

Master Programme - Computer Science English Language

Structure of the Programme:

The program includes: Mandatory courses (54 credits, including 48 credits in specialty mandatory courses, 6 credits for a master's seminar), preparation and defense of a master's thesis (30 credits), and elective courses (36 credits). In the program for elective courses are offered 108 credits.

Study Courses

Courses	Semester	ETCS
Mandatory Courses		54
Logic for Computer Science and Artificial Intelligence	I	8
Principles of Programming Languages	I	8
Seminar I	I	2
Models of Computation	II	8
Advanced Algorithms	II	8
Seminar II	II	2
Data Mining and Analysis	III	8
Computer Networks and Security	III	8
Seminar III	III	2
Elective Courses		108
Computer Algebra	I	6
Approximation Theory	I	6
Numerical Analysis	I	6
Modelling and Simulation	I	6
Distributed Application Development	I	6
Deep Reinforcement Learning	I	6
Semantic Web Technologies	II	6
Knowledge Representation and Reasoning	II	6
Software Verification	II	6
Expert Systems	II	6
Bayesian and Probabilistic Programming	II	6
Digital Signal Processing	II	6
Graph Algorithms and Computational Geometry	III	6
Neural networks	III	6
Network Modelling	III	6
Operations Research	III	6
Human-Machine Interaction	III	6
Artificial Intelligence Applications	III	6
Internship	III	6
Research Component		30
MSc Thesis	IV	30

Learning Outcomes:

- The graduate has deep knowledge understanding of algorithms and model theory, implementation of programming languages and systems, data mining, protection and processing. Is able to critically understand them;
- The graduate knows how to use computer science to solve practical and theoretical tasks. Is deeply familiar with the computer systems needed for the industry. Has a solid background of problem modeling and implementation;
- The graduate is familiar with research methods and technical literature, knows how to search technical information, prepare a report, write a thesis, and make a presentation;
- By applying the principles of fairness a graduate can do collaborative research, create and use software to solve a given task. Is able to adhere the norms of professional ethics, to maintain academic honesty and standards;
- The graduate is able to use the technical knowledge and skills to safely access, extract and process the needed information;
- For solving complex problems the graduate is able to develop a new approach, create mathematical models, and algorithmic representation, analysis and implementation;
- The graduate can divide a complex problem into subproblems. For each subproblem is able to find a suitable programming paradigm and implement;
- The graduate in compliance with the standards of academic ethics is able to find needed information and prepare a report / article / paper and a small project proposal. He/She has the ability to present the research results to both academic and professional communities;
- The graduate has the ability to work in a team and to conduct his/her own learning independently.

Student Knowledge Evaluation System

The goal of evaluation is to determine student's education results qualitatively in relation to academic program goals and parameters. Student may be assessed orally and/or in a written way.

A student's knowledge and skills are assessed through 100 points grading system. It consists

of midterm and final evaluations, sum of which makes up 100 points.

Grading system allows:

a) Five types of positive grades

- 1) (A) Excellent – 91 and over of maximum point;
- 2) (B) Very good – 81-90 of maximum point;
- 3) (C) Good – 71-80 of maximum point;
- 4) (D) Satisfactory – 61-70 of maximum point;
- 5) (E) Acceptable – 51-60 of maximum point.

b) Two types of negative grades

- 1) (FX) Fail – 41-50 of maximum point, meaning that a student requires some more work before passing and is given a chance to sit an additional examination after independent work;
- 2) (F) Fail – 40 and less of maximum point, meaning that the work of a student is not acceptable and he/she has to study the subject anew.

For the midterm and final evaluations minimal passing grade is set. The final evaluation minimal passing grade must not exceed 60% of final evaluation grade.

Midterm and final evaluation grade distribution, their minimal competence levels and assessment criteria are described in the corresponding syllabus.

Evaluation of research component:

The master's thesis is sent for a review to an international expert of the field (a scientist who holds a doctorate degree and works abroad). In case of a positive review, a defense is scheduled, where the dissertation board evaluates the thesis with a 100-point system. In case of assessment (FX), student is allowed to defend refined master thesis once again next semester. In case of the assessment (F), student is not allowed to present the same master thesis for defense.