



**RIGA TECHNICAL
UNIVERSITY**

FACULTY OF POWER AND ELECTRICAL ENGINEERING

Please note! This is a preliminary list of courses. Changes may occur!

AUTUMN SEM ESTER MASTER COURSES

EEP504 Microprocessors - based Automation Systems 3.00 CP (4.5 ECTS)

The course has been composed for any student who has elementary knowledge in the field of electrical engineering and programming and wish to gain basic practical skills of utilization of microcontrollers MSP430. The course briefly discusses basic design features of microcontrollers MSP430 in the context of various architectures of microprocessors, microcontrollers and peripheral devices. The most significant part of the course is devoted to the programming of MSP430 – including the programming of digital I/O, watchdog and arithmetical operations. The course is based on practical studies and assumes active individual training of the students in the laboratory or at home.

EEP524 Design of Power Electronics Systems 3.00 CP (4.5 ECTS)

The subject is proposed for full and part-time RTU academic master study program „Computerized Control of Electrical Technologies” students. The power electronics system main converter design and calculation are considered. It is described the design and calculation of controllable rectifier, net inverter, DC pulse converter and autonomous inverter power and control schemes.

EEP570 Elements of Automatics 9.00 CP (13.5 ECTS)

Sensors for measurement of electrical and non-electric parameters. Measurements schemes. Synthesis of logical parts of measurement schemes. Functional converters. Characteristics of technical parameters. Indicators of reliability level of the schemes.

EEP572 The Control Systems of Power Electronics Equipment 5.00 CP (7.50 ECTS)

Electronic elements of control systems. Saw-teeth mode voltage, forming of firing pulses. Achieving of the time delay in control systems, phase shifting control, synchronization with network, generators for clock pulses, diversification devices, Pulse Width Modulators, microprocessor based control systems for frequency converters.

EEP583 Industrial Frequency Converters and Inverters 2.00 CP (3.00 ECTS)

Historical overview of AC drive systems development. Mechanical and electrical characteristics of DC and AC drive systems with different speed control methods. Variable frequency AC drives, typical applications and characteristics. Inverters and frequency converters with pulse width modulation techniques. Scalar and vector-oriented control methods of frequency converters.

EEP584 Theory of Electronic Converters of Electrical Energy 4.00 CP (6.00 ECTS)

General theory of energy conversion. Rectifiers and line-frequency controlled inverters. Autonomous inverters. Current-source, voltage-source and resonance mode inverters. Modulation methods. BUCK and BOOST converters. Frequency converters with high-frequency links. Matrix type converters. Cycloconverters.

EEP585 Simulation of Electrical Processes

5.00 CP (7.50 ECTS)

The subject is devoted to simulation of electrical circuits. Principles of composing of differential equation systems for electrical equipment, of their numerical calculation, and its features in MATLAB are given in the first significant part of the course. The second part is devoted to PSPICE circuit description language and to the features of its practical utilization. The theoretical part of the course deals with solutions of ordinary differential equation systems and basics principles of PSPICE. The practical (most important) part of the course includes various examples of simulation of electrical equipment.

EEP433 Automated Electrical Drive

3.00 CP (4.5 ECTS)

Electrical drives and automation by usage of the DC, AC induction and synchronous type motors. Tracking drives, programmable, adaptive and self-organizing systems. Electric magnets, electromagnetic clutches. Choice of the motors and its protection. Reliability of the systems.

EEI701 Effective Lighting

2.00 CP (3.00 ECTS)

The course is focused on lighting issues. The course summarizes the current lighting and electrical systems, as well as explains their operating principle as well as the basic methods of the modern systems of the lighting control and regulation. One of the most important questions connected with the energy saving from the modern lighting systems.

EEA432 Electrical Installation of Buildings

2.00 CP (3.00 ECTS)

Structure of buildings and their construction. Schemes of electric installation and systems of conventional signs. Electrical equipment in household and its control. Selection of electrical devices and mounting technology. Tools and devices for mounting. How to draw up a plan of installation