FACULTY OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

Please note! This is a preliminary list of courses for the study year 2016/2017. Changes may occur!

SPRING 2017
BACHELOR COURSES

DIP106 Algorithmization and Programming of Solutions (Part 2)
2.00 CP (3.00 ECTS)
Students receive academic knowledge in computer applications, as well as pragmatic skills in development of algorithms, software development and debugging. The acquired knowledge and skills ensure further successful mastering of computer science courses.

DSP201 Database Management Systems
4.00 CP (6.00 ECTS)
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.

DIP321 Algorithms and Methods of Programming
2.00 CP (3.00 ECTS)
The aim of the course is to develop algorithmzation skills, practical software development. Definition of algorithm. Parts of algorithm theory. Algorithms and software. Communication and synchronization between running algorithms.

DIP392 Applied System Software
2.00 CP (3.00 ECTS)
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.

DOP319 Computer Networks
3.00 CP (4.50 ECTS)
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.

DMS214 Random Processes
2.00 CP (3.00 ECTS)
Definition and application of random process. Multivariate distributions. Correlation theory. Classification of processes. Stationary processes. Markov chain with discrete and continuous time. Markov processes. Gussian processes. Imitation of random processes.

DIP381 Operating Systems
3.00 CP (4.50 ECTS)
Conception of Operating System. Tasking and processes. Process coordination and synchronization. Physical and virtual memory organization. OS performance evaluation. OS examples - MS DOS, UNIX, OS/2, Windows.

DIM204 Discrete Mathematics
2.00 CP (3.00 ECTS)
Sets, mappings, relations. Combinatorics. Boolean algebra; discrete circuits, automata.

DIP203 Data Structures
3.00 CP (4.50 ECTS)
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.

DOP201 Introduction to Operations Research
3.00 CP (4.50 ECTS)
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.

DPI230 Object-Oriented Programming
3.00 CP (4.50 ECTS)
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.

DIP383 Software Engineering
2.00 CP (3.00 ECTS)
Software life-cycle. Software development paradigms. Requirement analysis and definitions. Software specification. Software design. Evaluation of design quality. User interface. Verification and validation. Testing goal and methods. Testing process: testing of modules, testing of systems, testing strategies. Software maintenance.

DSP342 Methods of Systems Theory
2.00 CP (3.00 ECTS)
Job of a system analyst is directly related to the analysis of different business and technical systems. For this purpose a system analyst must know methods and tools for the identification and describing of characteristics and operating principles of different systems. The main attention of the course is devoted to the development of the systematical thinking of the students by concerning the use of system theory methods in the analysis of different kinds of systems. The following topics are considered during the course: origin of systems science and its specific methods, basic elements of systems thinking, principles of systems classification, cybernetic approach to systems thinking, principles and elements of system control and management, evaluation of system complexity, the role of information and communication in system management, system laws and principles, as well as life cycles. By developing an individual work students must apply theoretical knowledge to the analysis of real world systems.

DSP341 Fundamentals of Computer Systems Design
2.00 CP (3.00 ECTS)
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.

MASTER COURSES

DSP422 Artificial Intelligence
4.0 CP (6.0 ECTS)
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.

DIP414 Computer Aided Solution Processing
4.0 CP (6.0 ECTS)
Supervised machine learning, regression modelling, linear regression, least-squares method, model evaluation, automatic model building, heuristic search, genetic algorithms, genetic programming, nearest neighbour methods, regression trees and their practical applications.

DSP412 Computer System Design scientific seminar
2.0 CP (3.0 ECTS)
Mastering elements of scientific work is one of the integral aspects of master studies. During the scientific seminar students acquire understanding about the essence of master thesis, potential topics of their research and basic principles of presentation of results. In the course students acquire basic principles of analysis and overview of scientific publications which are necessary for the development of master thesis. Students acquire also basics of master thesis structure. Seminars contain questions about scientific writing with the purpose to improve student skills to set forth content and results of their work and to make well-grounded conclusions. Students acquire knowledge about the structure and design of presentations and practically improve their presentation skills.

DPI401 Programming of Processes
4.0 CP (6.0 ECTS)
This course covers process management, theoretical and practical aspects of scheduling and synchronization techniques, including the use of Petri net modeling process. Memory management, including virtual memory and page replacement algorithms, distributed systems management methods and algorithms are also included in the course. Students acquire skills for independent analysis and presentation of the theoretical material.

DSP772 Requirements Engineering: Foundation Level
2.0 CP (3.0 ECTS)
The course complies with the syllabus of Certified Professional for Requirements Engineering - Foundation Level, issued by International Requirements Engineering Board. This Foundation level addresses the needs of IT management, domain experts, systems analysts, and software developers, involved in requirements engineering. The knowledge provided is equally valid for all areas (e.g., embedded system, safety critical systems, classical information systems).

DSP726 SAP Workflow Management
2.0 CP (3.0 ECTS)
SAP is one of the market and technology leaders in business management and software business solutions market. SAP is the biggest application development company in Europe and the fourth biggest in the world. One of the company's top products is SAP enterprise recourse planning system.
The course covers topics related to SAP workflow development, testing and administration. Workflow is an application tool for the business process integration between different technologies and people.
The course includes theoretical lectures and practical lessons organized in computer rooms under teacher supervision. During the course students will go through the full workflow development lifecycle. The course instructor is a representative of Accenture Latvia.