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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Electronic Engineering |
| **GENERAL INFORMATION** |
| Study program  | Electrical Power Engineering |
| Study Module (if applicable) |  |
| Course title | Dynamics of Electrical Drives |
| Level of study | ☐Bachelor x Master’s ☐ Doctoral |
| Type of course | ☐ Obligatory x Elective |
| Semester  |  ☐ Autumn xSpring |
| Year of study  | 1 |
| Number of ECTS allocated | 6 |
| Name of lecturer/lecturers | Mitrović N. Nebojša, Stajić P. Zoran |
| Teaching mode |  xLectures xGroup tutorials ☐ Individual tutorials ☐Laboratory work ☐ Project work x Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| On completion of this course the student will be able to:• demonstrate knowledge and understanding of circuit modelling approach of electrical machines and basic transformations, • analyse, design and implement complex electrical drives with different types of electrical machines, • evaluate the applicability of electrical drives in different configurations and select the optimal control approach to fulfil the user requirements. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Terms and definitions related to the dynamics of electric drives. Electrical drive as a dynamic system. Mathematical model. Simulation methods. Simulation software. Coordinate transformation. Mathematical models of synchronous and induction machines. Transformed models with linear characteristics of core magnetization. Model in current coordinates. Мodels in mixed coordinates. Model in flux coordinates. Examples of trajectories of motion. Start-up during direct connection to network. Reconnection of an motor. Drive reversal. Cyclic load. Soft-start of an induction motor. Power converters model. Voltage source inverter. Current source inverter with pulse width modulation (PWM). Vector and direct torque control of induction and synchronous motor drives. Mathematical model of vector and direct torque control. Realization of the model. Vector control of permanent magnet of synchronous machine. |
| **LANGUAGE OF INSTRUCTION** |
| xSerbian (complete course) ☐ English (complete course) ☐ Other \_\_\_\_\_\_\_\_\_\_\_\_\_ (complete course)☐Serbian with English mentoring ☐Serbian with other mentoring \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **ASSESSMENT METHODS AND CRITERIA** |
| **Pre exam duties** | **Points** | **Final exam** | **points** |
| **Activity during lectures** | **5** | **Written examination** | **30** |
| **Practical teaching** | **15** | **Oral examination** | **20** |
| **Teaching colloquia** | **30** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |