COORDINATION PROCESS OF
LEARNING ACTIVITIES
PR/CL/001

INTERNATIONAL
CAMPUS OF
EXCELLENCE

POLITÉCNICA

INDUSTRIALES
ETSII | UPM

E.T.S. de Ingenieros
Industriales

ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

53001544 - Initation To Research

DEGREE PROGRAMME

05BG - Master Universitario En Electronica Industrial

ACADEMIC YEAR & SEMESTER

2021/22 - Semester 1

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Learning guide

1. Description

1.1. Subject details

Name of the subject	53001544 - Initation To Research
No of credits	6 ECTS
Type	Optional
Academic year ot the programme	First year
Semester of tuition	Semester 1 Semester 2
Tuition period	September-January
Tuition languages	English
Degree programme	05BG - Master Universitario en Electronica Industrial
Centre	05 - Escuela Tecnica Superior De Ingenieros Industriales
Academic year	2021-22

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Alfonso Rodriguez Medina	Electrónica	alfonso.rodriguezm@upm.es	Sin horario.
Miroslav Vasic	Electrónica	miroslav.vasic@upm.es	Sin horario.
Yago Torroja Fungairiño	Electrónica	yago.torroja@upm.es	Sin horario.
Javier Uceda Antolin	Electrónica	javier.uceda@upm.es	Sin horario.
Eduardo De La Torre Arnanz (Subject coordinator)	Electrónica	eduardo.delatorre@upm.es	Sin horario.

Oscar Garcia Suarez	Electrónica	o.garcia@upm.es	Sin horario.
Jorge Portilla Berrueco	Electrónica	jorge.portilla@upm.es	Sin horario.
Jose Andres Otero Marnotes	Electrónica	joseandres.otero@upm.es	Sin horario.
Jose Antonio Cobos Marquez	Electrónica	ja.cobos@upm.es	Sin horario.
Pedro Alou Cervera	Electrónica	pedro.alou@upm.es	Sin horario.
Felix Antonio Moreno Gonzalez	Electrónica	felix.moreno@upm.es	Sin horario.
Airan Frances Roger	Electrónica	airan.frances@upm.es	Sin horario.
Maria Regina Ramos Hortal	Electrónica	regina.ramos@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. Prior knowledge recommended to take the subject

3.1. Recommended (passed) subjects

The subject - recommended (passed), are not defined.

3.2. Other recommended learning outcomes

- Electronic system design

- the previous required knowledge depends on the topic of the research

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4. Skills and learning outcomes *

4.1. 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

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

CG02 - Saber aplicar e integrar sus conocimientos, la comprensión de estos, su fundamentación científica y sus capacidades de resolución de problemas en entornos nuevos y definidos de forma imprecisa, incluyendo contextos de carácter multidisciplinar tanto investigadores como profesionales altamente especializados.

CG06 - Haber desarrollado la autonomía suficiente para participar en proyectos de investigación y colaboraciones científicas o tecnológicas dentro de su ámbito temático, en contextos interdisciplinares y, en su caso, con una alta componente de transferencia del conocimiento.

CG07 - Ser capaces de asumir la responsabilidad de su propio desarrollo profesional y de su especialización en uno o más campos de estudio.

CT04 - Organización y planificación

CT05 - Gestión de la información

CT07 - Trabajo en contextos internacionales

4.2. Learning outcomes

RA103 - Revisar el estado del arte en el tema elegido destacando las ideas principales

RA104 - Clasificar y organizar la información científica de interés para desarrollar un trabajo científico

RA105 - Elaborar un resumen científico del estado del arte

RA106 - Identificar las aportaciones originales del trabajo científico respecto al estado del arte

RA102 - Identificar oportunidades para el desarrollo de un trabajo científico original

* 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

5.1. Brief description of the subject

This is a non-conventional subject in the sense that students don't attend to regular classes and the topic followed by each student is different depending on his/her interests.

After some first introductory lessons that present how to perform scientific research, the students are associated with a supervisor that will personally follow the work achieved by the student. If the Master thesis project subject is decided soon, it is a graet advantage that the supervisor of the subject becomes the Master Thesis supervisor, too, but this is not strictly required.

The main aim of this subject is to initiate the master students in research activities. Each professor involved in the master program will propose research topics at the beginning of the semester and the students will apply for the topic they prefer. Once the topic is assigned to a particular student, the professor will tutor the activity during the whole semester. The type of works that are expected to be proposed by the professors are the following:

? Analysis of the state of the art of a given technology, technique, application?

? Analysis of a given solution, previously published in a paper or a patent, for a given problem,

? Proposal of a new solution for a given problem

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The outcome and the evaluation of this subject will be based on two elements:

1. A report, written in a ?paper? format, or a penta-chart which describes in detail the analysis and results obtained.

2. A public presentation in front of an evaluation panel composed of two or three professors of the master program. The tutor will not be part of this panel.

5.2. Syllabus

1. Introduction

    1.1. Organization of the subject

    1.2. Basics of scientific research

    1.3. Presentation of the topics (by the professors)

2. Development of the course work

3. Document elaboration

4. Presentation

6. Schedule

6.1. Subject schedule*

Week	Face-to-face classroom activities	Face-to-face laboratory activities	Distant / On-line	Assessment activities
1	**1. Introduction** Duration: 03:00 **Basics of scientific research** Duration: 04:00			
2			**Assigment of topics to the students** Duration: 01:00 **2. Development of the work** Duration: 01:00	
3			**2. Development of the work** Duration: 02:00	
4			**2. Development of the work** Duration: 02:00	
5			**2. Development of the work** Duration: 02:00	
6			**2. Development of the work** Duration: 02:00	
7			**2. Development of the work** Duration: 02:00	
8			**2. Development of the work** Duration: 02:00	
9			**2. Development of the work** Duration: 02:00	
10			**2. Development of the work** Duration: 02:00	
11			**2. Development of the work** Duration: 02:00	

12			**2. Development of the work** Duration: 02:00	
13				
14				
15				**Final paper / pentachart** Continuous assessment and final examination Presential Duration: 00:10
16	**Attending the presentations of the students** Duration: 04:00			**Final presentation** Continuous assessment and final examination Presential Duration: 00:15
17				

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.

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7. Activities and assessment criteria

7.1. Assessment activities

7.1.1. Continuous assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
15	Final paper / pentachart		Face-to-face	00:10	30%	5 / 10	CG02 CB08 CB09 CT05 CT07 CG06 CG07 CB06 CT04
16	Final presentation		Face-to-face	00:15	50%	5 / 10	CG02 CB08 CB09 CT05 CT07 CG06 CG07 CB06 CT04

7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
15	Final paper / pentachart		Face-to-face	00:10	30%	5 / 10	CG02 CB08 CB09 CT05 CT07 CG06 CG07 CB06 CT04
16	Final presentation		Face-to-face	00:15	50%	5 / 10	CG02 CB08 CB09 CT05 CT07 CG06 CG07 CB06

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								CT04

7.1.3. Referred (re-sit) examination

No se ha definido la evaluación extraordinaria.

7.2. Assessment criteria

Due to the particularities of this subject, the evaluation will be based on a continuous follow-up of the student's work by the professor. Particular milestones are fixed to assure the correct progress of the student work.

The assessment of the progress is done by an evaluation panel of three professors that will listen to a short talk (20 minutes) with the results of the work achieved, as well as inspecting the written document.

8. Teaching resources

8.1. Teaching resources for the subject

Name	Type	Notes
Papers, patents	Bibliography	external databases of papers, patents and projects