

Faculty of Information Technology and Cybersecurity

Department of «Computer Engineering»

APPROVED BY  
Vice-rector for academic affairs,  
International Information  
Technology University JSC  
Mustafina A.K.



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6B06110

(Code of Academic Program)

Software Engineering

(Name of Academic Program)

## CATALOGUE OF ELECTIVE DISCIPLINES

2024 entry year

2024

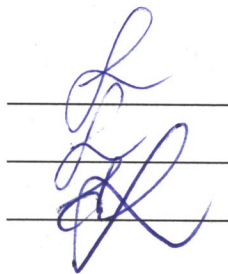
The catalogue of elective disciplines for the specialty/AP 6B06110 Software Engineering is developed on the basis of the working curriculum of the specialty/AP.

The catalogue of elective disciplines was discussed at a meeting of the Computer Engineering department

minutes No. \_\_\_\_\_ from “ \_\_\_\_\_ ” \_\_\_\_\_ 2024

Head of Department

CED compiler



Chinibayeva T.T.

Chinibayeva T.T.

Yemberdiyeva A.B.

The catalogue of elective disciplines was approved at a meeting of the Academic Council of JSC IITU

minutes No. \_\_\_\_\_ from “ \_\_\_\_\_ ” \_\_\_\_\_ 2024

Head of the Department for educational and methodological activities  Ajibayeva A.SH.

## 1 TERMS AND ABBREVIATIONS

1.1 Academic program is a single set of basic characteristics of education, including goals, results and content of training, the organization of educational process, ways and methods for their implementation and criteria for assessing learning outcomes. The content of academic program of higher education consists of three cycles of disciplines - general education disciplines (hereinafter - GED), basic disciplines (hereinafter - BD) and core disciplines (hereinafter - CD). The cycle of GED includes disciplines of the compulsory component (hereinafter - CC), the university component (hereinafter - UC) and (or) the component of choice (hereinafter - COC). BD and CD include disciplines of UC and COC.

1.2 Catalogue of elective disciplines (CED) is a systematic annotated list of all COC disciplines, for the entire training period, containing a brief description indicating the purpose of study, a summary of main sections and expected learning outcomes. CED reflects the prerequisites and postrequisites of each academic discipline. It should provide the students with the possibility of an alternative choice of elective disciplines for the formation of an individual educational trajectory.

On the basis of academic program and CED, the students develop individual curricula with the help of advisers.

1.3 Individual curriculum (IC) is a curriculum formed by the students independently with the help of an adviser for each academic year on the basis of the academic program, the catalogue of elective disciplines or modules;

IC defines an individual educational trajectory of each student separately. It includes disciplines and types of educational activities (internship, experimental research, forms of final certification) of the compulsory component (CC), the university component (UC) and the component of choice (COC).

1.4 Advisor is a teacher who performs the functions of an academic mentor of a student (according to the appropriate academic program), and assists in choosing a learning path (creating an individual curriculum) and mastering the academic program during the training period.

1.5 The university component is a list of compulsory educational disciplines determined by the university independently for the mastering of the academic program.

1.6 The component of choice is a list of academic disciplines and the corresponding minimum amounts of academic credits offered by the university and independently chosen by students in any academic period, taking into account their prerequisites and postrequisites.

1.7 Elective disciplines are educational disciplines that are a part of the university component and the component of choice in the framework of established academic credits, introduced by organizations of education reflecting the individual preparation of students and taking into account the specifics of socio-economic development, the needs of a particular region and established scientific schools.

1.8 Postrequisites are the disciplines and (or) modules and other types of academic work, the study of which requires knowledge, skills and competencies acquired at the end of the study of this discipline and (or) modules;

1.9 Prerequisites are the disciplines and (or) modules and other types of educational work containing knowledge, abilities, skills and competencies necessary for the mastering of the studied discipline and (or) modules;

1.10 Competencies are the ability of the practical use of acquired knowledge and skills in professional activities.



## 2 ELECTIVE DISCIPLINES

No	Cycle of discipline	Code of discipline	Name of discipline	Semester	Number of credits	Prerequisites
<i>3 year</i>						
1	GER	RM6502	Research methodology	6	5	-
2	GER	JUR 6507	Fundamentals safety of life activity and ecology	6	5	-
3	GER	MGT6706	Startups and entrepreneurship	6	5	-
4	GER	JUR 6470	Fundamentals of law and anti-corruption culture	6	5	-
5	GER	FIN6720	Basics of Financial Literacy	6	5	-
6	GER	ECO6006	Economic theory	6	5	-
7	AS	SFT6309	UX/UI development	5	5	ICT6001
8	AS	MIN601	Minor 1	5	5	
9	AS	SFT6311	Front-end development	5	5	SFT6002
10	AS	SFT6313	Mobile technologies and applications(Android)	6	5	SFT6002
11	AS	SFT6328	Development of mobile applications on IOS	6	5	SFT6307
12	AS	MIN602	Minor 2	6	5	
<i>4 year</i>						
13	AS	SFT6314	Full stack development	7	5	SFT6311, SFT6307
14	AS	MIN603	Minor 3	7	5	
15	AS	SFT6376	Microsoft .NET Framework	7	5	SFT6002

### 3 DESCRIPTION OF ELECTIVE DISCIPLINES

<b>Description of discipline</b>	
Code of discipline	RM6502
Name of discipline	Research methodology
Number of credits (ECTS)	5
Course, semester	3,6
Department	CE
Prerequisites	-
Postrequisites	-
Brief course description	The course is devoted to the study of activities aimed at developing students' ability to independent theoretical and practical judgments and conclusions, skills of objective evaluation of scientific information, freedom of scientific research and the desire to apply scientific knowledge in educational activities, including for the diploma project (work).
Expected learning outcomes	-

<b>Description of discipline</b>	
Code of discipline	JUR 6507
Name of discipline	Fundamentals safety of life activity and ecology
Number of credits (ECTS)	5
Course, semester	3,6
Department	CE
Prerequisites	-
Postrequisites	-
Brief course description	Studying ways of safe human interaction with the environment (industrial, domestic, urban, natural), sustainable operation of business facilities (organizations) in emergency situations, issues of protection from negative factors, prevention and elimination of the consequences of natural and man-made emergencies and the use of modern means defeat. Also the course reveals the role of ecology in solving modern economic, social and political problems, as well as the emergence of global environmental problems as a result of human production activities and the responsibility of the world community for them. A very important aspect is also international cooperation to ensure sustainable development. Various areas of practical application of ecology are also considered - natural resources and environmental pollution.
Expected learning outcomes	-

<b>Description of discipline</b>	
Code of discipline	MGT6706
Name of discipline	Startups and entrepreneurship
Number of credits (ECTS)	5



Course, semester	3,6
Department	CE
Prerequisites	-
Postrequisites	-
Brief course description	This course provides an introduction to what a business is, how it works and how to run it. Students will define ownership and processes used in manufacturing and marketing, finance, personnel, and management in business operations.
Expected learning outcomes	-

<b>Description of discipline</b>	
Code of discipline	JUR 6470
Name of discipline	Fundamentals of law and anti-corruption culture
Number of credits (ECTS)	5
Course, semester	3,6
Department	CE
Prerequisites	-
Postrequisites	-
Brief course description	The course outlines the legal, economic, and social foundations of fighting corruption. Throughout the course, students will gain practical knowledge in identifying the peculiarities of state policies, applying international experiences in combating corruption, mastering skills in conflict resolution, and detecting corruption activities using professional ethics and methods. After successful completion of the course, students will gain the following competencies: 1. Understand the measures of legal responsibility for participation in corruption violations. 2. Determine the conflict of interests in the activities of organizations leading to corruption. 3. Analyze the work of organizations using various research methods.
Expected learning outcomes	-

<b>Description of discipline</b>	
Code of discipline	FIN6720
Name of discipline	Basics of Financial Literacy
Number of credits (ECTS)	5
Course, semester	3,6
Department	CE
Prerequisites	-
Postrequisites	-
Brief course description	The course «Basics of Financial Literacy» is aimed at gaining knowledge and skills in the field of personal finance management. As part of the course, students will learn how to use all kinds of financial tools in practice, protect and increase savings, plan a budget competently, gain practical skills in calculating and paying taxes, and correctly filling out tax reports, learn how to analyze financial information and navigate financial products to choose an adequate

	investment strategy.
Expected learning outcomes	-

<b>Description of discipline</b>	
Code of discipline	ECO6006
Name of discipline	Economic theory
Number of credits (ECTS)	5
Course, semester	3,6
Department	CE
Prerequisites	-
Postrequisites	-
Brief course description	The purpose of the course is to study and explain the processes and phenomena of economic life, explain patterns and predict ways to use them.
Expected learning outcomes	-

<b>Description of discipline</b>	
Code of discipline	SFT6309
Name of discipline	UX/UI development
Number of credits (ECTS)	5
Course, semester	3, 5
Department	CE
Prerequisites	Information and Communication Technology
Postrequisites	Diploma project
Brief course description	This course introduces students to the concept of designing systems that are able to interact effectively with humans. The field of Human Computer Interaction involves understanding and creating methods and artifacts that improve human lives, tasks, goals, and social environments through education in design, computer science, and behavioral and social sciences. In this course, students will learn principles of design and human behavior and the empirical research methods used to solve real problems in the design and use of technology. The course also provides students with opportunities to work on their own as well as in small teams to solve design problems and use HCI methods and principles to model the problems, create solutions, and study the impact of their designs.
Expected learning outcomes	After successful completion of the course students will be able to: Define and Discuss: <ul style="list-style-type: none"> <li>- the concept of usability engineering, why and when to use it, why and when usage is justified, and its underlying benefits and principles;</li> <li>- the standard usability tools and methods such as personas and</li> </ul>



	<p>scenarios, competitive analysis, flow diagrams, generalized transition networks, site maps, storyboards, wireframes and mockups;</p> <ul style="list-style-type: none"> <li>- usability-testing methods. This includes understanding the process of planning and preparing a user test, determining and recruiting participants, designing test tasks, scripts, and scenarios, executing a user test, and recording and analyzing user-test data.</li> </ul> <p>Use and Design:</p> <ul style="list-style-type: none"> <li>- HCI tools, methods and concepts to design systems that are able to interact effectively with humans;</li> <li>- the principles of design and human behavior, computer science, and the empirical research methods used to solve real problems in the design and use of technology;</li> <li>- user interfaces from the perspective of the user, creating a design that supports its intended users' existing beliefs, attitudes, and behaviors as they relate to the tasks that the system is being designed to support;</li> <li>- an iterative design process to design interfaces that provide more efficient and satisfying experiences for the user;</li> <li>- design, plan, and conduct usability test and use the results of the test to create recommendations for design improvements and implement those recommendations.</li> </ul>
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<b>Description of discipline</b>	
Code of discipline	MIN601
Name of discipline	Minor1
Number of credits (ECTS)	6
Course, semester	3,6
Department	CE
Prerequisites	-
Postrequisites	-
Brief course description	Additional educational program (minor) - a set of disciplines and (or) modules and other types of educational work, determined by students for study in order to form additional competencies
Expected learning outcomes	-

<b>Description of discipline</b>	
Code of discipline	SFT6313
Name of discipline	Mobile technologies and applications
Number of credits (ECTS)	7
Course, semester	3, 6
Department	CE
Prerequisites	Object-Oriented Programming



Postrequisites	Diploma project
Brief course description	Android programming concepts are reinforced through a set of thematic programming exercises that introduce these topics and incrementally allow the student to build a complex application; that is, programming labs form a set of components that collectively implement a continuous sensing application. The resulting phone app allows user to log their exercises (e.g., walks, runs) and display them on Google maps.
Expected learning outcomes	After successful completion of the course students will be able to: <ul style="list-style-type: none"> <li>– characterize the architecture of mobile applications;</li> <li>– analyze the requirements of mobile applications;</li> <li>– design and develop mobile applications using one application development framework.</li> </ul>

