

Faculty «Computer Technology and Cyber Security»
Department of “Radio engineering, electronics and telecommunications”



APPROVED BY

Vice-rector for academic affairs,
International Information
Technology University JSC

Mustafina A.K.
(Signature) (Full name)

“14” 03 2023

M096 – Information and communication technologies

7M06201 – Telecommunication systems and networks

(Name of Academic Program)

CATALOGUE OF ELECTIVE DISCIPLINES

for 2023-year enrollment

2023

The catalogue of elective disciplines for the specialty/AP 7M06201 – Telecommunication systems and networks 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 department “Radio Engineering, Electronics and Telecommunications”

minutes No. 7 from “09” 02.2023.

Head of Department



signature

Bakhtiyarova, Ye.A. C.T.S.

Full name, position, degree

CED compiler



signature

Shapiyeva A., MSc

Full name, position, degree

The catalogue of elective disciplines was approved at a meeting of the Academic Council of “International Information Technology University” JSC minutes No. 3 from «14» 03. 2023.

Head of the Department
for Educational and Methodological Affairs



signature

A. Ajibayeva

Full name, position, degree



MEMO TO MASTER STUDENTS

Dear master's student at the International University of Information Technologies!

In front of you is the Catalog of elective academic disciplines. This is a systematized annotated list of elective academic disciplines. It is compiled with the aim of creating for you the opportunity to independently, quickly, flexibly, and comprehensively form an individual learning path. This is your assistant in creating your individual curriculum.

With credit technology of education, the content of academic program of higher education consists of three cycles of disciplines - general education disciplines (hereinafter - GED), basic disciplines (hereinafter - BD) and Profiling disciplines (PD). 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.

The disciplines of the compulsory component are set by the State Compulsory Education Standard for the specialty and are studied by all undergraduates of this specialty without exception.

Elective academic disciplines are offered to you for study by departments. The entire list of elective academic disciplines will include 2 sections: Mandatory component and Optional component (elective academic disciplines).

Elective disciplines are divided into 2 types:

1. Elective disciplines established by the university.
2. Elective disciplines offered by the university according to study paths and chosen by the master's student.

At the International University of Information Technologies, elective disciplines established by the university include iCarnegie engineering disciplines and disciplines established by the Department of Information Technologies in the GED and BD cycle.

How to choose elective academic disciplines to include in your individual plan using the Catalog?

1. In the List, find the table of your course and semester of study.
2. Understand how many credits the Standard curriculum allocates for elective disciplines.
3. Familiarize yourself with the list of elective academic disciplines. Please note that academic disciplines are combined into elective courses with the corresponding number. From each group of elective disciplines, you can choose only one elective academic discipline.
4. Read the Description of the elective academic disciplines that interest you and make your choice.
5. Check that the number of credits you select matches the number required by the Model Curriculum.

Your advisor will help you choose elective academic disciplines.

1 ELECTIVE DISCIPLINES

Cycle of discipline	Code of discipline	Name of discipline	Sem	Number of credits	Prerequisites	
Basic disciplines						
Elective disciplines						
1st year						
1st term						
Elective group - 1	EEC 7601	Reliability of fiber-optic communication lines	1	5	-	
	EEC 7614	Modern satellite broadband access systems			-	
Elective group - 2	EEC 7603	Methods of Digital signal processing			-	
	EEC 7619	Modern methods of signal conversion			-	
2nd term						
Elective group - 3	EEC 7615	Methods for modeling telecommunication systems and communication networks	2	5	-	
	EEC 7602	Modern technologies of telecommunication networks			-	
Elective group - 4	EEC 7616	Methodology and methods of scientific research			-	
	EEC 7608	Theory and technique of a scientific experiment			EEC 7604	
Profile disciplines						
Elective disciplines						
2nd year						
3rd term						
Elective group - 5	EEC 7609	Embedded systems in ICT	3	5	EEC 7604	
	EEC 7617	Approaches to the development of standards for mobile networks of new generations			-	
Elective group - 6	EEC 7618	Artificial intelligence in telecommunication systems			-	
	EEC 7610	New Generations Network technologies			-	
Elective group - 7	EEC 7620	Space technics and technologies			4	-
	EEC 7621	Features of 6G technologies and services				-

