



RTU Course "Programming Technologies in Industrial Electronics"

11103 Industriālās elektronikas un elektrotehnol.katedra

General data

Code	E EI481
Course title	Programming Technologies in Industrial Electronics
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Undergraduate Studies
Course type	Professional
Field of study	Computer Science
Responsible instructor	Anatolijs Ļevčenko
Academic staff	Mihails Gorobecs
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	Classification of information systems. Intelligent systems of industrial electronics. Object-oriented design. Tasks of the intelligent systems. Solving algorithms. Technology of software design. Life cycle. Flowcharting of the programs. Structure analysis. Synthesis of the programs. Method of Jackson. Testing of software. Testing of basis way. Testing of conditions. Testing of data flux. Testing of cycles. Visual modeling. Object-oriented testing.
Goals and objectives of the course in terms of competences and skills	To study technology of software development. To study analyse system and requirements, design, code and examine it. To consolidate students' knowledge and practical skills in programming.
Structure and tasks of independent studies	Execution of home tasks and laboratory works. Documentation of study project.
Recommended literature	1. Michael Jackson , R.J. Wieringa. Design Methods for Software Systems, Morgan Kaufmann, NY, 2002, 500 p. 2. Don Merusi. Programming the Win32 API and Unix System Services (Microsoft Technologies Series), Prentice Hall PTR, London, 2000, 400 p 3. E-studijas (www.itslatvia.lv)
Course prerequisites	Knowledges on programming languages and computer technologies

Course outline

Theme	Hours
Technology of software design. Classification of information systems.	2
Intelligent systems of industrial electronics. Organization of the design process. Designing prototypes.	2
Tasks of the intelligent systems. Classic life cycle. Flowcharting of the programs.	4
Strategies of software design. Increment model.	4
Fast development of application software. Spiral-type model. Component-oriented model.	4
Classic methods of analysis. Structure analysis. Synthesis of the programs of Varnjē-Orra method. Method of Jackson.	4
Testing of data flux. Description of data and processes flux. Extension of real time systems.	4
Extension of control opportunities. Examples of electric transport systems models. Initial step of modeling.	4
Basic notions and principles software testing. Basis way, testing of	4
Flow-oriented graphs. Testing of conditions. Testing of data flux. Testing of cycles.	2
Object-oriented modeling. Support of the programs. Support request.	4
Object-oriented design. Classification of information systems. Solving algorithms. Visual modeling.	4
Standard of software support IEEE 1219-1992. Definition of support task. Analysis of support task.	4
Designing of support request. Realisation of support request. Control of support request.	2

Learning outcomes and assessment

Learning outcomes	Assessment methods
The students are able to apply methods of analysis, define role of each element in computer system, interoperation of the elements and requirements for each system's element.	Laboratory works in computer class. Analysis of study project system and requirements.
The students can solve the tasks of computer system design, defining the class of the system, its variables and functions.	Laboratory works in computer class. Designing part of the study project
The students can apply object-oriented programming language for the development of computer model of electronic system and examine accuracy of the model operation.	Laboratory works in computer class. Coding and testing parts of the study project. Practical tasks of the exam.
The students are able to define methods of system analysis, describe strategies of software design, distinguish basic principles of software testing, elements of software support.	Theoretical tasks of the exam. Control works on the theoretical materials obtained at the lectures.

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		*	