**Electric Drives (ECTS credits: 6)**

Language: the course is offered in English, Serbian and Hungarian.

Contact person: Dr. Lívia Szedmina (slivia@vts.su.ac.rs)

**Course description:**

Firstly, basics of electro-mechanical power conversion are presented: principles of different DC motors, induction motors, synchronous motors, BLDC motors and step motors. As a second step, electronic control of these electro-mechanical power converters is described. Selection criteria of motors and converters are given for different applications.

The following topics are covered:

* Lecture 1. Principles of mechanical components in drives
* Lecture 2. Review of basic electric circuits
* Lecture 3. Understanding of switch-mode power electronic converters in electric drives
* Lecture 4. Magnetic circuits
* Lecture 5. Basic principles of electro-mechanical energy conversion
* Lecture 6. Description of DC motors and brushless DC motors
* Lecture 7. Designing feedback controllers for motor drives
* Lecture 8. AC motors and space vectors
* Lecture 9. Synchronous AC drives
* Lecture 10. Induction motor drives in steady state
* Lecture 11. Speed control of induction motors
* Lecture 12. Vector control of induction motors
* Lecture 13. Speed control of step motors
* Lecture 14. Economy of motor drives
* Lecture 15. Adjusting motor drives to process control

**Aims:**

The goals of the course are the following:

* The students have to get understanding of electro-mechanical power conversion.
* They have to learn the regulation principles of electro-mechanical power converters.
* They have to become familiar with dc motors and their torque speed and position control.
* They have to become familiar with different approaches to the control of synchronous AC and induction motors.
* They will be able to apply step motors and BLDC motors.
* They will be able to construct or select motor drive components.
* They will be able to apply and adjust motor drive modules to a specific application.