



POLITÉCNICA

INTERNATIONAL
CAMPUS OF
EXCELLENCE

COORDINATION PROCESS OF
LEARNING ACTIVITIES
PR/CL/001



E.T.S. de Ingenieros de
Telecomunicacion

ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

93000980 - Ambient Intelligence

DEGREE PROGRAMME

09AU - Master Universitario En Ingenieria Biomedica

ACADEMIC YEAR & SEMESTER

2022/23 - Semester 2

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1. Description

1.1. Subject details

Name of the subject	93000980 - Ambient Intelligence
No of credits	3 ECTS
Type	Optional
Academic year of 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	2022-23

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.

* 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

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-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 disseminación de resultados

3.2. Learning outcomes

RA119 - Apply the concept of Ambient Intelligence to the domain of health and social inclusion

RA117 - Design services based on the Ambient Intelligence paradigm

RA118 - Perform individual and team work by searching sources of information, critical discussion and present the results in oral and public presentation

* 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 acquire competencies in the field of Ambient Intelligence, through the knowledge of its concept and evolution over time, the technologies and the services that can be offered especially in the areas of health and independent living.

4.2. Syllabus

1. Introduction
2. AMI architectures and technologies
 - 2.1. Arquitectura del los sistemas AMI
 - 2.2. Modelos de información en sistemas AMI: ontologías y sensores
3. Technologies for Independent Living
 - 3.1. Independent living paradigm
 - 3.2. Active and Assisted Living Services
 - 3.3. Practical examples (Living Lab)
4. Accessibility
 - 4.1. Accessible Open Services
 - 4.2. Services for social inclusion
5. AMI and health
 - 5.1. AMI in chronic disease management
 - 5.2. IoT in healthcare
 - 5.3. AMI in neurodegenerative diseases
6. AMI: Technological annexes
 - 6.1. Immersive interaction
 - 6.2. Affective computing
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
15				
16				
17				Exam Written test Continuous assessment Presential Duration: 02:30 Exam Written test Final examination Presential Duration: 02:30 Presentation of the practical case Group presentation Final examination Presential Duration: 01:30

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

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

6.1.2. Global examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
17	Exam	Written test	Face-to-face	02:30	50%	5 / 10	CG-MIB04 CG-MIB05 CB06 CB10
17	Presentation of the practical case	Group presentation	Face-to-face	01:30	50%	5 / 10	CB06 CB10 CG-MIB04 CG-MIB05

6.1.3. Referred (re-sit) examination

No se ha definido la evaluación extraordinaria.

6.2. Assessment criteria

Students will be qualified through progressive evaluation by default. Students willing to renounce to progressive evaluation must direct a request to the coordinator of the subject.

The course will be approved when a grade greater than or equal to 5 points is obtained out of a total of 10. The final grade in progressive evaluation will be obtained by adding the grades corresponding to the different evaluation activities, with the following weights:

- Examination: 50%
- Final project development and presentation: 50%

Evaluation will assess if students have acquired all the competences of the subject. Thus, evaluation through final

assessment will be carried out considering all the evaluation techniques used in progressive evaluation (EX, ET, TG, etc.), and will be celebrated in the exam period approved by Junta de Escuela for the current academic semester and year. Evaluation activities that assess learning outcomes that cannot be evaluated through a single exam can be carried out along the semester.

Extraordinary examination and students that have withdrawn the progressive evaluation will be assessed through a final exam and a final project development and presentation that will assess all competences of the subject.

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.