



POLITÉCNICA

INTERNATIONAL  
CAMPUS OF  
EXCELLENCE

COORDINATION PROCESS OF  
LEARNING ACTIVITIES  
PR/CL/001



E.T.S. de Ingenieros  
Industriales

# ANX-PR/CL/001-01

## LEARNING GUIDE

### SUBJECT

**53001556 - Analog And Power Electronics**

### DEGREE PROGRAMME

05BG - Master Universitario en Electronica Industrial

### ACADEMIC YEAR & SEMESTER

2020/21 - Semester 1

## Index

---

### Learning guide

1. Description.....	1
2. Faculty.....	1
3. Prior knowledge recommended to take the subject.....	2
4. Skills and learning outcomes .....	2
5. Brief description of the subject and syllabus.....	3
6. Schedule.....	5
7. Activities and assessment criteria.....	7
8. Teaching resources.....	8

## 1. Description

---

### 1.1. Subject details

<b>Name of the subject</b>	53001556 - Analog And Power Electronics
<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 1
<b>Tuition period</b>	September-January
<b>Tuition languages</b>	English
<b>Degree programme</b>	05BG - Master Universitario en Electronica Industrial
<b>Centre</b>	05 - Escuela Tecnica Superior de Ingenieros Industriales
<b>Academic year</b>	2020-21

## 2. Faculty

---

### 2.1. Faculty members with subject teaching role

<b>Name and surname</b>	<b>Office/Room</b>	<b>Email</b>	<b>Tutoring hours *</b>
Miroslav Vasic (Subject coordinator)		miroslav.vasic@upm.es	--

\* 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

- Theory of electromagnetism
- Theory of electric circuits

## 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

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

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

CE01 - Comprender, diseñar y analizar sistemas y componentes electrónicos en el ámbito de la electrónica industrial. Modelización y caracterización de sistemas electrónicos complejos.

CE04 - Utilización de herramientas CAD para la simulación, modelado y diseño de circuitos electrónicos industriales con altas prestaciones y/o restricciones

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.

CG03 - Saber evaluar y seleccionar la teoría científica adecuada y la metodología precisa de sus campos de estudio para formular juicios a partir de información incompleta o limitada incluyendo, cuando sea preciso y pertinente, una reflexión sobre la responsabilidad social o ética ligada a la solución que se proponga en cada caso.

CT01 - Uso de la lengua inglesa

## 4.2. Learning outcomes

RA55 - Analizar y diseñar circuitos electrónicos analógicos y de potencia, teniendo en cuenta los principales parámetros que definen su funcionamiento

RA56 - Aplicar y adaptar tecnologías de electrónica analógica y de electrónica de potencia a sistemas reales, teniendo en cuenta las restricciones impuestas por la aplicación

\* 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

The subject is considered as a continuation of the courses such as Analog Electronics and Power Electronics that are taught in undergraduate courses. The main idea of the course is to give a quick overview of basic electronic circuits and to apply theoretical circuits to real systems. Therefore it is necessary to modify the classic circuits to take into account different aspects such as electromagnetic noise, common mode and differential mode coupling, parasitic elements, circuit power supply, output impedance, etc.

## 5.2. Syllabus

1. Signal amplification, filters
2. Analog signal processing
3. Power electronics semiconductor devices
4. Power electronics circuits

## 6. Schedule

### 6.1. Subject schedule\*

Week	Face-to-face classroom activities	Face-to-face laboratory activities	Distant / On-line	Assessment activities
1	<b>Theory lecture</b> Duration: 01:00			
2	<b>Problems solving</b> Duration: 01:00	<b>Practical class in laboratory</b> Duration: 01:00		
3	<b>Theory lecture</b> Duration: 01:00	<b>Practical class in laboratory</b> Duration: 01:00		
4	<b>Problems solving</b> Duration: 01:00	<b>Practical class in laboratory</b> Duration: 01:00		
5	<b>Theory lecture</b> Duration: 01:00	<b>Practical class in laboratory</b> Duration: 01:00	<b>Tutoring</b> Duration: 01:00	
6	<b>Problems solving</b> Duration: 01:00	<b>Practical class in laboratory</b> Duration: 01:00		
7	<b>Theory lecture</b> Duration: 01:00	<b>Practical class in laboratory</b> Duration: 01:00		
8	<b>Problems solving</b> Duration: 01:00	<b>Practical class in laboratory</b> Duration: 01:00		
9	<b>Theory lecture</b> Duration: 01:00	<b>Practical class in laboratory</b> Duration: 01:00		
10	<b>Problems solving</b> Duration: 01:00	<b>Practical class in laboratory</b> Duration: 01:00		
11	<b>Theory lecture</b> Duration: 01:00	<b>Practical class in laboratory</b> Duration: 01:00		
12	<b>Problems solving</b> Duration: 01:00			
13	<b>Clase de teoría</b> Duration: 01:00			
14	<b>Clase de problemas</b> Duration: 01:00		<b>Tutoring</b> Duration: 01:00	

15	<b>Clase de teoría</b> Duration: 01:00			
16				<b>Final exam</b>  Continuous assessment and final examination Presential Duration: 02:00
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.



## 7. Activities and assessment criteria

### 7.1. Assessment activities

#### 7.1.1. Continuous assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
16	Final exam		Face-to-face	02:00	100%	5 / 10	CG02 CE04 CG03 CT01 CB07 CE01 CB10 CB06

#### 7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
16	Final exam		Face-to-face	02:00	100%	5 / 10	CG02 CE04 CG03 CT01 CB07 CE01 CB10 CB06

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

No se ha definido la evaluación extraordinaria.

## 7.2. Assessment criteria

Lo nota final estará basada en el examen final.

## 8. Teaching resources

---

### 8.1. Teaching resources for the subject

Name	Type	Notes
slides	Bibliography	
internet information	Web resource	