



RIGA TECHNICAL
UNIVERSITY

Faculty of Computers Science and Information Technology

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

SPRING SEMESTER

BACHELOR COURSES

Code	Course name	CP	ECTS
DSP201	Database Management Systems	4.0	6.0
<p>Concepts of database (DB) technology. DB management systems (DBMS) and their functionality. DBMS types. Possibilities and restrictions of relation DB. DB data definition languages. Query languages SQL and QbE. Application design in DB systems. Tools of programming automatization. DBMS programming languages. Data exchange standards. Main principles of DB design.</p>			
DMS214	Random Processes	2.0	3.0
<p>Definition and application of random process. Multivariate distributions. Correlation theory. Classification of processes. Stationary processes. Markov chain with discrete and continuous time. Markov processes. Gaussian processes. Imitation of random processes.</p>			
DOP201	Introduction to Operations Research	3.0	4.5
<p>Operations Research is a very important field of study, which is closely related to business applications. It combines the three broad disciplines of Mathematics, Computer Science, and Business Applications. The study course presents the most important operations research problems and diversity of the addressed methods; provides knowledge about possibilities of using the theoretical models in real situations and quantitative analysis of systems.</p>			
DPI230	Object-Oriented Programming	3.0	4.5
<p>This course covers object-oriented (OO) programming concepts and techniques using C++ language as an example. After completing the course students will understand the basic principles of OO programming and obtain OO programming skills. OO basic concepts - abstraction, encapsulation, inheritance and polymorphism are discussed as well as practical programming issues, including class hierarchy formation, an exception handling, templates, etc. Comparison of C++ with some other OO programming languages (eg C # or Java) is also given. During laboratory work students must demonstrate theoretical knowledge and acquire programming skills.</p>			
DSP341	Fundamentals of Computer Systems Design	2.0	3.0
<p>Systems lyfe cycles and design. Stages of system design. Top down and bottom up design strategies. Traditional and advanced approaches to Subject help to understand tasks of system designing and place in the system development' s process. Students form project team, led by a student. The group consists of subgroups which are also conducted by the students. Students' task is to establish requirements for designed system, design it and realize at least in the prototype' s level. The system has a real customer, and all student activities proceed in natural conditions of the systems designing. Subject also includes the theoretical aspects of the systems designing: upward and downward designing, traditional and modern methods of the system designing, different types of the system designing.</p>			
DIP321	Algorithms and Methods of Programming	2.0	3.0
<p>The aim of the course is to develop algorithmzation skills, practical software development. Topics covered by the course include: Definition of algorithm. Parts of algorithm theory. Algorithms and software. Communication and synchronization between running algorithms.</p>			
DIP392	Applied System Software	2.0	3.0
<p>The issues of Applied Software development and practical application are considered. Concepts of building different AS are discussed: transport information systems, banks and insurance information systems, etc. Special attention is paid to the use of design patterns, components and semantic web in AS development process.</p>			
DIP383	Software Engineering	2.0	3.0
<p>The issues of Applied Software development and practical application are considered. Concepts of building different AS are discussed: transport information systems, banks and insurance information systems, etc. Special attention is paid to the use of design patterns, components and semantic web in AS development process.</p>			
DOP319	Computer Networks	3.0	4.5

Computer networks and computer technology. ISO OSI model. Local networks and their communication. Organization of network working places, communication channels, modems. Basic network services. Electronic mailing systems. Addressing in electronic mailing systems, office management on the basis of electronic mail. Design of network working place.

<u>DIM707</u>	Discrete Mathematics	3.0	4.5
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Topics covered by the course include: sets, mappings, relations; combinatorics; boolean algebra; discrete circuits, automata.

<u>DIP203</u>	Data Structures	3.0	4.5
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Concept and classification of data structures. Abstract data structures. Basic data structures. Linear data structures: arrays, lists, tables, stacks, queues. Non-linear data structures: trees and graphs. Logical and physical data structures. Pointers and lists. Simple linked list specification, representation and design. Double linked lists and their usage.

<u>DIP108</u>	Algorithmization Practice	2.0	3.0
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Students get practical skills in algorithm development and additional skills in algorithmization helping them to successfully complete computer studies courses. The course covers different types of algorithm representations and basics of algorithm analysis methods.

<u>DSP332</u>	Fundamentals of Artificial Intelligence	3.0	4.5
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Artificial intelligence is a sub-field of computer science that deals with the design and development of computer systems that possess characteristics (ability to solve problems, represent knowledge, infer, learn, etc.) that are related to the intelligence in human behaviour. Today, the development of artificial intelligence methods, technologies and applications is very rapid: self-driving vehicles, chatbots, product recommendation systems, news bots, virtual assistants, neural network-based medical diagnosis, emotionally intelligent tutoring systems, and impressive industrial robots.

Note! Full course description available by clicking on the course code!

MASTER COURSES

(available only to graduate students)

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Code	Course name	CP	ECTS
<u>DPI508</u>	Methods and Evolution Trends of Applied Computer Science	4.0	6.0
<p>This course introduces students to advanced techniques of applied computer sciences. Students are encouraged to analyze information from the Internet, periodic scientific publications and topical information presented in international scientific conferences and symposiums. Thus, students are able to keep track of trends of applied computer science elaboration and to assess their perspectives. Practical work encourages using and developing the latest results and trends of applied computer sciences in the Master Thesis.</p>			
<u>DSP560</u>	Knowledge Management	4.0	6.0
<p>The course describes the notion of knowledge, nature of knowledge, and knowledge types in the context of organizational knowledge management. Students get acquainted with a lifecycle of knowledge management system and practice different tasks of each of the steps of the lifecycle by playing particular roles in knowledge management team(s). Students learn to identify knowledge needs and goals as well as to design methods and tools for meeting the knowledge goals. They get acquainted with approaches to organizational learning and practice knowledge management ethics.</p>			
<u>DSP422</u>	Artificial Intelligence	4.0	6.0
<p>Artificial intelligence is developing towards four goals – to create systems that think or act like humans, as well as systems that think or act rationally. In this course students acquire knowledge about a modern approach to artificial intelligence – development of intelligent agents. The course is focused on properties, environment, architectures and programs of intelligent agents, logical agents, ontologies, planning, uncertain knowledge and reasoning, making simple and complex decisions, inductive learning, learning decision trees, neural networks and reinforcement learning. In development of a course work students must use their theoretical knowledge for implementation of agent based intelligent systems and analysis of their performance.</p>			
<u>DIP414</u>	Computer Aided Solution Processing	4.0	6.0
<p>In the lecture course, students learn elements of supervised machine learning and mathematical optimization with emphasis on regression methods and combinatorial optimization. The course also discusses methods for estimation of machine learning model's predictive performance, feature selection, optimization of model's structure, as well as practical applications of the methods.</p>			
<u>DPI738</u>	Testing and Software Quality	4.0	6.0
<p>The study course provides in-depth expertise in software quality assurance and control solutions, ranging from the basics of software defect detection to the methods of selecting a testing strategy for a specific software product. Students will learn software testing concepts and, based on best practices, will be able to identify activities for checking the quality level of the software product in traditional and agile development. Within the study course, students will practically apply solutions based on best practices and science for manual and automated detection of nonconformities, including those related to security requirements.</p>			

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