



## RTU Course "The Control Systems of Power Electronics Equipment"

11103 Department of Industrial Electronics and Electrical Technologies

### General data

Code	EEP572
Course title	The Control Systems of Power Electronics Equipment
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Post-graduate Studies
Course type	Academic
Field of study	Power and Electrical Engineering
Responsible instructor	Ivars Raņķis
Volume of the course: parts and credits points	1 part, 5.0 Credit Points, 7.5 ECTS credits
Language of instruction	LV, EN
Annotation	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.
Goals and objectives of the course in terms of competences and skills	The goal is teach students on matter of principles and methods of practical design of control systems for power converters
Structure and tasks of independent studies	Have to be done 2 design works on realization of control systems of power converters on base of linear amplifiers and microprocessors
Recommended literature	I.Raņķis Energoelektronika. Rīga:RTU, 2004, 159 lpp I.Raņķis, I.Buņina Energoelektronika. RTU, 2007, 187 lpp.
Course prerequisites	Knowledges in power electronics

### Course outline

Theme	Hours
Tasks to be set for control systems of power converters	4
Realization principles of analogue control of controlled rectifiers and realization examples. Laboratory work	6
Principles of cycloconverters analogue control realization and realization examples	4
Microprocessor based control of controlled rectifiers and cycloconverters. Laboratory work	10
Control systems for DC pulse converters and automated regulation of devices	8
Analogue control systems of reversible pulse regulators	4
Control of pulse regulators with microprocessors. Laboratory work	6
Control systems of inverters. Laboratory work	6
Control systems of frequency converters and its realization	6
Control of an active rectifiers and filters and its realization	4
Control methods of frequency converters for AC induction motors	6

### Learning outcomes and assessment

Learning outcomes	Assessment methods
To be able formulate main tasks of control systems for power converters	Defended work on tasks of control systems for converters
To be able design analogue control systems for different power converters	Defended work on tasks of control systems for converters and realization of control on base of linear amplifiers
To be able design microprocessor control systems for different power converters	Defended work on tasks of control systems for converters and realization of control on base of microprocessors

### Study subject structure

Part	CP	Hours per Week			Tests		
		Lectures	Practical	Lab.	Test	Exam	Work
1.	5.0	3.0	0.0	1.0		*	