

Specification for the book of courses

Study program		Electrical Power Engineering		
Module		Electrical Power Engineering		
Type and level of studies		Master studies		
The name of the course		Power Converters for Renewable Energy Sources		
Lecturer (for lectures)		Petronijević P. Milutin		
Lecturer/associate (for exercises)		Filipović R. Filip		
Lecturer/associate (for OFE)				
Number of ECTS	5	Course status (obligatory/elective)	Elective	
Prerequisites	None			
Course objectives	Acquiring the basic knowledge and skills needed to design grid-side converters: selection of semiconductor and passive devices, design and realization of control circuits.			
Course outcomes	Providing relevant knowledge for analysing and designing grid-side converters used in renewable energy sources. Mastering the skills of using software tools for converters programming and components sizing.			
Course outline				
Theoretical teaching	Control oriented modelling of converters: average model, linearization, detailed models. Pulse width modulation, Space vector PWM. Passive components sizing and selection, Acquisition of the Feedback Signals. Current Control: synchronous frame and proportional-resonant controllers. Voltages and power flow control. Synchronization of the grid-side converter. Disturbance Rejection			
Practical teaching (exercises, OFE, study and research)	Numerical exercises: design of linear controllers; parameters calculation; examples of passive components sizing; controllers testing and performance verification. Student seminar work with practical exercises in laboratory.			
Textbooks/references				
1	S. N. Vukosavic, "Grid-side converters design and control: Interfacing Between the AC Grid and Renewable Power Source", Springer, 2018			
2	M. Kazmierkowski, R. Krishnan, F. Blaabjerg, "Control in Power Electronics: Selected Problems", Academic Press, 2002			
3	Remus Teodorescu, Marco Liserre, Pedro Rodríguez, "Grid Converters for Photovoltaic and Wind Power Systems," Wiley, 2011.			
4				
5				
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
2	2	0		
Teaching methods	Numerical exercises: design of linear controllers; parameters calculation; examples of passive components sizing; controllers testing and performance verification. Student seminar works supported with practical exercises in laboratory.			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam	Points	
Activity during lectures		Written exam		
Exercises		Oral exam	40	
Colloquia				
Projects	60			