

Name of the programme

MOBILE APPLICATION DEVELOPMENT AND GAME DESIGN

Number of ECTS credits for the programme

120

Programme objectives

The Master's Programme «Mobile Applications Development and Computer Games» is aimed at developers in the field of mobile devices software engineering and computer games.

The programme also prepares students for a career in research or continued studies towards a doctoral degree.

Mobile Applications and Computer Games are most dynamic and expansive fields of information technologies. For an individual scholar or professional in the field this means that, as well as having a good understanding of the theoretical and technical foundations of the field, one needs to be able to apply a technology to new challenging problems and integrate it with other technologies.

Aim

The Master's Programme «Mobile Applications Development and Computer Games» offers the opportunity to advanced training in specific and very interesting area of computer science and engineering. It opens up prospects for creative personal development, career opportunities, and the ability for graduates to build their own business.

Students will be able to focus their studies on Mobile Applications and Computer Games areas. The following courses are to be taught: mathematics for information technology, mobile operating systems, mobile networks, parallel programming, software architecture, software testing, development and analysis of requirements, computer security, elements of game theory, computer vision, as well as the economics of mobile and gaming applications, development management.

Learning outcomes for the Programme

The following learning outcomes will serve as measurable skills, abilities and knowledge towards the implementation of the general goal of the program. After successfully completing the curriculum, graduate

- knows the mathematical foundations of building mobile applications and computer games;

- can apply programming technologies for mobile applications and computer games;
- has knowledge about special aspects of software behavior within mobile networks and mobile operating systems, is able to develop interfaces for software interaction with the runtime environment in mobile systems;
- has the skills to identify mobile and gaming applications stakeholders, the skills of developing and analyzing software requirements and specifics;
- knows the features of mobile and gaming applications architecture, is able to develop and modernize it;
- is able to plan and carry out mobile and gaming software testing;
- is able to work in a team of mobile applications and computer games developers, at various positions;
- is able to organize a development team and manage the development of mobile and gaming software and its life cycle;
- has an initial knowledge of the economic aspect of software engineering for mobile and gaming applications.

Content of the Programme

Mathematics for Game and Mobile Development:

Courses		
Code	Title	Volume (ECTS)
	Obligatory Courses	15
1.1	Machine Learning	5
1.2	Computer Vision	5
1.3	Artificial Intelligence	5

Programming for Game and Mobile Development:

Courses		
Code	Title	Volume (ECTS)
	Obligatory Courses	20
2.1	Parallel Algorithms for Multicore Systems	3
2.2	Management of software development and maintenance	3
2.3	System engineering	4
2.4	Testing mobile applications and computer games	4

2.5	Mobile Application Software Engineering	4
2.6	Mobile operating systems	2

Interdisciplinary:

Courses		
Code	Title	Volume (ECTS)
	Obligatory Courses	18
3.1	Mathematical methods in modern information technology	5
3.2	Professional communication in a foreign language	4
3.3	Philological support of professional activities and business communication	2
3.4	Theory and practice of argumentation	2
3.5	Modern theories and technologies of personality development	3
3.6	History of Russia	2

Research Methods and Project Design:

Courses		
Code	Title	Volume (ECTS)
	Obligatory Courses	9
4.1	Economics of mobile applications and computer games	3
4.2	Advanced Information Technology	4
4.3	Project management	2

Professional module: Game Development

Courses		
Code	Title	Volume (ECTS)
	Obligatory Courses	18
5.G.1	Game Theory	3
5.G.2	Computer Game Programming Basics	4
5.G.3	Architecture of Computer Games	3

5.G.4	3D graphics	2
5.G.5	Analysis of the requirements for computer games	3
5.G.6	Game Design Basics	3

Professional module: Mobile Development

Courses		
Code	Title	Volume (ECTS)
	Obligatory Courses	18
5.M.1	Mobile networks	3
5.M.2	Mobile Application Programming Basics	4
5.M.3	Mobile Application Architecture	3
5.M.4	Mobile Security	2
5.M.5	Mobile application requirements analysis	3
5.M.6	Mobile Application Interfaces	3

Internship:

Courses		
Code	Title	Volume (ECTS)
	Obligatory Courses	31
6.I.1	Internship, introductory	2
6.I.2	Internship, technological	8
6.I.3	Internship, research	21

Master thesis

9 ECTS

Educational profiles (if available)

The program contains two training tracks: “Mobile applications” and “Computer games”. The track "Mobile Applications" focuses on the study of disciplines that deal with the processes of development, promotion and maintenance of

applications for mobile devices. The track "Computer Games" is devoted to various aspects of gaming applications life-cycle, from mathematical foundations and creation - to monetization.

Teaching and training methods

Teaching and training methods include lectures, seminars, laboratory classes, research work, individual and group projects, scientific and practical workshops and internships.

Entry requirements

A bachelor's degree with a major in computer mathematics, information technology, software engineering. Alternatively, a bachelor's degree with a minor in computer science or related subject area, with a minimum of 60 ECTS credits in computer-related or mathematics related subjects (e.g. languages programming, algorithms, data structures, databases, software engineering, mathematical analysis, discrete mathematics, statistics, mathematical logic, calculus). The Bachelor's degree should be awarded by an internationally recognized university.

Degree thesis

Program includes mandatory research practice (overall 21 ECTS) and internship (10 ECTS). The thesis encompasses independent work corresponding to 9 ECTS credits. The students are encouraged to carry out their thesis work in their specialization area. Work on a thesis should be supervised by a university lecturer with experience in computer science, mobile applications, or game development.