

GENERAL INFORMATION

Data of the subject	
Subject name	Power Electronics Applications
Subject code	DEA-GITI-448
Mainprogram	Bachelor's Degree in Engineering for Industrial Technologies
Involved programs	Grado en Ingeniería en Tecnologías Industriales [Fourth year]
Level	Reglada Grado Europeo
Quarter	Semestral
Credits	4,5 ECTS
Туре	Optativa (Grado)
Department	Department of Electronics, Control and Communications
Coordinator	Pablo García González
Schedule	Morning sessions

Teacher Information

Teacher		
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Teacher		
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DESCRIPTION OF THE SUBJECT

Contextualization of the subject	
Prerequisites	
Students must have taken a course on electric circuit analysis, and have basic knoledge of Fourier Series and control systems.	



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Contents		
Theory:		
1. Introd	uction.	
o	What power electronics is and application examples.	
o	Principles of energy conversion using power electronics.	
o	Analysis of circuits with periodic voltage and current sources.	
o	Power quality: definition of the most important concepts and electrical magnitudes.	
2. AC-DC	converters.	
o	Introduction: power diode switching principles.	
o	Single-phase rectifiers.	
o	Three-phase rectifiers.	
o	Application example: HVDC system.	
3. DC-AC	converters.	
o	Introduction: power transistor switching principles.	
o	Single-phase inverter: square wave and Pulse Width Modulation (PWM).	
o	Three-phase inverter: square wave and Pulse Width Modulation (PWM).	
o	Park's Transformation and current control.	
o	Application example: control system of a STAtic synchronous COMpensator (STATCOM).	
4. DC-D0	C converters.	
o	Operation principles.	
0	Basic converters: Buck, Boost and Buck-Boost converter.	
Laboratory:		

EVALUATION AND CRITERIA

current probes and signal filters.

Grading

Grading

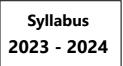
The following conditions must be accomplished to pass the course:

- A minimum overall grade of at least 5 over 10.
- A minimum grade in the final exam of 4 over 10.

The overall grade is obtained as follows:

• Final exam 50%.





- Quizzes 30%: two or three 50-min quizzes.
- Lab evaluation 20%.

BIBLIOGRAPHY AND RESOURCES

Basic References

D.H. Hart. Power Electronics. McGraw-Hill, 2010.

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