RTU Course "Advanced Computer Architecture"

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General data

Code	DST464
Course title	Advanced Computer Architecture
Course status in the programme	Compulsory/Courses of Limited Choice
Responsible instructor	Valerijs Zagurskis
Volume of the course: parts and credits points	1 part, 3.0 Credit Points, 4.5 ECTS credits
Language of instruction	LV, EN
Annotation	Trends in computer architecture; modern processors and data communication buses, main principles of their functioning.Trends in the development of computer infrastructure and the most important solutions; modern functioning units and their interfaces. Trends in server and cluster system development. Processor and multiprocessor platforms and their interprocess communication performance evaluation. Processor types of multimedia.
Goals and objectives of the course in terms of competences and skills	To train specialists, which can implement, design, analyse solutions based on computer architecture and infrastructure to enhance the development of various processes
Structure and tasks of independent studies	Requirements for students to prepare for practical assignments: all lecture exercises. In practical assignments students should demonstrate their understanding of innovative technologies. Requirements for students to prepare for practical classes: Before performing practical exercises a student must write the theoretical part of the report. Before the next lecture it is recommended repeating material from a previous lecture to be able to actively participate in classroom discussions. The assessment principles of study course acquisition - grade: Based on a ten-point grading system student's theoretical and practical skills are assessed.
Recommended literature	1Don Yentes and oth., Systems Analysis and Design PITMAN Publishing, 1994, 420 pp., ISBN 0-2736-0066-4. 2.J.Hennesy, D. Patterson, Computer architecture, 2007 by Elsevier Inc.,621pp., ISBN13: 978-0-12-370490-0, 3. D. Patterson, J.Hennesy, Computer Organization and Design, 2007 by Elsevier Inc., 623pp, ISBN:978-0-12-370606-5, 4. Lekciju konspekti.
Course prerequisites	Introduction to computer architecture

Course contents

Content	Full- and part-time intramural studies		Part time extramural studies	
	Contact Hours	Indep. work	Contact Hours	Indep. work
Computer architecture abstractions and platforms	2	0	0	0
Computer classification based on different applications	2	0	0	0
Methods for performance evaluation	4	0	0	0
Hardware platform technical description	2	0	0	0
Advanced principles of computer memory organization	4	0	0	0
Multiprocessor architecture and problems of cache memory coherence	2	0	0	0
Advanced computer I/O subsystem infrastructure	2	0	0	0
SUN Microsystem architecture SPARC and its properties	2	0	0	0
Hewlett Packard PA-RISC processor	2	0	0	0
MIPS processor architecture and properties	2	0	0	0
IBM Power architecture and AMD processor properties by Motorola, Apple	6	0	0	0
High-level readiness and fault-tolerant computer architecture	8	0	0	0
Cluster solutions of computer systems	4	0	0	0
Multiprocessor interconnection networks	6	0	0	0
Total:	48	0	0	0

Learning outcomes and assessment

Learning outcomes	Assessment methods
Able to discuss the basic principles of computer architecture, main advantages and limitations; to demonstrate the knowledge of basic elements and technology life cycles.	Positively assessed examination that includes both theoretical questions and case studies to formulate proposals for improving controlled processes by means of computer architecture and technology implementation.
Able to access the necessity for network architecture implementation (non-implementation) depending on the type of production (business) process	Process improvement plan drawn up in case studies by means of ready-made technology components.

By means of corresponding tools, a student is able to use ready-made methods and models to choose the methods relevant to the aims set	Positively assessed practical assignment.

Study subject structure

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