

| | | Course title <i>Models and dynamics of electrical machines</i> | | |
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| Course code | Course status | Semester | Number of ECTS credits | Lecture hours |
| PA5101 | Mandatory | I | 5 | 2L+1E+1Lab |
| 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: Rotation machines | | | | |
| Course aims: Students will be introduced with mathematical models of DC, synchronous and induction machine. Characteristic transient processes in individual machines based on these models are analyzed analytically and numerically in visual program C++ and Simulink. | | | | |
| Teacher(s) first and last names: <i>PhD Milutin Ostojić, MSc Milanka Žugić, MSc Boris Marković</i> | | | | |
| Studying method: Lectures, exercises and consultations. | | | | |
| Course synopsis: | | | | |
| Preliminary week | Preparation and semester enrolment. | | | |
| I week | Introduction. Self and mutual inductivity of lumped and distributed windings. | | | |
| II week | Double energized rotated converter, mathematical model. | | | |
| III week | General electric machine, mathematical model. (I test) | | | |
| IV week | Linear transformations in electric machines. | | | |
| V week | Derivation of DC machine to general machine, mathematical model (II test) | | | |
| VI week | I colloquium. | | | |
| VII week | Free week. | | | |
| VIII week | Transient processes in DC motor. | | | |
| IX week | Derivation of synchronous machine to general machine, mathematical model – Park's equations. (III test) | | | |
| X week | Transient processes in synchronous machines. | | | |
| XI week | Derivation of induction machine to general, mathematical model (IV test) | | | |
| XII week | II colloquium. | | | |
| XIII week | Transient processes in induction machines. | | | |
| XIV week | Analysis of transient processes in electric machines by using Simulink. (V test) | | | |
| 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 attendance is mandatory for students, as well as tests and colloquiums. | | | | |
| Literature: M. Ostojić, <i>Opšta Teorija Električnih Mašina</i> ; R. Krishnan, <i>Electric Motor Drives - Modeling, Analysis, and Control</i> , Pretince Hall,2001. V. Vučković: <i>Opšta Teorija Električnih Mašina</i> , Beograd, 2000. | | | | |
| The forms of knowledge testing and grading: - Tests 5x2 points, - Two 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: Lessons are performed for group of 40 students. | | | | |
| Teacher(s) who provided the information: <i>PhD Milutin Ostojić</i> | | | | |
| Note: - | | | | |