

Specification for the book of courses

Study program		Electrical Engineering and Computer Science		
Module		Common		
Type and level of studies		Doctoral studies		
The name of the course		Measurement and Information Technologies		
Lecturer (for lectures)		Denić B. Dragan		
Lecturer/associate (for exercises)				
Lecturer/associate (for OFE)				
Number of ECTS	10	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives		Mastering the general hardware-software structure of the measurement-information systems, as well as individual blocks. Understanding the influence of applied techniques on the accuracy of measurement.		
Course outcomes		Ability to design individual instruments with the application of measurement-information technologies, as well as the system as a whole. Ability to understand user requirements, select components, design individual circuits, and analyze the achieved metrological parameters.		
Course outline				
Theoretical teaching		General models of the measurement process. Sources of measurement data and metrological parameters of measurement signals. Microelectronic circuits for the processing of measurement signals. Components for analog-digital conversion of measurement signals (multiplexers, samplers, ADC, DACs) and indicators. Architecture and hierarchical organization of software for measurement systems. Universal acquisition cards. Measurement-information electronic modules (DAQ, DAS). Standard interfaces. Intelligent and virtual measurement instruments. Principles of calibration of measurement modules and systems.		
Practical teaching (exercises, OFE, study and research)				
Textbooks/references				
1	Burns, M., Roberts, G.W., "Mixed-Signal IC Test and Measurement", Oxford Univ. Press, New York, 2001.			
2	Barney, G.C., "Intelligent Instrumentation", Prentice Hall, New York, 1998.			
3	National Instruments, "Measurement and Automation Catalog", National Instruments Catalog.			
4	Horn, G., Huijising, J., "Integrated smart sensors, design and calibration", doctoral diss., Delft, Kluwer Academic Publisher, Netherlands, 1998.			
5				
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
3	0	0	0	0
Teaching methods		Lectures with the use of modern presentation tools. Work in the laboratory within the framework of the research tasks. Working on defined project tasks. Inclusion in the process of writing and presenting scientific papers.		
Grade (maximum number of points 100)				
Pre-exam duties		Points	Final exam	Points
Activity during lectures			Written exam	
Exercises			Oral exam	50
Colloquia				
Projects		50		