB10 CG-MIB03 CG-MIB04 CG-MIB05 CG-MIB01 CG-MIB02

6.1.2. Global examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
14	Development and presentation of the practical case. Compulsory activity	Group presentation	Face-to-face	01:30	50%	5 / 10	CB09 CB08 CG-MIB06
17	Exam	Written test	Face-to-face	02:30	50%	5 / 10	CB06 CB07 CB10 CG-MIB03 CG-MIB04 CG-MIB05 CG-MIB01 CG-MIB02

6.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
Written exam	Written test	Face-to-face	02:03	50%	5 / 10	CB06 CB07 CB10 CG-MIB03 CG-MIB04 CG-MIB05 CG-MIB01

						CG-MIB02
Practical case presentation. Compulsory activity	Other assessment	Face-to-face	02:30	50%	5 / 10	CB09 CB08 CG-MIB06

6.2. Assessment criteria

The course will be approved when a grade greater than or equal to 5 points out of a total of 10 is obtained.

Progressive evaluation

By default, students will be evaluated through progressive evaluation. The final grade in progressive evaluation will be determined by summing the qualifications corresponding to the different evaluation activities, with the following weights:

- Written exam: 50%

- Completion and presentation of mandatory group work: 50%

The evaluation will assess whether students have acquired the competences of the subject. To pass the course, students must obtain a minimum score of 5 out of 10 in the completion of the group work and its presentation, as well as in the written exam. The individual contribution to group work will be supervised and considered a requirement to pass the course.

Global evaluation

Students who wish to waive the progressive evaluation must send an email through the subject's Moodle platform to the subject coordinator, at least two weeks before the extraordinary exam period approved by the School Board for the current course and semester. In this case, it is necessary to complete the group work and its presentation to acquire all the subject skills, in addition to taking the final exam. The global evaluation will be carried out considering the evaluation techniques used in the progressive evaluation.

Extraordinary evaluation

The extraordinary evaluation will follow the same evaluation techniques as the global evaluation.

7. Teaching resources

7.1. Teaching resources for the subject

Name	Type	Notes
Sitio Moodle de la asignatura	Web resource	
Affective Computing. Rosalind W. Picard. MIT Press, 2000	Bibliography	
Handbook of Ambient Assisted Living: Technology for Healthcare, Rehabilitation and Well-being. Juan Carlos Augusto, M. Huch, Achilles Kameas, Julie Maitland, Paul McCullagh IOS Press, 2012	Bibliography	
B. Fogg Persuasive Technology: Using Computers to Change What We Think and Do (Interactive Technologies) 1st Edición. 2003	Bibliography	

8. Other information

8.1. Other information about the subject

The subject is directly related to SDG 3, promoting healthy life and wellbeing of the citizens. Moreover, it promotes sustained, inclusive and sustainable economic growth through different approaches explained to the students, contributing to SDG 8. Being the subject of a technical nature, the practical projects will include sections to contribute to the SDGs in particular to number 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. The course will also help sub-objectives 4.3: Ensure that students access quality technical, professional and superior training; 4.4: Significantly increase the number of people with the professional and technical skills necessary to access employment and entrepreneurship; and 4.7: Ensure that all students acquire the theoretical and practical knowledge necessary to promote sustainable development.