

## Specification for the book of courses

<b>Study program</b>		Electrical Engineering and Computer Science		
<b>Module</b>		Electrical Power Engineering		
<b>Type and level of studies</b>		Undergraduate Academic Studies		
<b>The name of the course</b>		Power Transformers		
<b>Lecturer (for lectures)</b>		Petronijević P. Milutin		
<b>Lecturer/associate (for exercises)</b>		Kostić Z. Vojkan, Banković G. Bojan		
<b>Lecturer/associate (for OFE)</b>		Kostić Z. Vojkan, Banković G. Bojan		
<b>Number of ECTS</b>	6	<b>Course status (obligatory/elective)</b>	Obligatory	
<b>Prerequisites</b>	None			
<b>Course objectives</b>	Acquiring the basic knowledge about power transformers, their application in power networks and industry.			
<b>Course outcomes</b>	Mastering the techniques for selection of power transformers in respect to plant characteristics; the ability of analysis and prediction of behavior of transformers in various operational modes; monitoring, testing and maintenance.			
<b>Course outline</b>				
<b>Theoretical teaching</b>	Power transformers construction and principle of operation. Basic concepts of magnetic circuits. Single-phase transformer. Equivalent circuit. Parameters. Power losses and efficiency. No-load and Short-circuit tests. Windings connections. Paralel operations. Autotransformers. Special transformers. Instrument transformers. Transformers heating. Unsymmetrical operation. Transients. Overvoltages. Basics of power transformers design. Maintance and testing.			
<b>Practical teaching (exercises, OFE, study and research)</b>	Numerical exercises cover examples in calculation of power transformers operation, relevant for practical application. In Laboratory, experiments are include: Basic tests on power transformers, Windings connections of transformers, No-load and short circuit tests in laboratory. Parallel operation of transformers, Computer simulation of transient regimes, Power transformer efficiency measurement.			
<b>Textbooks/references</b>				
1	John Winders, "Power Transformers: Principles and Applications", CRC Press, 2002			
2	J. Harlow, "Electric power transformer engineering", 3rd Edition, CRC Press, 2012.			
3	Dj. Kalić, R. Radosavljević "Transformers", Institute for textbook publishing and teaching aids, Belgrade, 2001, (in Serbian)			
4	P. Matić, "Electric machines I", Academic mind, Belgrade, 2016, (in Serbian)			
5	Đ. Vukić, Ž. Milkić, Z. Stajić, "Transformers - workbook", FEE Priština, 1998 (in Serbian).			
<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 with application of demonstrative aids – slides, simulations and details of transformers and electrical machines. Auditory exercises with numerical examples refers students to solve problems from engineering practice independently. Standalone laboratory exercises with the aid of Laboratory Exercise manuals and lecturer advice. Students should write reports for each laboratory 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>	5	<b>Written exam</b>		20
<b>Exercises</b>	15	<b>Oral exam</b>		20
<b>Colloquia</b>	40			
<b>Projects</b>				