

## Specification for the book of courses

<b>Study program</b>		Electrical Engineering and Computer Science		
<b>Module</b>		Electronics		
<b>Type and level of studies</b>		Undergraduate Academic Studies		
<b>The name of the course</b>		Metrology of Electrical Quantities		
<b>Lecturer (for lectures)</b>		Denić B. Dragan, Simić M. Milan		
<b>Lecturer/associate (for exercises)</b>		Jocić V. Aleksandar, Đorđević-Kozarov R. Jelena		
<b>Lecturer/associate (for OFE)</b>		Miljković S. Goran, Milenković V. Vladeta		
<b>Number of ECTS</b>	6	<b>Course status (obligatory/elective)</b>	Elective	
<b>Prerequisites</b>	No			
<b>Course objectives</b>	Education and introduction of students with basic theoretical and practical knowledge from the field of metrology and measurement of electrical quantities.			
<b>Course outcomes</b>	Training and capability of students for solving the practical problems from area related to the measurement of electrical quantities, on the basis of good knowing the measurement methods and techniques, with proper use of modern instruments and equipment for measurement of electrical quantities. Also, important segment is training of students for lather application of acquired knowledge about measurement techniques in engineering professions from the fields of electrical engineering and computer science.			
<b>Course outline</b>				
<b>Theoretical teaching</b>	Basics of measurement theory - metrology. Electrical quantities and measurement units. Standards of measurement units ampere, ohm and volt in MKSA system (etalons and norms). Structural schemes of process for measurement of electrical quantities. Methods for measurement of electrical quantities. Processing of measurement results and measurement uncertainty. Metrological characteristics of electrical measuring resources. Analog and digital measurement instruments. Instrument with the moving coil. Expansion of measurement range for ammeter, voltmeter and ohmmeter. Measuring converters of electrical quantities. Oscilloscopes.			
<b>Practical teaching (exercises, OFE, study and research)</b>	Computational, laboratory and demonstration exercises: training of students for solving the computational tasks from measurement of electrical quantities, also for practical use of measurement methods and measurement instruments, through engagement on laboratory and demonstration exercises. According to the Manual for work on laboratory exercises, students submit appropriate report about each completed laboratory exercise.			
<b>Textbooks/references</b>				
1	B. Dimitrijević, "Electrical measurements" (in Serbian), intended textbook, Naucna knjiga, Belgrade.			
2	B. Dimitrijević, D. Denić, G. Đorđević, "Electrical measurements - Collection of tasks with Manual for work on laboratory exercises" (in Serbian), Faculty of Electronic Engineering, Niš.			
3	P. Pravica, I. Bagarić, "Metrology of Electrical Quantities - General Part" (in Serbian), Nauka, Belgrade.			
4	S. Tumanski, "Principles of Electrical Measurements", Taylor & Francis Group, 2006.			
5	Material for lectures on the faculty website: Lectures for subject Metrology of Electrical Quantities.pdf (in Serbian) ( <a href="http://www.elfak.ni.ac.rs">www.elfak.ni.ac.rs</a> ).			
<b>Number of classes of active education per week during semester/trimester/year</b>				
<b>Lectures</b>	<b>Exercises</b>	<b>OFE</b>	<b>Study and research work</b>	<b>Other classes</b>
2	2	1	0	0
<b>Teaching methods</b>	Lectures (theoretical teaching) with graphical presentation of material in the form of slides. Computational exercises with solving of tasks related to the measurement of electrical quantities. Practical teaching in the form of laboratory and demonstration exercises. Everyday consultations for students with teacher or assistants. Individual work of students in the form of homework tasks exercise.			
<b>Grade (maximum number of points 100)</b>				
<b>Pre-exam duties</b>	<b>Points</b>	<b>Final exam</b>		<b>Points</b>
<b>Activity during lectures</b>	10	<b>Written exam</b>		20
<b>Exercises</b>	10	<b>Oral exam</b>		20
<b>Colloquia</b>	40			
<b>Projects</b>	0			