

Course title:		Special electric machines		
Course code	Course status	Semester	Number of ECTS credits	Lecture hours
PA5201	Mandatory	II	5	3L+1E
Study program: Master studies, ELECTRICAL ENGINEERING, study program: Power systems and Control, department: Industrial electronics (studies last for 10 semesters, 300 ECTS credits). Postgraduate studies, ELECTRICAL ENGINEERING, study program: Power systems and Control, department: Industrial electronics (studies last for 8 semesters, 240 ECTS credits)				
Prerequisites: No prerequisites required.				
Course aims: Students will be introduced with small power motors which have wide application in industry, robotic and automatic. Construction, work principles, basic characteristics in steady and transient state, speed and moment regulation as well as control of this motor will be analyzed.				
Teacher(s) first and last names: PhD Milutin OSTOJIĆ, dipl. ing. - Professor, MSc Boris MARKOVIĆ, dipl.ing. - assistant				
Studying method: Lectures, exercises and consultations				
Course synopsis				
Preliminary week	Preparation and semester enrolment.			
I week	Introduction. Types of special electric machines. DC motors with permanent magnets (DCMWPM).			
II week	Speed regulation of DCMWPM, transient processes, transfer function, application (I test)			
III week	Universal collector motor, construction, work principle, characteristics, speed regulation, applic.			
IV week	Small power induction motors, capacitive motor.			
V week	Induction servomotors, types, moment, control, transfer functions (II test)			
VI week	I colloquium.			
VII week	Free week.			
VIII week	Synchronous micro-motors, motors with permanent magnets, reluctant, reduction motors.			
IX week	Control of synchronous motor with permanent magnet (III test)			
X week	Step motors. Control of step motors. Application.			
XI week	Brushless DC motors, construction, work principles, characteristics, control (IV test)			
XII week	II colloquium.			
XIII week	Switching reluctant motors, construction, work principles, characteristics, control (V test)			
XIV week	Tacho-generators.			
XV week	Correction of one colloquium.			
XVI week	<i>Final exam</i>			
Final week	Administrative procedures.			
XVIII-XXI week	Additional lessons, correction of the final exam and administrative procedures.			
STUDENT WORKLOAD				
<u>per week</u>		<u>per semester</u>		
Working hours: 5 credits x 40/30 = 6 hours and 40 minutes.		Teaching and the final exam: (6hours and 40 minutes) x 16 = 106 hours and 40 minutes.		
Working hours structure: 3 hours for teaching 1 hour for exercises 2 hours and 40 minutes for individual work, including consultations.		Necessary preparation (before semester): 2 x (6hours and 40 minutes) = 13hours and 20 minutes.		
		Total work hours for the course: 150hours		
		Additional hours for preparing correction of the final exam, including the exam taking: up to 30hours.		
		Work hours structure: 106hours and 40 minutes (lectures) + 13hours and 20 minutes (preparation) + 30hours (additional work)		
Lessons and laboratory exercises attendance is mandatory for students, as well as doing test and colloquiums.				
Literature: M. Ostojic, Bilješke sa predavanja; M. Djurović, G. Joksimović, Specijalne električne mašine; T. Miller, Swiched Reluctance Motors and Their Control, Magna Physics Publishing, 1993; R. Krishnan, Electric Motor Drives- Modeling, Analysis, and Control, Prentice Hall, 2001. T. Kenio, Stepping Motors and Their Microprocessor Controls, Clarendon Press,Oxford,1984				
The forms of knowledge testing and grading:				
- Tests 10 points,				
- Colloquium 2x20 points (total 40 points)				
- Final exam 50 points.				
Student gets the passing grade by collecting 50 points at least.				
Special remarks for the course: Lectures are performed for groups of 40 students.				
Teacher(s) who provided the information: PhD Milutin OSTOJIĆ				
Note: -				