

## 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>		Alternating Current Machines		
<b>Lecturer (for lectures)</b>		Stajić P. Zoran		
<b>Lecturer/associate (for exercises)</b>		Radić M. Milan		
<b>Lecturer/associate (for OFE)</b>		Radić M. Milan, Banković G. Bojan		
<b>Number of ECTS</b>	7	<b>Course status (obligatory/elective)</b>	Obligatory	
<b>Prerequisites</b>				
<b>Course objectives</b>	Learning basic knowledge of induction and synchronous electric machines and their applications.			
<b>Course outcomes</b>	The ability to analyze the operation of induction and synchronous electric machines in steady state operation and to perform basic laboratory experiments. Knowing the performance characteristics of induction and synchronous machines.			
<b>Course outline</b>				
<b>Theoretical teaching</b>	Elements of the construction and classification of induction machines. Principle of operation. Energy balance. Modes of operation. Physical image and vector diagram. Equivalent circuit. The expression for the electromagnetic torque and mechanical characteristics. Stability of operation. The influence of the parameters and supply. Two-speed IM. Reactive power compensation of IM. Elements of the construction and classification of synchronous machines. Modes of operation. Armature reaction. Vector diagrams. Analysis of the performance. The expressions for active and reactive power. Control of active and reactive power. Stability of operation. Parallel operation. Performance characteristics of synchronous machines. Special modes of operation.			
<b>Practical teaching (exercises, OFE, study and research work)</b>	Problems following lectures are solved on auditory exercises, including practical examples of calculations from engineering practice. Laboratory exercises are performed on real machines, including elements of design, interpretation of data from the nameplate, measuring of winding resistance and transformation ratio of induction motor with wound rotor, the no-load and short-circuit test of three-phase induction motor, starting of a three-phase induction motor, synchronous machine synchronization the power grid and recording „V” curves of a synchronous motor.			
<b>Textbooks/references</b>				
1	Z. Stajić, Đ. Vukić, M. Radić, „Induction Machines“, Faculty of Electronic Engineering, Niš, 2012. (In Serbian)			
2	B. Mitraković, „Synchronous Machines“, Scientific book, Belgrade, 1991. (In Serbian)			
3	Đ. Vukić, Z. Stajić, M. Radić, „Induction Machines – solved problems“, Academic mind, Belgrade, 2004. (In Serbian)			
4	Đ. Vukić, A. Čukarić, Ž. Milkić, „Synchronous Machines – solved problems“, Academic mind, Belgrade, 2007. (In Serbian)			
5	A.E. Fitzgerald, Charles Kingsley, JR., Stephen D. Umans, „Electric Machinery“, McGraw-Hill 2003.			
<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>
3	2	1	0	0
<b>Teaching methods</b>	Lectures and auditory exercises are performed on blackboard; Laboratory exercises are performed on real machines where students work independently, with supervision. Consultations.			
<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>	25	
<b>Exercises</b>	5	<b>Oral exam</b>	25	
<b>Colloquia</b>	40			
<b>Projects</b>				