3. DESCRIPTION OF ELECTIVE DISCIPLINES

Description of discipline	
Code of discipline	EEC 7601
Name of discipline	Reliability of fiber-optic communication lines
Number of credits (ESTS)	5
Course, semester	1,1
Department	Radio engineering, electronics and telecommunications
Course author (s)	Kemelbekov B.Zh.
Prerequisites	Guide systems for telecommunications
Postrequisites	Graduate master's work
The aim of study of a discipline	The purpose of this discipline is to study ways to increase the reliability of digital transmission systems, to teach students to the systematic approach of deepening theoretical knowledge. The educational goal of the discipline is the formation of a scientific, creative approach to mastering modern technologies of information systems among students
Brief course description (main sections)	The methodological direction of the discipline presupposes a systematic study of the principles of ways to improve the reliability of fiber-optic transmission systems. The ideological and political orientation of the discipline is determined by the tasks set by the President of the Republic of Kazakhstan in the effective use of the information and telecommunication potential of the country, the fulfillment of the assigned tasks within the established timeframe, using advanced domestic and foreign experience in the field of telecommunications. Lectures are based on a consistent systematic presentation by the teacher of the educational material, each lecture is accompanied by a presentation containing a brief theoretical material and illustrative material. A number of questions are submitted for independent study by the undergraduate under the guidance and supervision of the teacher.
Expected Learning Outcomes (knowledge, abilities, skills and competencies acquired by students)	<ul style="list-style-type: none"> - ability to determine the reliability of fiber-optic transmission systems; - the ability to choose the optimal algorithms for technical operation to predict the reliability of fiber-optic transmission systems; - in perfect use and implement theoretical knowledge in operation.

Description of discipline	
Code of discipline	EEC 7603
Name of discipline	Methods of digital signal processing
Number of credits (ESTS)	5
Course, semester	1, 1

Description of discipline	
Code of discipline	EEC 7609
Name of discipline	Embedded systems in ICT
Number of credits (ESTS)	5
Course, semester	2,3
Department	Radio engineering, electronics and telecommunications
Course author (s)	Dzhaparkulov B.K.
Prerequisites	Computer science
Postrequisites	Mobile communications systems
The aim of study of a discipline	The discipline aims at teaching basic knowledge on the organization of the testing process and debugging of embedded systems using modern technologies and approaches
Brief course description (main sections)	The course discusses the key principles of building embedded systems, provides an overview of embedded operating systems and real-time systems. The architecture of the processor nodes, the hierarchy and memory technology, the structure of interrupt controllers, devices and I / O interfaces of the embedded system are described. The differences between the Android, Linux and Windows CE platforms and the main ways to load the embedded system are described. The principles of organization of embedded systems and the interaction of their components are given.
Expected Learning Outcomes (knowledge, abilities, skills and competencies acquired by students)	As a result of studying the course, students should be able to: <ul style="list-style-type: none"> • Describe the main components of an embedded system. • Distinguish the differences between the Android, Linux, and Windows CE platforms. • Identify the main methods for loading the embedded system. • own the principles of design and development of embedded systems. • Explain the principle of debugging software used in embedded systems

Description of discipline	
Code of discipline	EEC 7602
Name of discipline	Modern technologies of information security of telecommunication networks
Number of credits (ESTS)	5
Course, semester	1,2
Department	Radio engineering, electronics and telecommunications
Course author (s)	Amanzholova S.T.
Prerequisites	-
Postrequisites	Graduatemaster'swork
The aim of study of a discipline	study of the fundamental principles of information security using cryptographic methods and examples of implementation of these methods in practice
Brief course description (main sections)	<p>The course consists of the following sections:</p> <p>Introduction to cryptology. Symmetric cryptography algorithms Asymmetric cryptography algorithms HASH functions Digital signatures Authentication algorithms</p> <p>Course objective: System approach to the organization of protection of information transmitted and processed by technical means based on the use of cryptographic methods. Principles of synthesis and analysis of ciphers, mathematical methods used in cryptanalysis.</p>
Expected Learning Outcomes (knowledge, abilities, skills and competencies acquired by students)	<p>As a result, undergraduates are able to:</p> <ul style="list-style-type: none"> - Be able to use existing cryptographic systems; - Know the principles of encryption and decryption of information; - To understand the methods of cryptanalysis - Implement existing information security solutions in existing telecommunications systems - Implement new information security technologies in telecommunications systems - Conduct system security analysis

Description of discipline	
Code of discipline	EEC 7610
Name of discipline	New Generation Network Technologies
Number of credits (ESTS)	5
Course, semester	2, 3
Department	Radio engineering, electronics and telecommunications
Course author (s)	Bakhtiyarova Y.A.
Prerequisites	Reliability of fiber-optic communication lines
Postrequisites	Modern methods and prospects for using the radio Frequency spectrum, Problems of electromagnetic compatibility of Frequency spectrum
The aim of study of a discipline	it consists in mastering the principles of building architectures and working principles of modern and advanced network technologies for various purposes, the basics of their design, management methods and network analysis
Brief course description (main sections)	it provides for the study of the principles of modern technologies, computer network architectures, and network management system architectures.
Expected Learning Outcomes (knowledge, abilities, skills and competencies acquired by students)	<p>know:</p> <ul style="list-style-type: none"> - about the architecture of computer networks; - about problems and prospects of development of network technologies, protocols and operating systems. <p>know:</p> <ul style="list-style-type: none"> - architecture of computer networks, - basic and high-speed local area network technologies, global networks; - routing protocol; - basics of Internet technology. <p>be able to:</p> <ul style="list-style-type: none"> - perform administration in networks; - evaluate and analyze the results obtained. - apply the acquired knowledge in practice. - be competent in modern issues of design of radio engineering devices.