<b>Description of discipline</b>	
Code of discipline	SFT6314
Name of discipline	Full stack development
Number of credits (ECTS)	5
Course, semester	4, 7
Department	CE
Prerequisites	Web Technologies
Postrequisites	Diploma project
Brief course description	A full stack developer is an engineer who can handle all the work of databases, servers, systems engineering, and clients. Depending on the project, what customers need may be a mobile stack, a Web stack, or a native application stack. In fact, “full stack” refers to the collection of a series of technologies needed to complete a project. “Stack” refers to a collection of sub-modules. These software sub-modules or components combined together to achieve the established function while without the need for other modules.
Expected learning outcomes	After successful completion of the course students will be able to: <ul style="list-style-type: none"> <li>– analyze the software requirements;</li> <li>– distribute the tasks between the stack components;</li> <li>– develop the stack components;</li> <li>– test the stack components.</li> </ul>

<b>Description of discipline</b>	
Code of discipline	SFT6328
Name of discipline	Development of mobile applications on IOS
Number of credits (ECTS)	7
Course, semester	3,5

Department	CE
Prerequisites	Application Development Foundation
Postrequisites	Full Stack Development, Diploma project
Brief course description	The student will learn the features of databases and information assurance applications in operation systems iOS; will utilize enterprise information systems to support information security applications; to have basic skills in database administration of enterprise information systems.
Expected learning outcomes	-

Description of discipline	
Code of discipline	SFT6311
Name of discipline	Front-end development
Number of credits (ECTS)	7
Course, semester	3,6
Department	CE
Prerequisites	Application Development Foundation
Postrequisites	Full Stack Development, Diploma project
Brief course description	In this course, students will study in detail the process of creating the client side of the site, namely the layout of the site template and the development of the user interface.
Expected learning outcomes	Upon successful completion, students will be able to: - create modern websites using HTML, CSS and JavaScript; - develop web applications from scratch; - write more efficient web code;

Description of discipline	
Code of discipline	MIN602
Name of discipline	Minor2
Number of credits (ECTS)	5
Course, semester	3,5
Department	CE
Prerequisites	-
Postrequisites	-
Brief course description	Additional educational program (minor) - a set of disciplines and (or) modules and other types of educational work, determined by students for study in order to form additional competencies
Expected learning outcomes	-

Description of discipline	
Code of discipline	MIN603
Name of discipline	Minor3
Number of credits (ECTS)	5
Course, semester	3,5
Department	CE



Prerequisites	-
Postrequisites	-
Brief course description	Additional educational program (minor) - a set of disciplines and (or) modules and other types of educational work, determined by students for study in order to form additional competencies
Expected learning outcomes	-

<b>Description of discipline</b>	
Code of discipline	SFT6376
Name of discipline	Microsoft .NET Framework
Number of credits (ECTS)	7
Course, semester	4, 7
Department	CE
Prerequisites	C# programming language, VB.NET, introduction to SQL databases, web technologies
Postrequisites	Course project
Brief course description	<p>The discipline "Microsoft .NET Framework - Application Development" is included in the university educational program and is intended for students interested in developing software on the Microsoft .NET Framework platform. The course includes learning the basics of technologies and tools used to create modern applications that run on the .NET platform.</p> <p>Within this discipline, students learn the basics of programming on the .NET platform, including the programming languages C# and Visual Basic.NET, as well as the basics of working with the Visual Studio integrated development environment. Students also learn how to build and debug applications that use various .NET components such as Windows Forms, ASP.NET, ADO.NET, WPF (Windows Presentation Foundation) and others.</p>
Expected learning outcomes	<p>After completing the course, students will have:</p> <ul style="list-style-type: none"> <li>- Understanding of the architecture and core components of the .NET Framework, such as the Common Language Runtime (CLR), base classes and libraries;</li> <li>- Understanding of basic OOP concepts such as classes, inheritance, polymorphism and encapsulation;</li> <li>- Knowledge of the basics of using the Visual Studio integrated development environment, including creating projects, debugging and using tools;</li> </ul>