



## RTU Course "Control Technique with Microprocessor Controllers"

11103 Industriālās elektronikas un elektrotehnol.katedra

### General data

Code	EEP582
Course title	Control Technique with Microprocessor Controllers
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Post-graduate Studies
Course type	Professional
Field of study	Power and Electrical Engineering
Responsible instructor	Leonīds Ribickis
Academic staff	Ainārs Bikšis
Volume of the course: parts and credits points	1 part, 3.0 Credit Points, 4.5 ECTS credits
Language of instruction	LV, EN, RU
Possibility of distance learning	Not planned
Abstract	Process control systems with one and two tanks of capacities. Control loops. Industrial measurement equipment for flow, pressure, level and temperature. Controlled valves, programmable controllers, functions, P, PI, PID control loops, optimal setting techniques.
Goals and objectives of the course in terms of competences and skills	To teach students to realize the automation actuated with Fanuc controllers. Tasks - to teach the process of normalizing technological signals for controller management systems, to teach a process control algorithm and its entering into the computer system, a controller attachments for the technological process.
Structure and tasks of independent studies	Students need to prepare for each laboratory work, made pre-preparation of the algorithms and their possible computer realization with its checking before the lesson by teacher.
Recommended literature	1. Gardener J. W., Varadan V. K., Awadelkarim O. O. Microsensors, MEMS and Smart Devices. Wiley, 2001. 2. Maluf N. An Introduction to Microelectromechanical Systems Engineering. Artech House, 1999. 3. J. A.Rehg, G.J.Sartori Industrial Electronics, Prentice Hall, NY, 2006, 862 p.
Course prerequisites	Industrial electronics, industrial process automation.

### Course outline

Theme	Hours
Technological processes, automation, automation tasks.	2
Technological process parameters, the analogue and digital processing.	2
Microprocessor controller design principles.	2
Microprocessor architecture of the Fanuc controller.	2
Data input and output from the controller Fanuc.	2
Fanuc controller programming.	4
Fanuc controller programming examples.	2
Lab.w. No. 1. Introduction to Fanuc programming language.	4
Lab.w. No. 2. Algoritmization of technological process No.1.	4
Lab.w. No.3. Input of the algorithm of technological process No. 1 on the computer.	4
Lab.w. No.4. Control system test of technological process No. 1.	4
Lab.w. No.5. Elaboration and test of Control system of technological process No. 2.	4
Lab.w. No.6. Elaboration and test of Control system of technological process No. 3.	4
Lab.w. No.7. Elaboration and test of Control system of technological process No. 4.	4
Tests lesson.	4

### Learning outcomes and assessment

Learning outcomes	Assessment methods
Being able to create a processing of digital control algorithm and its computer presentation at given specific controller.	The defense of management of program entered into the computer and controller.
Being able to create a controller Fanuc management of the process automation system.	Defended laboratory works No.4, 5,6,7. Successfully passed the exam.

### Study subject structure

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	3.0	4.5	1.0	0.0	2.0		*	